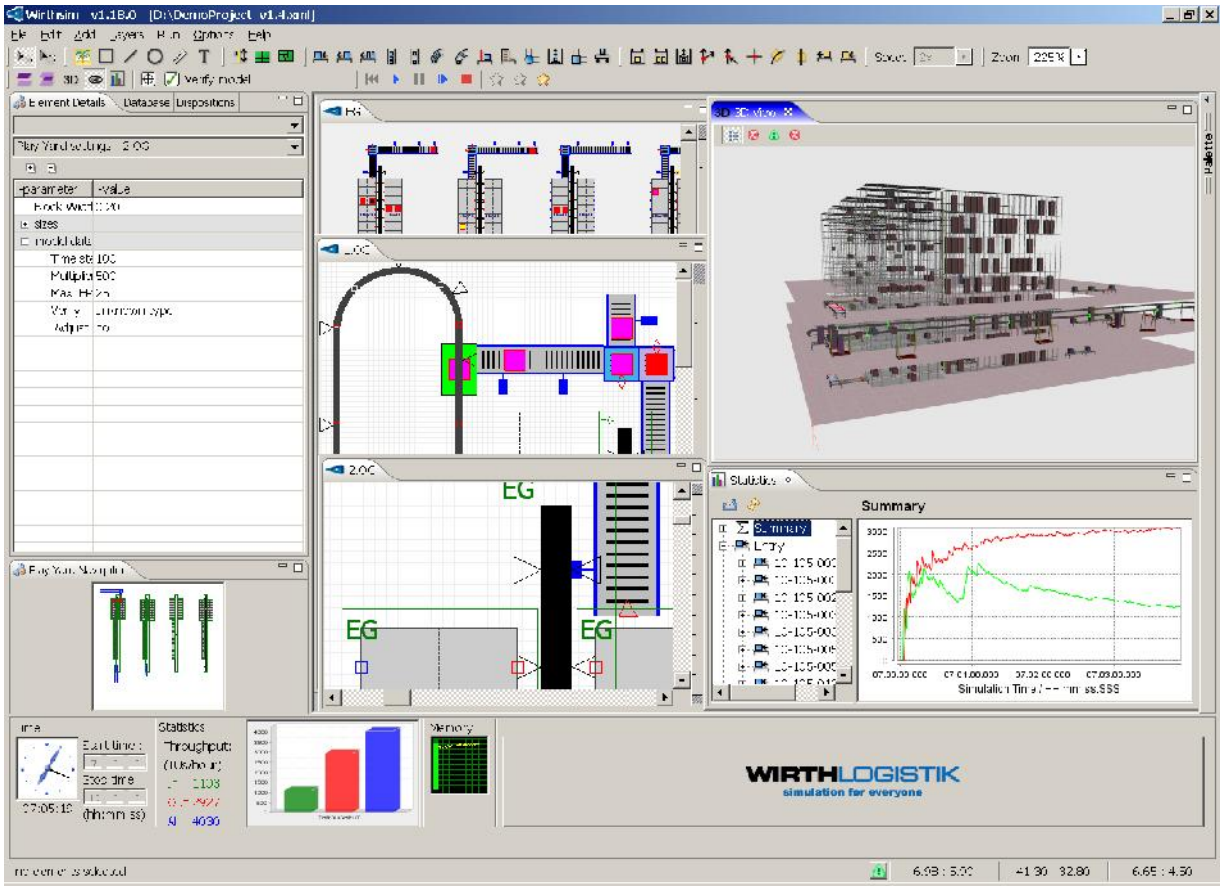
OVERVIEW WIRTHSIM

VERSION V1.4.2 (MAY 2011)

WIRTHSIM Standard
simulate – don't estimate

WIRTHSIM Professional
embedded simulation



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Contents

1 Overview WirthSim™ Standard

WirthSim™ Standard is a unique application for the simulation of automated material flow systems. The WirthSim™ Standard, which is freeware, lets everyone create powerful material flow simulations without requiring any software skills. WirthSim™ Standard is a very efficient application for fast prototyping during sales phase and can be very detailed during the engineering process of a project. The user interface is very intuitive, which makes the creation of complex layouts very simple. Elements are selected from the menu bar and are placed on the simulation layout. No definition is necessary. The basic functionalities and capabilities are:

WirthSim offers two world novelties:

Eco-Sim

WirthSim allows new to create the system simulation under consideration of ecological aspects. All elements in the simulation include now the energy consumption of the drives and an indicator of its operating status On / Off. The consideration of the inclusion in the overall throughput in the design of systems leads to a reduced power consumption. The cost per kW/h are in WirthSim centrally collected and extrapolated to one year of operation and are visualized.

Audio-Sim

WirthSim supports to hear the logistic plant in the 3D environment by surround quality. The speakers are individually controlled based on the user viewpoint (angle), distance to the elements and the element base audio level (high bay stacker cranes are louder then conveyor elements). It allows to consider noise sources especially within areas where human working.

1.1 WirthSim™ Standard Details

Supported operating systems	Windows Prof., XP, Vista, Windows 7 (32/64 Bit)
General	Development in 2D, view in 2D/3D and statistics
Element libraries	Conveyor library unlimited, max. one stacker crane and two racks
Application languages	English, German, Chinese and Russian
Handling (sim. run)	Start, Stop and Step modes supported
Quick-motion	Up to 100 times faster then real speed *[1]
Elements	Unlimited number of elements *[1]
Stopping elements	TUs may be stopped on conveyor elements (simulation of error cases)
Levels	n levels
Recording movies	Recording of movies in the 3D view
Time settings / depending	Transport orders are based on time (00:00 - 23:59)
Interfaces	Settings and transport orders can be saved and loaded from MS-Excel sheets.
2D Images	2D Images may be used as texture for transport units in 3D view or static elements used such as background plans… Supported formats are *.jpg, *.gif, *.png, *.bmp oder *.ico
3D Images	Formats of *.3ds and *.ac (AC3D) may be imported and used as transport unit (3D view) or static images (3D view)
Eco-Sim	Defining and recording of energy consumption
Audio-Sim	Audiovisual layout presentation within the 3D area
Printing	Statistics and layouts
Installation	Automatically inst. of Java / Java3D and WirthSim™

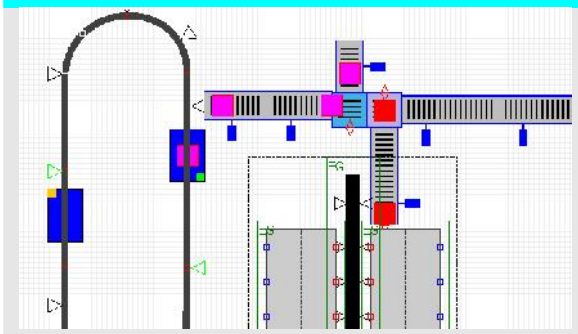
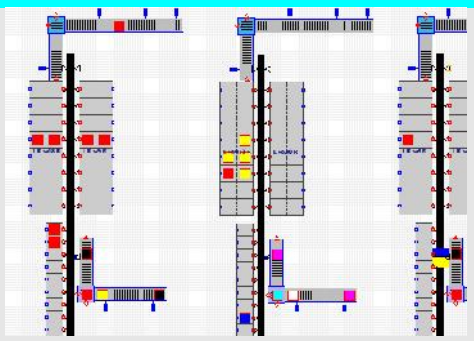
*[1] Depends strongly on computer performance. WirthSim™ is a high performance application, which requires appropriate hardware. Minimum requirement for a small layout is a Pentium 4 processor or equivalent (AMD). For mid to large sized layouts, at least a Dual Core (Pentium / AMD) is required. If the layout is to be viewed in 3D, at least an ATI compatible graphics card with at least 16MB becomes necessary. WirthLogistik GmbH recommends a Dual Core Pro Processor and an ATI compatible graphics card with at least 256MB Memory computer configuration.

2 Overview WirthSim™ Professional

WirthSim™ Professional is far more than “just” a simulation engine. With WirthSim™ Professional is possible to reuse complex disposition software later on in a productive system. This is achieved by a database interface to MySQL, MS SQL Server and Oracle. The rules of a productive system can be written in any language (.NET, Java, Oracle PLSQL…). It just has to send its commands through database tables to WirthSim™. That reduces costs drastically and avoids misunderstandings. The Database Interface is well documented and easy to use.
All functionalities of WirthSim™ Standard are also available in the professional version. The overview below shows the additional possibilities provided by WirthSim™ Professional:

Element libraries	Extended conveyor, crane, rack and monorail library
Complex disposition rules	Database link or through Wirthsim™ Java APIs
Emulation	Through Database link
Protection	WirthSim™ Professional requires an USB dongle per computer (available from WirthLogistik GmbH).

3 Drawing Layouts in 2D

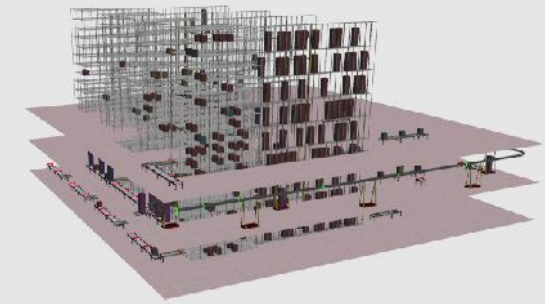
Overview first floor	Details second floor
	

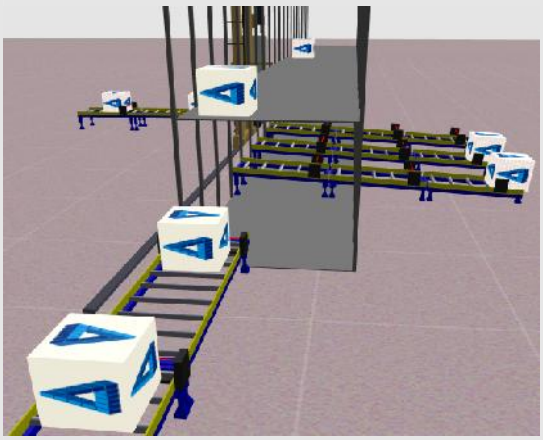
The layout of a WirthSim™ simulation is built within a 2-dimensional environment. Elements like conveyors can be selected from the menu bar and be placed on a layout (grid). Each element contains "sticky" points, which connect to those of other elements. As soon as two "sticky" points get close enough to each other, the elements connect automatically.

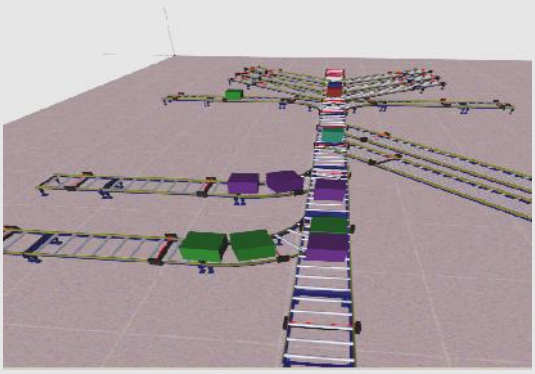
A "height selector" lets the user hide / display certain element heights. This gives the user the possibility not only to draw elements on different heights, but also to place elements on top of each other.

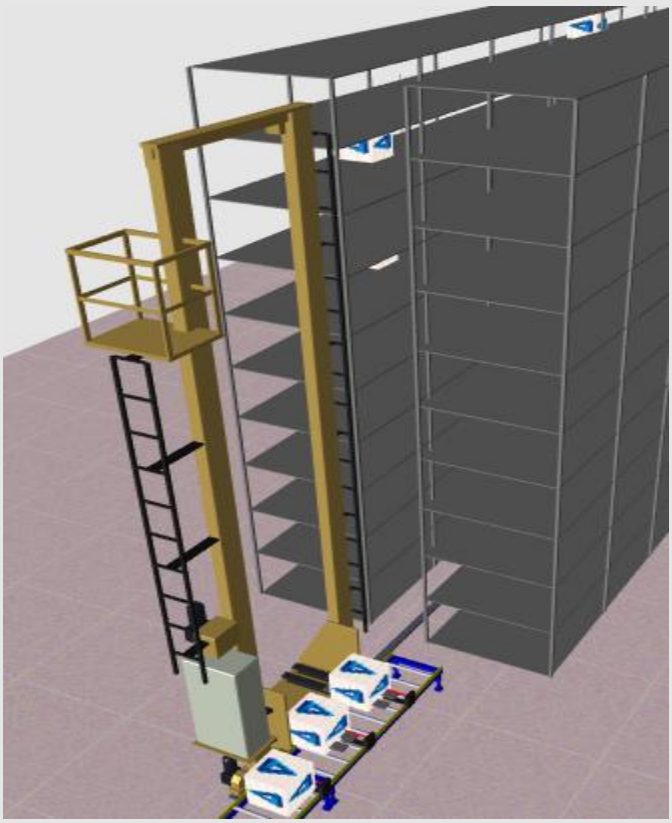
4 View Layouts in 3D

3D View System over several levels	3D Sicht Stacker Cranes & Shuttle system



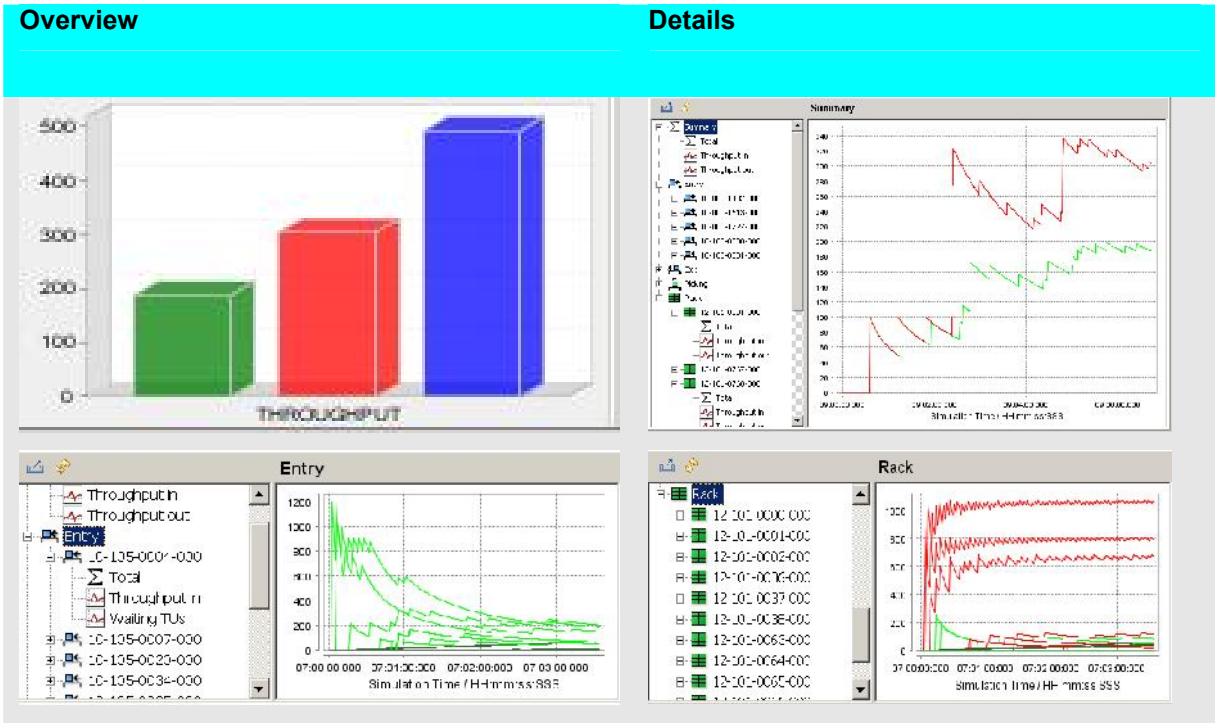






In addition to the development in a 2-dimensional view, it is also possible to visualize the simulation layout as an interactive 3-dimensional projection. The user may walk through the virtual simulation landscape and thus gets a better, more realistic overview of the layout / system.

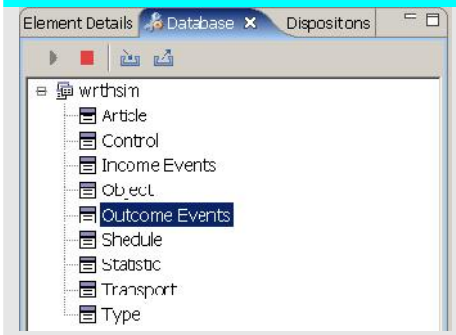
5 Statistics



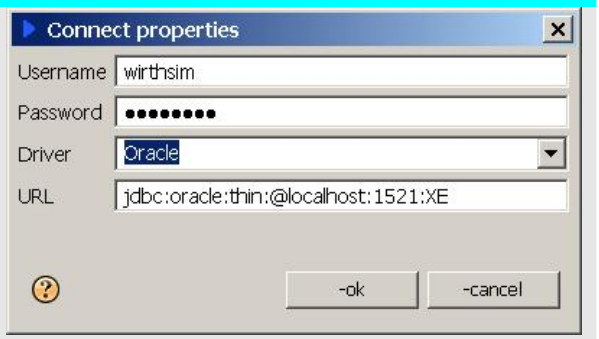
The statistics dialogue allows the user to verify the system performance / throughput of certain elements from one central point. Additionally, is it possible to export the collected data to Microsoft Excel format. Furthermore, hardcopies of certain statistics data may be made.

6 Disposition and Emulation

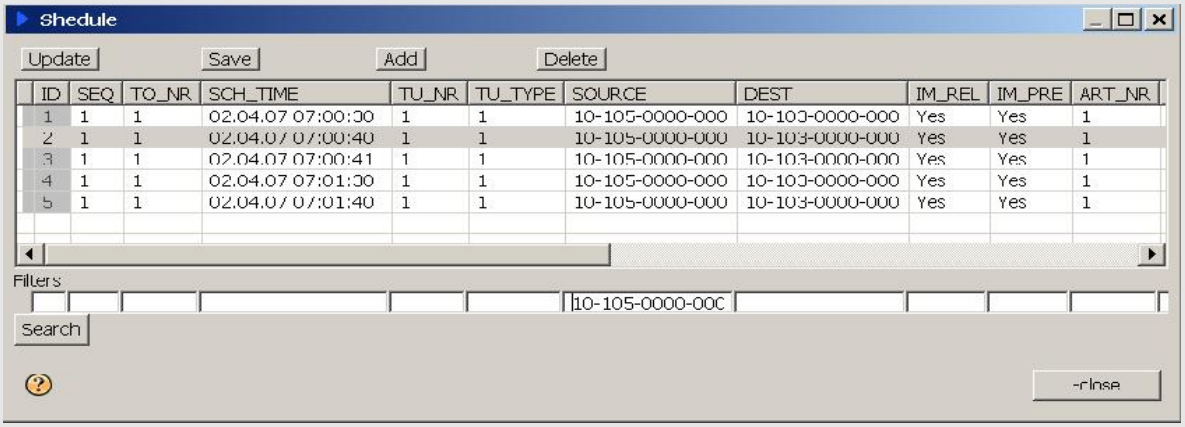
WirthSim database tables



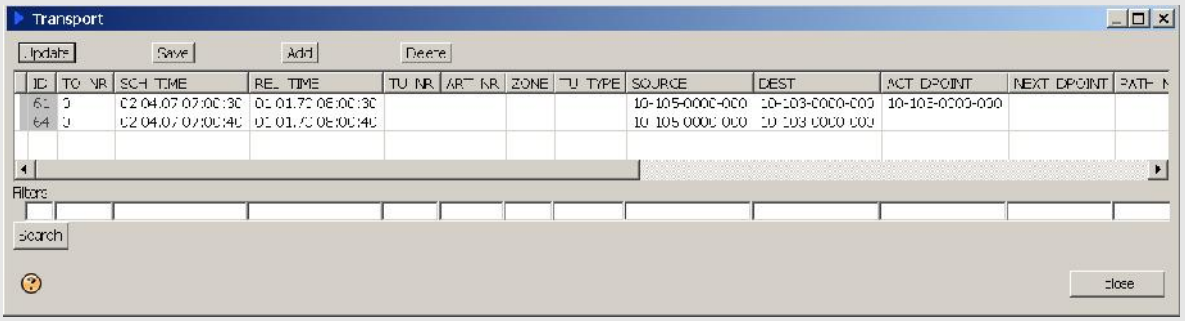
Connect, Schedule and transport Dialogue



Scheduled transport orders



Active transport orders. First one is waiting for a new target



Handling within an Oracle environment

```
INSERT INTO WS_EVENT_IN_T ( ID, TIMESTAMP, CHANGED_ID, UPDATE_TYPE, TABLE_NAME, COMMITTED,
PROCESS_NAME ) VALUES (
1, TO_DATE( '04/02/2007 12:00:00 AM', 'MM/DD/YYYY HH:MI:SS AM'), 1, 'I', 'WS_SCHED_T'
, 'Y', 'SecondTestWithOracleTransport.xml');

INSERT INTO WS_SCHED_T ( ID, SEQ, TO_NR, SCH_TIME, TU_NR, TU_TYPE, SOURCE, DEST, IM_REL, IM_PRE,
ART_NR, ZONE, AUX1_SL, AUX2_SL, AUX3_SL, AUX4_SL, AUX5_SL, PROCESS_NAME, TIMESTAMP ) VALUES (
1, 1, 1, TO_DATE( '04/02/2007 07:00:30 AM', 'MM/DD/YYYY HH:MI:SS AM'), '1', '1' , '10-105-0000-000'
, '10-103-0000-000', 'Y', 'Y', 1 , '1', '1', 1 , '1', '1', '1' , 'SecondTestWithOracleTransport.xml', TO_DATE( 04/02/2007 12:00:00

INSERT INTO WS_SCHED_T ( ID, SEQ, TO_NR, SCH_TIME, TU_NR, TU_TYPE, SOURCE, DEST, IM_REL, IM_PRE,
ART_NR, ZONE, AUX1_SL, AUX2_SL, AUX3_SL, AUX4_SL, AUX5_SL, PROCESS_NAME, TIMESTAMP ) VALUES (
2, 1, 1, TO_DATE( '04/02/2007 07:00:40 AM', 'MM/DD/YYYY HH:MI:SS AM'), '1', '1' , '10-105-0000-000'
, '10-103-0000-000', 'Y', 'Y', 1 , '1', '1', 1 , '1', '1', '1' , 'SecondTestWithOracleTransport.xml', TO_DATE( 04/02/2007 12:00:00
```

The WirthSim™ Professional version supports the programming of complex disposition rules. WirthSim™ makes this possible by connecting to a database such as Oracle, MS SQL Server or MySQL. The external program, which contains the rules and logic, send its commands to the WirthSim™ application by using database tables. By using this kind of architecture, the disposition system is not bound to a special language. The very same interface also provides the possibility to emulate a system. This saves a lot of effort and money, since the rules do not have to be defined in a “virtual test system” and then a second time for the real system. The very simple handling of WirthSim™ combined with the emulation dramatically reduces the planning- and realization efforts and minimizes risks.