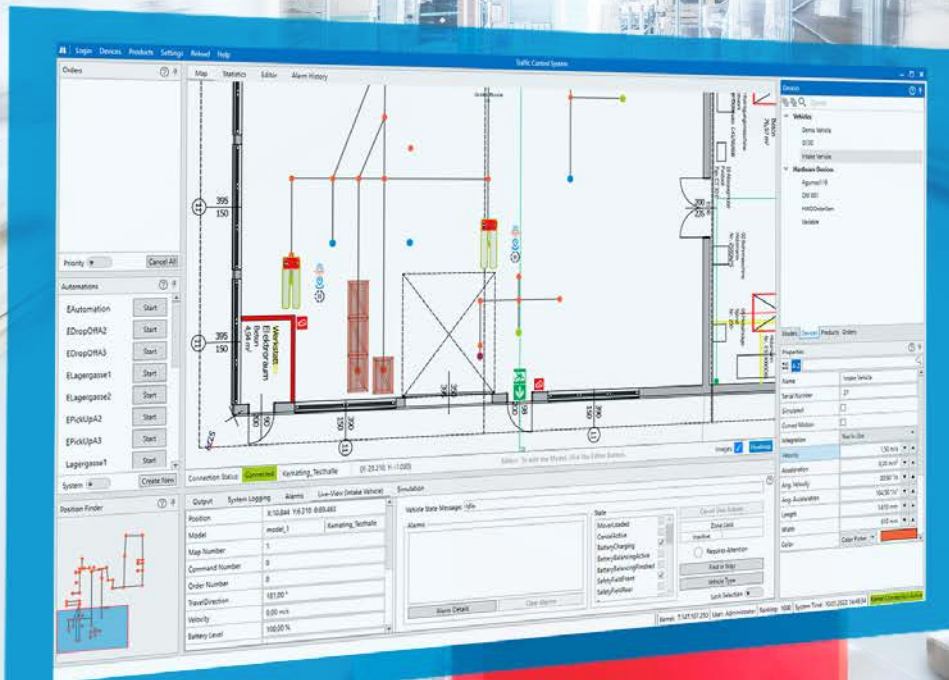


# TRAFFIC CONTROL SYSTEM FOR AGV



## HOT FACTS

### GRAPHICAL SYSTEM EDITOR

Simple route creation and efficient route planning

### SLAM INTEGRATION

Direct integration of SLAM cards

### ORDER SIMULATOR

Optimize travel orders with integrated fleet simulation – in real time and time-lapse

### FLEXIBLE DATA INTERFACE

System integration with standard protocols VDA 5050, MQTT, JSON, UDP, TCP/IP, etc. – remote access from anywhere



## TRAFFIC CONTROL SYSTEM

# REAL-TIME SOFTWARE FOR AVG & AMR

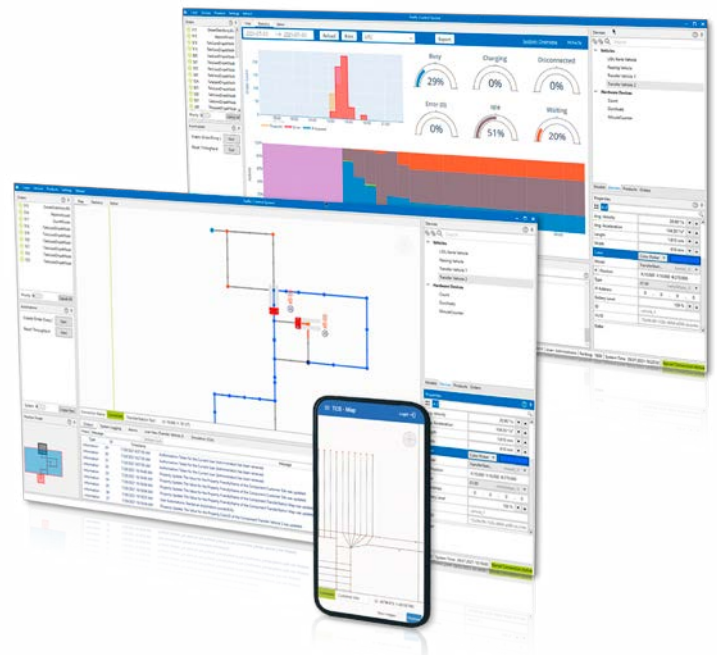
The TCS (Traffic Control System) from SIGMATEK is an open AVG fleet management system that operates independently of the vehicle manufacturer and uses standardized interfaces for communication between the vehicle and master control. This allows the integration of AMRs from different manufacturers. The TCS performs the route planning and considers all possible routes, one-ways, permanent or temporary obstacles or user-definable restrictions. Much like a taxi dispatcher, the guidance system sends an available vehicle to the pick-up point and then to the delivery address. SIGMATEK's TCS is easily integrated into merchandise- and warehouse management systems, as well as automation solutions, but can also be used completely independently of them.

## SAFETY SIMULATION & ANALYSIS

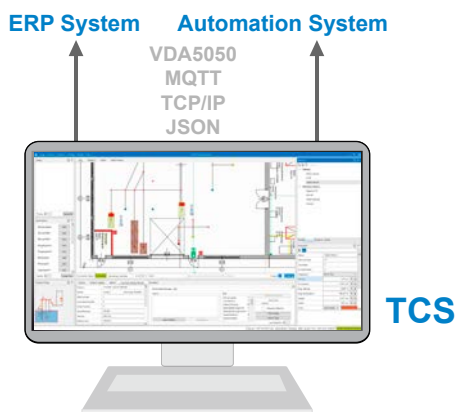
The SIGMATEK TCS provides the ability to test processes in the computer simulation. This simulation is run up to 720 times faster than the real process. An entire day can therefore be completely mapped in two minutes. The web-based visualization can also be used with mobile end devices. During active operation, all vehicle movements are shown in real time, with location, the direction of travel and speed, as well as the battery charge of the individual vehicles. Heat maps allow conclusions to be drawn regarding traffic jams and other traffic conditions. An efficient analysis module immediately enables troubleshooting.

## CONTINUOUS ADAPTATION TO REALITY

Hall plans don't always match reality and only represent empty spaces without installations, furniture or movable objects. SIGMATEK therefore provides TCS the option of importing real data, so that the map can be adapted to the actual conditions. These can be recorded by AMRs during navigation using the contour-guided SLAM method (Simultaneous Localization and Mapping). For this purpose, SIGMATEK has developed the real-time locating software SlamLoc.



Informative analysis tools. Fleet efficiency at a glance – graphic al heat maps and comprehensive statistical data analysis



### TCS SOFTWARE

Various packages available (starting Q1/2023)

# SLAM NAVIGATION FOR AGV & AMR



## HOT FACTS

### UNCOMPROMISINGLY PRECISE

Continuous adaptation to reality and highly accurate determination of the pose

### POCKETLIGHT MODE

Reliable navigation in dynamic and unexplored card areas

### SLAMCLIENT

Visualization of routes and dynamic mapping

## SLAMLOC SOFTWARE

# REAL-TIME FOR AVG & AMR

SIGMATEK's SlamLoc is a real-time localization software that revolutionizes the way AVGs and AMRs handle changes in their environment with contour-based navigation.

Automated guided vehicles perform their navigation tasks on-board, mostly following defined routes. The vehicles continually check the route using various navigation methods, as hall plans often do not match reality and are constantly changing. The TCS fleet management system from SIGMATEK provides the option to import real data, so the map can be adapted to the actual conditions.

## UNCOMPROMISINGLY PRECISE NAVIGATION

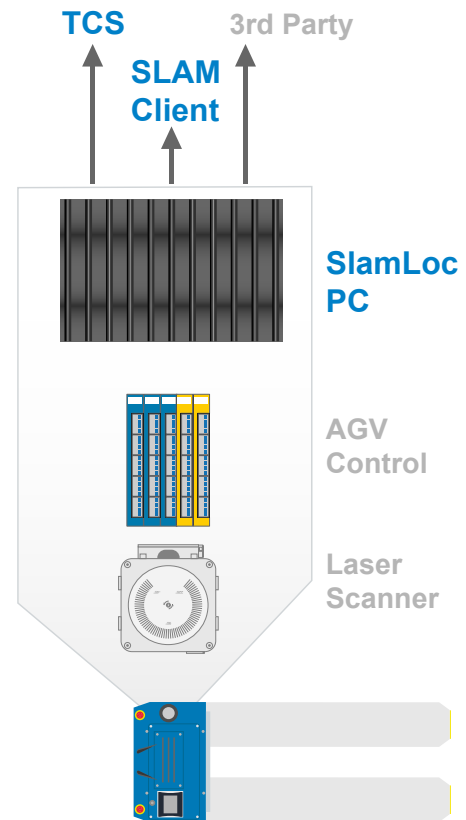
The real-time localization software SlamLoc revolutionizes the way AMRs handle changes in their environment using contour-based navigation. SlamLoc creates the map of the environment as a basis for route planning during the initial teaching cycle. If a "foreign object" is detected during further runs, is taken into account and is used for position determining. The pose, i.e. the X/Y coordinates, as well as the direction in which the vehicle is oriented, can thereby be determined much more accurately as this would be possible by simply extrapolating the drive data.

## CONTINUOUS ADAPTATION TO REALITY

SIGMATEK SlamLoc enables uncompromisingly precise, contour-based navigation – even if the view of known contours is obstructed for example, by pallet stacks. Real-time SLAM enables the exact localization of vehicles during restart without time-consuming initialization. Above all, the software allows fully dynamic navigation in areas that are subject to significant changes. In the so-called PocketLight mode, temporary, possibly moving objects slowly come into view when approached and disappear just as slowly after passing. Normally, they are not added to the static card. By deliberately avoiding the use of familiar contours, SlamLoc allows buffer zones, goods receiving or shipping to be integrated into an AGV for the first time.

## SLAMCLIENT FOR VISUALIZATION

SIGMATEK SlamLoc comes as a pure software solution or preinstalled into a robust, industrial-grade box PC suited for use in vehicles. The optional "SlamClient" enables visualization of the actual vehicle movements and dynamic mapping, as well as its editing.



▲ SIGMATEK SlamLoc can be used as a pure software solution or preinstalled in robust Mini-PC. With SlamClient, the actual vehicle movement can be visualized.

### SLAMLOC & SLAMCLIENT

Various packages available (starting Q1/2023)