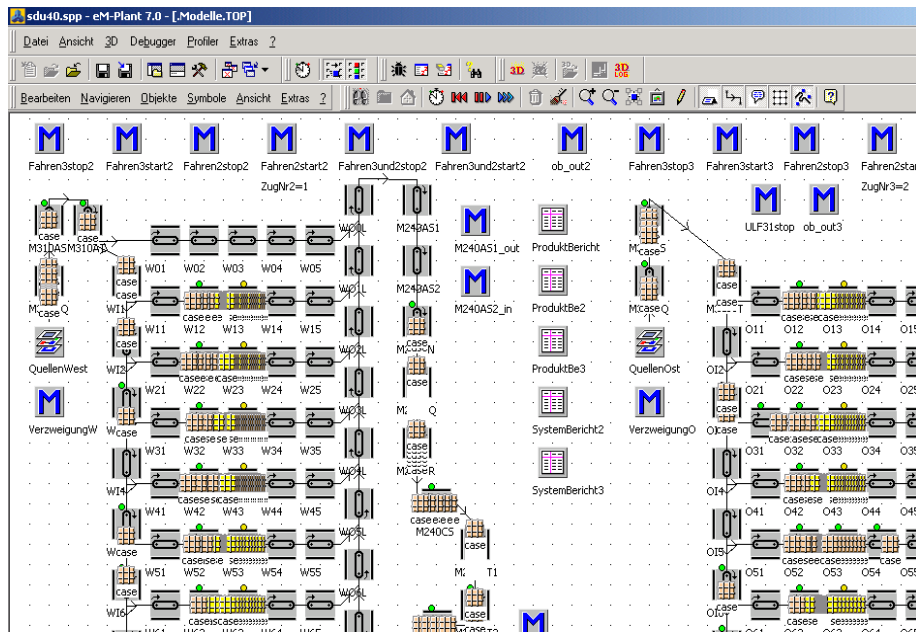


# SIMULATION OF COMPLEX CONVEYER SYSTEM

## Problem definition

The simulation object is a complex conveyor system with which input receiving products in the form of packing units (PUs). The main destination of the conveyor system is the transportation of PUs to automatic machines that put PUs on trays. Simultaneously, up to eight types of PUs can enter the system. A certain quantity of PUs of one type is put on each tray. PUs are divided into types and are accumulated on sorting lines of the systems, and then, in the form of "trains" are transported to the stacker automatic machines.

The specialists operating the conveyor system have come to the opinion that:



- \* it is possible to increase the capacity of each direction of transportation if to change the rules of admission of trains to sectors and to reduce the free space between trains by this;
- \* probability of PU loss in the input flow due to the overflowing of the sorting area will decrease if each train will be arranged in the form of two parts on two neighbouring sorting lines.

The simulation model has been created for testing the effect of the offered changes of the system, and that testing had to be performed with different combinations of types of simultaneously manufactured and transported products.

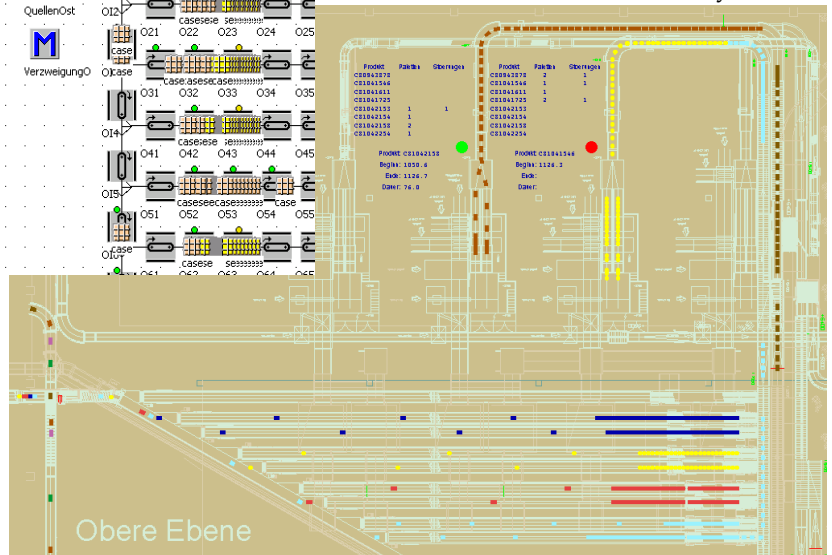
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## Proceeding

The simulation model of the system has been created with the help of eM-Plant package. The numerical results of simulation are reflected in the form of tables and graphs with the help of MS Excel. The animation of the simulated process is performed with the help of Proof Animation package.

The operation of about 240 separate sections of the transporter is reflected in the model. The operation of the PU flows autocontrol system that includes about 40 photo relays, about 30 controlled sections of the transporter and self-operating device, which algorithms

were changing during simulation experiments, is reproduced precisely. During operation of the model, separate events and the primary indices of functioning in the form of PU counters and ready trays in various points of the system for the products of each type are registered. On the basis of these data the indices referring to the delay of ready trains and periods of standby of the technical resources of the system are



calculated.

## Results

The main practical result of simulation is the fact that without changing the composition of the equipment it has become possible to increase the capacity of the system by 20% on the average.

