Plant Simulation Shop

## Modeling, simulating, visualizing and optimizing discrete production systems

Benefits

Improve production system metrics, as validated by experiences of real-world Siemens PLM Software clients:

- Electronics industry project showed 23 percent throughput improvement
- Truck industry project reduced its time for scheduling metrics (which included complex scheduling) from 40 hours to 4 hours
- Major OEM project realized 13 percent throughput reduction
- Tier 1 automotive supplier reduced setup time by more than 60 percent
- Large diesel engine manufacturer saved $70K per year from work-in-process improvements and space reductions
- Client's bottlenecked shop floor increased machine capacity by 10 percent

Summary

Tecnomatix® software's Plant Simulation Shop enables you to model, simulate, visualize and optimize the flow of customer orders through a shop floor production system. Its capabilities can be used by engineers to plan your production system and by your preparation staff and managing clerks to optimize the production plan for daily operation. Users can take advantage of Plant Simulation Shop's object-oriented modeling and modular design techniques to accelerate the creation of your production plan and to improve its performance in terms of throughput, order scheduling, machine utilization, space utilization and predictability.
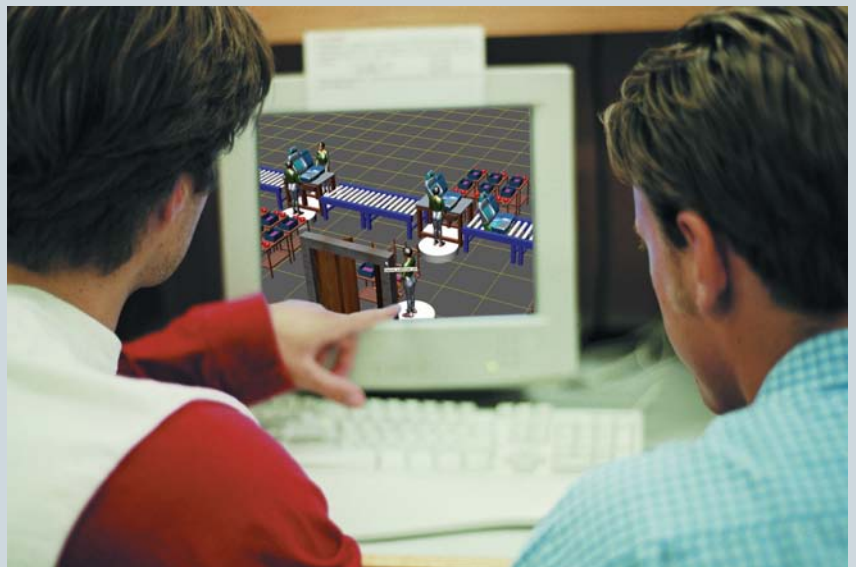
Plant Simulation Shop provides an application object library that you can use to model, simulate, visualize and optimize a production system on an object-oriented basis. By modeling the workshop principles of your production system, you define how production orders are forwarded through production and how you can control the material flow of your production system to improve its daily performance.

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Benefits *continued*

Facilitate other production system improvements, including the ability to:
- Produce more parts in less time
- Balance machine utilization better
- Reduce/eliminate overtime work
- Reduce wait times and thereby reduce the asset in production
- Shorten delivery times and reduce delivery delays
- React to fast changing market demands

Improve production planning by:
- Reducing time required to create the production plan
- Optimizing MRP/ERP (PPS) system parameters
- Optimizing the production sequence

Flexibly optimize the production plan by:
- Examining the product plan and assessing various operational scenarios
- Evaluating well balanced shift models on the basis of resource and work utilization
- Evaluating different production sequences in terms of their throughput per hour and output per day

Two kinds of users are able to take advantage of Plant Simulation Shop:
- Engineers can leverage Plant Simulation Shop's material requirements planning capabilities to create a production plan that is used to schedule customer orders
- Your preparation staff and managing clerks can use Plant Simulation Shop to optimize the production plan on a daily operational basis

Establishing a production plan

Plant Simulation Shop's material requirements planning capabilities enable you to break down the bill of materials and establish production lots for individual components and products. These capabilities allow you to create a forecast of assumed demand that, in turn, will become the basis for your system's production plan.

At this point, you can set up customer orders against the production plan. If real-world conditions arise where actual customer orders exceed your plan orders, you can use Plant Simulation Shop to start your rush orders.

Plant Simulation Shop enables you to establish a forecast table where you can organize your products into appropriate product groups that you manage and monitor. These product groups are exploded into a material requirements plan.

You can manage your production orders with respect to their lot size by generating production orders from the material requirements plan. Stock from production orders that are too big will be offset against later plan orders. There will be no production orders during the planning phase for lot sizes managed in accordance with the Kanban rule. Instead, these lots will be handled through simulation runs.

You can use Plant Simulation Shop for scheduling purposes by displaying single plant orders in easy-to-understand Gantt charts. Plant Simulation Shop uses the rules of production control to manage multiple orders that start at the same time and to decide which order starts first. You can use these controls to process the product order list in sequence, establish individual priorities manually, consider the due dates of individual orders, or use randomized priorities.

Features

- Interactive graphical interface that facilitates the fast display of material and job flow through the use of predefined objects, such as:
  - Planning control stations (master requirements planning and order planning)
  - Production control
  - Processing stations
  - Purchase manager (provider, unit cost prices, delivery times)
  - Warehouse manager (storages, stock)
- Integrated material requirements planning that displays delayed orders
- Integrated objects for evaluating storage fill levels
- Simulation run displays that include resource utilization, product plans, costs and machine occupations presented in dialog boxes, tables and Gantt charts

System requirements

- In order to use Plant Simulation Shop, you must have a license for Plant Simulation Professional, Plant Simulation Standard or Plant Simulation Application.
- The Plant Simulation Runtime license already contains Plant Simulation Shop for usage.

Plant Simulation Shop's support for the rules of production control and process sequencing enable you to account for a variety of factors such as first suitable, longest/shortest waiting time, longest/shortest operation time, longest/shortest completion time and time of delivery – along with other order-related variables.

In addition, you can use Plant Simulation Shop to analyze and calculate production and product costs. When you use Plant Simulation Shop to apply cost calculations to a specific cost center, you define the cost per hour and price for an external product in the system's master data table.

Optimizing your production plan

Once you understand the particulars that apply to a given customer order, you can use Plant Simulation Shop to create a production plan, whose feasibility you can subsequently check and validate from a real-world perspective.

During this optimization process, you can use Plant Simulation Shop to optimize your production planning and control parameters. More specifically, you can:

- Supplement your existing PPS (enterprise resource planning/manufacturing resource planning) systems to optimize their system parameters
- Perform realistic feasibility checks on your production plan
- Evaluate diverse business and manufacturing scenarios
- Precisely plan given task profiles by utilizing current factory-specific operational data