SimPlan

Digital Twin Software

for flow simulation

EMULATE3D

Simulator

Powered by

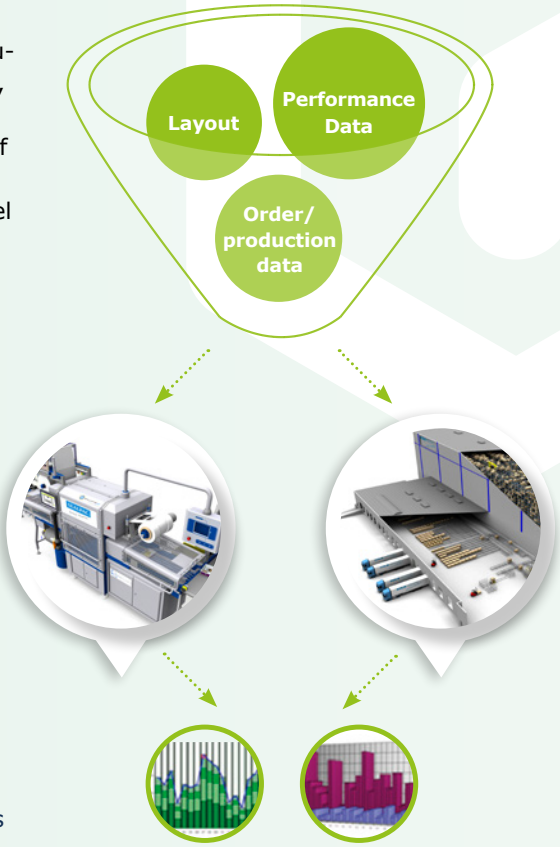
Rockwell Automation

Flow simulation from production to logistics

As a dynamic flow simulation tool, **Emulate3D Simulator** is typically used during the design phase of machines and complete systems to validate the concept. The software allows the simulation of systems in their entirety and, if required, with stochastic elements such as availability. The significance of the results therefore goes far beyond static analytical methods such as Excel calculations.

Typical results from simulations are:

- System performance (output)
- Overall availability of the system (OEE)
- Utilisation of system components:
  - → Machines
  - → Robots
  - → Automated Guided Vehicles (AGV)
  - → Industrial trucks
  - → Stacker Cranes
- Necessary buffer sizes (e.g. decoupling buffer in the production area)
- Bottlenecks in the material flow
- Required number of vehicles, pucks (e.g. for AGV systems, electric monorail systems, MagneMover)
- Findings from What-if-studies



Picture: Methodology of flow simulation

Basic features

Emulate3D Simulator provides a comprehensive range of libraries of components with properties to assist users in setting up their simulation models. The standard libraries include for example:

- Smart Conveyors" for conveyor
- systems
- "Robots" for articulated, delta and scara robots
- "QuickLogic Racks" for any type
- of storage technology
- "Vehicles" for industrial trucks,
- overhead conveyor technology,
- automated guided vehicles
- "AMRs" for autonomous mobile
- robots
- "ICT" for Rockwell independent cart
- technology (MagneMotion)

MagneMover® is an intelligent and cost-effective conveyor system from Rockwell Automation, designed tomove light loads quickly and efficiently. For the simulation of these systems, **Emulate3D Simulator** provides a catalog that allows systems to be quickly modelled and simulated.

Picture: Simulation model of a tyre assembly, -sorting and buffering system

Use of 3D-CAD - "CAD Is The Model" module: For the simulation of machines and handling equipment, it can be necessary and useful to create models based on 3D design data, for which **Emulate3D Simulator** provides a variety of import interfaces. Once imported, the data is marked up using the "CAD Is The Model" module, this means the individual motion axes and joints are imprinted in order to obtain components that can be used for simulations. Native CAD interfaces are currently available for AutoCAD, Creo Parametric, Inventor, NX, Onshape, Sketchup, Solid- Works and Solid Edge. Other formats can be imported via STEP or VRML.

Picture: Emulate3D Simulator enables the connection of robot simulators

Flow control: All standard components have a built-in and customisable flow control. Machines or robots can be controlled by an internal **Emulate3D** controller.

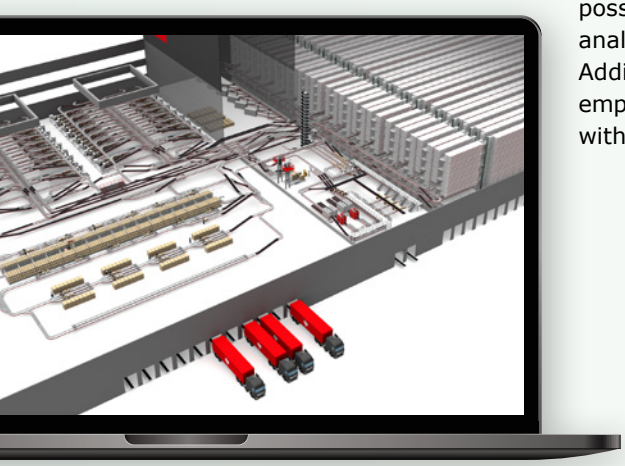
For robots, it is also possible to have the axis positions controlled by a connected robot simulator or control emulator to simulate real trajectory. Standard interfaces to Fanuc Roboguide, Omron ACE, ABB Robotstudio and Yaskawa MotoSim are available for this purpose.

Input data: For valid simulation results, a large number of input parameters (speeds, cycle times, job data, etc.) must usually be entered. These can be entered either directly in the simulation components or centrally in table structures. If required, data can also be read at runtime from databases, for which an ODBC interface is available, for example.

Picture: The Simanalyser module enables the assessment and visualisation of results data.

Experiments and reports: The Experiment Manager is available for automated execution of simulation runs and for finding optima. It allows you to create a series of experiments that will be run automatically.

The individual simulation runs are started in parallel and distributed across the available CPU cores in order to obtain the results as quickly as possible. The results data is visualised by the Analysis module, which displays typical metrics such as throughput, utilisation etc. in bar, line and pie charts. However, it is also possible to export the raw data and analyse it in Excel or other tools. Additionally, metaheuristics can be employed to identify optimal solutions within a given space.



Advanced features

Emulate3D Simulator can be customised and expanded in many places. These can be, for example, specific components, automatisms or connections from/to external systems. **Emulate3D Simulator** offers the possibility to integrate and debug C# scripts from Visual Studio and Visual Studio Code. **Emulate3D Simulator** thus becomes a flexible development framework that can be used to implement a wide range of different and even exotic solutions.

Emulate3D Editions

In the event that **Emulate3D Demonstrator** models have already been created in previous project phases, they can be developed into comprehensive simulation models with the assistance of **Emulate3D Simulator**, thereby enabling a significant portion of the work to be transferred.

Extract from the current references

- Accenture
- Bühler AG
- Continental Tyres Germany GmbH
- Dachser Group SE & Co KG
- DHL Sorting Centre GmbH
- Dematic GmbH
- Ehrhardt + Partner GmbH & Co KG
- Fortna
- G. Siempelkamp GmbH & Co KG
- GEBHARDT Fördertechnik GmbH
- Interroll Group
- IWL AG
- Jungheinrich AG
- KHS GmbH
- KNAPP AG
- Körber AG
- Lidl Foundation & Co KG
- Miebach Consulting GmbH
- REWE Markt GmbH
- Schenker Germany AG
- SEW-EURODRIVE GmbH & Co. KG
- SWAN GmbH
- Swisslog GmbH
- TGW LOGISTICS GROUP GmbH
- Vanderlande Industries GmbH
- viastore SYSTEMS GmbH

Our locations

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Do you have any questions about the Emulate3D software?

Please feel free to contact us: info@emulate3d.de

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www.emulate3d.de

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