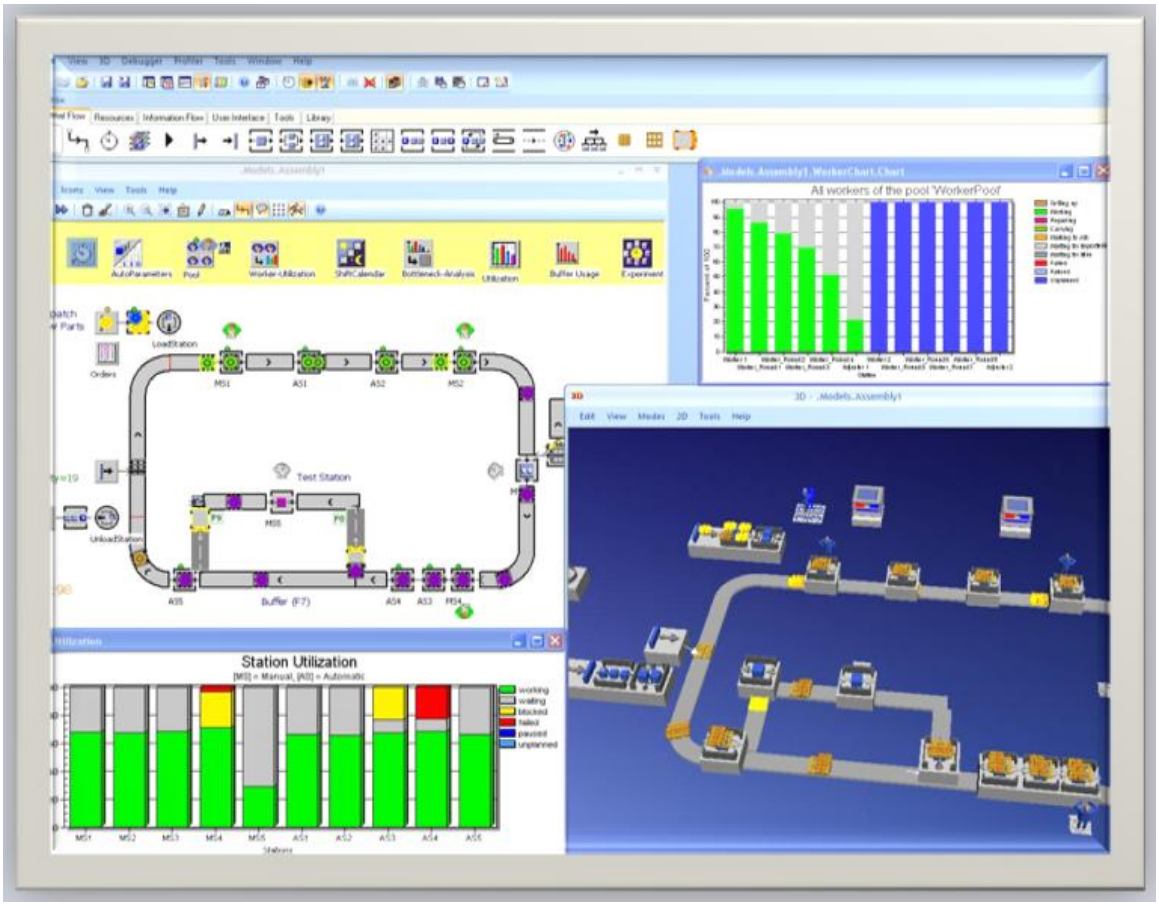
Tecnomatix Plant Simulation

Release Notes

Version 9.0

December 2008



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Tecnomatix Plant Simulation 9.0

The release notes provide a brief overview and description of new functionalities and features introduced with Tecnomatix Plant Simulation version 9.0.

For more detailed descriptions on new and enhanced functionalities in Tecnomatix Plant Simulation 9.0 please use the Tecnomatix Plant Simulation online help.

Besides the numerous functional changes described in the following chapters there are few major changes that we want to point out here:

- Plant Simulation 9.0 can be installed as a true 64-bit program under 64-bit Windows operating systems.
  Please note some additional remarks for the 64-bit version in the chapter *64-bit Version*.
- The 3D visualization has been ported to the common infrastructure used in all Siemens PLM Software 3D applications. Currently existing 3D models cannot be loaded into version 9.0.0 because the 3D model converter could not be finished at time. This feature will be announced and released with one of the next service packs.
  Please review the patch notes released with the service packs accordingly!

New Features in Tecnomatix Plant Simulation 9.0

Tecnomatix Plant Simulation 9.0 provides a number of new and improved features.

- We added new material flow features.
- We modified material flow features.
- We modified and added information flow features.
- We modified and added user interface features.
- We modified and added SimTalk features.
- We modified and added 3D Viewer features
- Miscellany
- 64-bit Version

As the program changed at a number of places, you might have to adapt simulation models you created in previous versions of Tecnomatix Plant Simulation, when you open them in version 9.0!

New Material Flow Features

In *Tecnomatix Plant Simulation* 9.0 we added these features to the material flow objects:

- We added the *PickAndPlace* robot to the material flow objects. It picks a part up at one station and places it onto another station.

  We added the command Calculate Angles to the context menu of the *pick-and-place robot* and of the *Turntable* in the *Frame*.

- We added a feature allowing you to define multiple failures for a machine. For this reason we modified the Tab *Failures*.

- We added the **exit strategy** *MU Attribute* to the material flow objects.

- We added the command *Reorder Successors* to the context menu of objects in the *Frame*.

- We added the command *Edit Frame Display Panel* to the **View** menu of the *Frame*.

- We added the attributes *XPosOrigin3D* and *YPosOrigin3D* to the *Frame*. They set the point on the x-axis and y-axis in the *Frame* in 2D, which will be mapped to the origin of the scene, i.e. the center of the grid in 3D.

- We added a number of functions making modeling with *Connectors* easier (compare *Connect Objects with the Connector*):

- To **exchange the successor** of a *Connector*, select the end point of the *Connector* and drag it to another object.

  To **exchange the predecessor** of a *Connector*, select the starting point of the *Connector* and drag it to another object

- To **place an object**, which you insert from the class library into a *Frame*, **in between two already connected objects**, drag that object onto that spot of the *Connector* and drop it there. In this process *Plant Simulation* exchanges the successor of the original *Connector*.

- To **automatically connect predecessor and successor when deleting an object** located between other connected objects, hold down the **Ctrl** key while you delete the object.

- We added the *Tab Exit Strategy* to the *Store*.

- We added the list box *MU distance type* and the attribute *MUDistanceType* to the *Line* to model a *no-gap conveyor*.

- We added an optional argument to the method *getRouteLength* of the *Track* for route weighting.

- We added the text box *Route weighting* to the *Transporter*, which sets the factor that *Automatic routing* uses to determine on which route the *Transporter* drives to its destination.

  We added the attribute *RouteWeightingAttr* to the *Transporter*.

- We added the feature *Start delay duration* to the *Transporter*. To facilitate this, we added the event **StartTransporter** to the *List of Scheduled Events*.

- We extended the functionality of the *Transporter*. You can now also enter a list or a table as the *Destination*. This list or table can be a *CardFile*, a *QueueFile*, a *StackFile*, or a *TableFile*, which you inserted into a *Frame*. It can also be a user-defined attribute or a *Variable* of type *table*, *list*, *queue*, or *stack*. The list or table has to have the column type *object*. The *Transporter* then covers all destination objects in the list or table one after the other.

  To facilitate this, we added the method *DestinationListRow*.

- We added the button *Debug* to the *Dialog of the Event Debugger*.

- We added a feature which executes a *Method*, which expects a single argument of type *object* with this object as argument when you drag this object onto the *Method* and drop it there.

Modified Material Flow Features

In *Tecnomatix Plant Simulation* 9.0 we modified these features of the material flow objects:

- We changed the definition of *Resource Statistics*. **Setting-up** is now treated as an exclusive state for statistics purposes. Thus the states *Setting-Up* and *Working*, *Waiting* or *Blocked* do not overlap any more. In case a resource is **setting-up** and **working** at the same time, this resource is in the state **working**. A resource is **blocked**, if it is not paused, not failed, fully occupied, not processing and not setting up. A resource is **waiting**, if it is not paused, not failed, not fully occupied, not processing and not setting up.

  For this reason we also removed the statistics methods *statSetupBlockingPortion*, *statSetupWaitingPortion*, and *statSetUpWorkingPortion*.
  We added the **sort criterion > setting-up** to the *Statistics Wizard*.
  We added state **Setting-up** to the values which the Chart shows.

- We changed the definition of **working** of the *Turntable*: It now also is working, when it rotates, not matter if it moves a part or not. Before it was only working, when it moved a part.

- We changed the behavior of the *Turntable*: Until now the *Turntable* determined an angle from the layout in the *Frame*, when an object was not present in the respective angle table. From now on the *Turntable* checks the **Exit Angle Table** for an entering part or the **Entry Angle Table** for an exiting part, if the object is present there and uses that angle. If the object is not contained in the respective table, the *Turntable* uses the angle from the layout.

- We changed the layout of the *Tab Failures* for allowing you to define multiple failures/downtimes of machines.

- We changed *Resource Statistics*: It does not increment the **frequency** of waiting and blocking times any more, when the time is 0. This effects the results of the **mean value** of the *Waiting Time* and the *Blocked Time*.

- We changed the state of the *Assembly* station from **blocked** to **waiting**, when it is waiting for mounting parts.

- We changed how *Plant Simulation* counts the **waiting time** for an *Importer*. It now is always part of the waiting time.

- We changed how *Plant Simulation* moves MUs to the length-oriented objects, such as *Line* and *Track*, etc. A part cannot be moved onto the exact same position on which a part is already located.

- We activated the feature **Set-Up > Only when empty** for the *ParallelProc* as the default setting.

- We changed the layout of the *Tab Importer*.

- We do not support these statistics methods of the material flow objects any more: *statBlockingExpCount*, *statBlockingExpDelta*, *statBlockingExpMu*, *statBlockingExpPortion*, *statBlockingExpTime*, *statWaitingExpCount*, *statWaitingExpDelta*, *statWaitingExpMu*, *statWaitingExpPortion*, and *statWaitingExpTime*.

- We changed how *Plant Simulation* calculates the next animation event for the *Line*. In previous versions it calculated it from the current position, now it calculates it like the *Track* does.

- We changed how *Plant Simulation* processes the *Exit Blocking List*. The **Out** events of the MUs are now being processed in the same order as they were entered into the **exit blocking list**. This mainly effects the *ParallelProc*.

- We changed how *Plant Simulation* handles blocking lists in connection with MUs on MUs:

    - If an MU attempts without avail to move onto a *Transporter*, a *Container*, or a *Worker*, *Plant Simulation* only enters this MU into the blocking list, when the target does not move.

    - If an MU attempts without avail to move from a *Transporter*, a *Container*, or a *Worker*, *Plant Simulation* only enters this MU into the blocking list, when the target does not move.

    - When the *Transporter*, the *Container*, or the *Worker* moves on, because its speed changes or because it is moved,, *Plant Simulation* removes MUs, which wanted to move off the object, and MUs, which wanted to move onto the objects from the blocking lists. This prevents an MU to jump onto a *Transporter*, a *Container*, or a *Worker* or from a *Transporter*, a *Container*, or a *Worker* at a later point in time.

- We made the *Segments* table of the length-oriented objects editable.

- In previous versions *Plant Simulation* did not enter an MU, whose attempt to move from the *Store* to another object failed, into the blocking list of the target object. *Plant Simulation* 9 does enter the MU into the blocking list and thus ensures that the MU will MU moved using the standard transfer mechanism as soon as the target object can receive it.

- We do not support the methods *continue* and *stop* of the *Transporter* any more. You can use the attribute *Stopped* instead. It does not matter if the *Transporter* is driving on a *Track* or on a *Line*.

- We changed the name of the text box **Final speed** of the *Transporter* and of the *Line* to *Speed*.
- We changed the name of the text box **Speed** of the *Transporter* and of the *Line* to *Current speed*

In Tecnomatix Plant Simulation 9.0 we modified these features of the resource objects:

- We added two sections for the **service statistics** of the *Broker*, *Dwelling Time* and *Mediation Time*, to the *Statistics Report*. You can also use the method serviceStat to return the **service statistics**.
- We added an optional *boolean* argument to the methods globalTestImportFor and localTestImportFor of the *Broker*. This argument sets if all *Workers*/*Exporters* will be listed or if only the actually available *Workers*/*Exporters* will be listed.
- We removed the **Waiting Time Statistics** and the **Blocked Time Statistics** of the *Importer* from the *Statistics Report*, as **waiting for an Importer** now always counts as waiting time.
- We added the method calculateWorkingDuration to the *ShiftCalendar*.

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Information Flow Features

In Tecnomatix Plant Simulation 9.0 we added these features to the information flow objects or modified existing features:

- We removed the method *init* for tables, which we replaced with the method *initialize* starting with version 7.6. For this reason you can now also create a user-defined attribute of type *method* for tables with the name `init`, which can serve as an init control.

User Interface Features

In Tecnomatix Plant Simulation 9.0 we added these features to the user interface objects or modified existing features:

- We added these methods to the *Dialog*: *createButton, createCheckBox, createDropDownListBox, createEditTextBox, createGroupBox, createImage, createListBox, createListView, createMenu, createRadioButton, createStaticTextBox, createTabControl, createTabPage,* and *setGroupID*.
- We renamed the method *setText* of the *Dialog* to setCaption.
- We added a function to select the *Background color* of the *Comment*.
- We added the state **Setting-up** to the values, which the *Chart* shows.
- We added several *Marker type***s** to the *Chart*.
- You can now freely combine *Line style***s** and *Line weight*s of the *Chart*, unless you selected the check box *Display in frame*.
- The fourth argument of the method setLineStyle of the *Chart* is now optional.
- We removed support for the method *reset* of the *Chart*. This way you can now create a user-defined attribute of type *method* and name it `Reset`, which will be called when you click **Reset** in the *EventController*. To reset the values of the *Chart*, you can use the method resetValues.
- We removed support of the *ISA Dialog Manager*.

SimTalk Features

In Tecnomatix Plant Simulation 9.0 we added or modified these SimTalk features:

- We added the function calendarWeek.
- We added the function clearConsole.
- We added the function *F3Dblock3DUpdate*.
- We added the function *is64BitApplication*.
- We added two optional arguments to the function saveModel.
- We added the function num_to_hex.
- We changed how the *Relational* Operators **<==** and **>==** handle strings. In previous versions **<==** was treated the same as **<** or **==**, i.e. the first part of the condition considered upper and lower casing. Starting with version 9 upper and lower casing do not matter for **<==** and **>==** any more.

Example: `"bat" <== "BET"`
Previous behavior: `"bat" <== "BET"`

```
<=> "bat" < "BET" or "bat" == "BET"
<=> "bat" < "BET" or toLower("bat") = toLower("BET")
<=> "bat" < "BET" or "bat" = "bet"
<=> false or false
<=> false
```

New behavior: `"bat" <== "BET"`

```
<=> toLower("bat") <= toLower("BET")
<=> "bat" <= "bet"
<=> true
```

- We do not support the function *openURLInMainWindow* any longer.

3D Viewer Features

In Tecnomatix Plant Simulation 9.0 we added or changed these features:

We ported the *3D Viewer* to the Siemens PLM software standard *Direct Model* and now also use the common 3D-Engine of all Tecnomatix programs. With *Direct Model* you can exchange data with other applications in .jt format. During this process we removed a number of functions as compared to previous versions, which are not required any more.

- We removed the command **Edit > Flatten Graphic**.
- We removed the command **Edit > Compile Graphic**.
- We removed the command **Edit > Create LODs**.
- We removed the command **Edit > Create Primitive > Text**.
- We removed the command **Edit > Create Primitive > Point Light**.
- We removed the command **Edit > Create Primitive > Directional Light**.
- We removed the command **Edit > Object Editors > Color**. You can use the command **Edit > Appearance > Material** instead.
- We removed the command **Edit > Object Editors > Paint Color**.
- We removed the command **Edit > Object Editors > Texture**.
- We removed the command **Edit > Object Editors > LOD Ranges**.
- We removed the command **Edit > Object Editors > Pruning**.
- We removed the command **Edit > Object Editors > Make Billboard.**
- We removed the command **Edit > Object Editors > Turn Normals**.
- We removed the command **Edit > Object Editors > Make Materials Double-Sided**.
- We removed the command **Edit > Object Editors > Correct Specular Color**.
- We removed the command **Edit > Global Editors > Background Color**. For the time being you cannot set the background color of the 3D scene.
- We removed the command **View > Lights**.
- We removed the command **View > Statistics**.
- We removed the command **View > Axes**.

Please note: As the model format changed, you cannot load 3D models, which you created in previous versions of *Plant Simulation*, into *Plant Simulation* 9 at the moment.

We added these new features:

- We added the *3D Standard* toolbar to the scene window.
- We defined abstract 3D graphics for the built-in objects.
- We added the function *TransformGeometry*.

We made connecting objects in 3D easier. To establish connections with the *Connector*, you can now use the same procedure as in 2D.

Miscellany

In Tecnomatix Plant Simulation 9.0 we added or changed these features:

- We modified the main menus and the toolbars in the program window:
    - We added the menu item *Pack and Go* to the *File Menu*.
    - We added the menu item *Manage Class Library* to the *File Menu*. You can use it to add objects and add-ins to the class library or to delete them from it. It replaces the command **File** > **Add Objects**.
      Plant Simulation shows the icon of a library folder green in the class library
    - We removed the command **Add Objects** from the *File Menu* and replaced it with the command *Manage Class Library*.
    - We completely reorganized the *View Menu*.
- We made the *Window Menu* a menu of its own on the top level in the program window.
- We changed **custom attribute** to **user-defined attribute**.
- We added a setting for selecting the *Libraries directories*, i.e. the application object libraries, which you yourself develop or which you purchase from a third party vendor.
- We added the command *Save Folder As Library* to the context menu of *class library*.
- We added the command *Edit Library Information* to the context menu of *class library*.
- We added the methods *getLibraryInfo* and *setLibraryInfo*, which apply to the folder.
- We added a feature for merging folders. To do so, hold down **Alt** and drag the replacing folder in the *Class Library* onto the folder to be replaced and drop it there. You can also use the method *replace*. *Plant Simulation* then forms the superset of both folders and merges those classes, which are present in both folders.
- We added commands for inserting and removing vertical separator bars between groups of objects in the *Toolbox*, compare Insert a Separator and *Remove the Separator*.
- We added the command *Antithetic Random Numbers* to the **Tools** menu of the *Eventcontroller*.
- We added a feature allowing you to add a color gradient to filled rectangles, compare *Vector Graphics Toolbar*.
- We added a feature enabling you to move vector graphics objects one pixel or one grid unit at a time with the arrow keys in the *Frame*.
- We added a feature enabling you to enlarge vector graphics objects in the *Frame* by holding down **Ctrl** and pressing one of the arrow keys.

- We added a feature enabling you to zoom the contents of the *Frame* by dragging a marquee over an area with the right mouse button.
- We added the commands **Show Memory Usage** and **Show Changed Attributes** to the context menu of the windows **Show Inheritance** and *Show Structure*.
- We added commands to the context menu of the *Console*.
- We added a feature for preventing the user from opening specific objects. When you enter a user-defined attribute of type *method* as the *Open* control, and when this method is encrypted, you cannot open the respective object any longer. Only the **Open control** itself can still open the object.
- We added the method *removeAllObservers*.
- We added a feature allowing you to directly import jt files into the *3D Viewer* with the command *Import 3D Geometry*.
- We added the *Start Options* `/UILanguage:ENU`, `/UILanguage:DEU`, `/UILanguage:JPN`, and `/UILanguage:CHS`.
- We added an upper-case **R** to the icon of the folder, which you designate as a root folder (rootFolder).
- We replaced the text box **Channel ID** on the tab **Communication** of the *Tab User-defined Attributes* of the objects with the check box **Connect to 3D attribute**. We also replaced the corresponding attribute **ChannelID** of the user-defined attributes with the attribute *ConnectTo3D*.
- We renamed the context menu command **Open Statistics Wizard** of the *Chart* in the *Frame* to *Statistics Wizard*.
- We renamed the context menu command **Show/Hide Display Window** of the *Report*, the *Chart*, and the *Plotter* in the *Frame* to *Show*.
- We renamed the command **Edit > Sample Color** to *Pick Color* in the *Icon Editor*.
- We changed when *Plant Simulation* applies changed *Seed Values*. It now applies them immediately and resets all random number streams with the new seed values.
- We added a feature for entering the *Host name* to the *OPC Interface*.
- We added a number of instructional videos covering a number of topics. You find them in the installation folder of *Plant Simulation* in the folder **Help > Videos**.

64-bit Version

Under the 64-bit version of Windows you can decide, if you want to install the 32-bit or the 64-bit version of Plant Simulation 9.0. You can also install both versions one after the other and run both at the same time. Both versions are compatible, meaning you can open and work with models, which you created in one version in the other version and vice versa.

In the 32-bit version of Windows the amount of available memory is limited, so that you cannot create models of arbitrary size. Normally the available memory more than suffices to create even large simulation models though. The 64-bit version does not impose any practical memory limitations. Be aware that these restrictions do apply:

- When you employ the *C Interface* to link a DLL, which you yourself programmed, this DLL has to be compiled for the 32-bit or for the 64-bit version respectively.
- When you employ *ActiveX* to address a COM object, this COM object has to be created for the 32-bit or for the 64-bit version respectively.
- For the object *ODBC* you also need 64-bit drivers for **ODBC** in the 64-bit version of *Plant Simulation*. At present Microsoft does not provide 64-bit drivers for Access, Excel, etc. so that no ODBC drivers for the 64-bit version of *Plant Simulation* are present on your operating system.
- When you create a self extracting model with *Pack and Go* with the 64-bit version, you can only open this model on a 64-bit version of Windows.
- When you create an extremely large simulation model, which requires more than 3 GB memory, you cannot open this model in the 32-bit version.
- Distributed experiments currently cannot be started and controlled from a 64-bit version. But it is possible to run 64-bit simulation clients, if they are controlled from a 32-bit Plant Simulation experiment master.

We added in SimTalk the method *is64BitApplikation().* This method can be used to determine whether Plant Simulation is running as 32-bot or 64-bit version.