

**RailSys**

- 5

-9-5

# Developer

- ◆ **GmbH (RMCon) Rail Management Consultants**
- ◆ **March 1999 founded company, are a rail transport management and a software development enterprise**

# RailSys

- ◆ **The timetable and infrastructure management program**
- ◆ **A software system for analysis, planning and optimization of operational procedures and facilities**

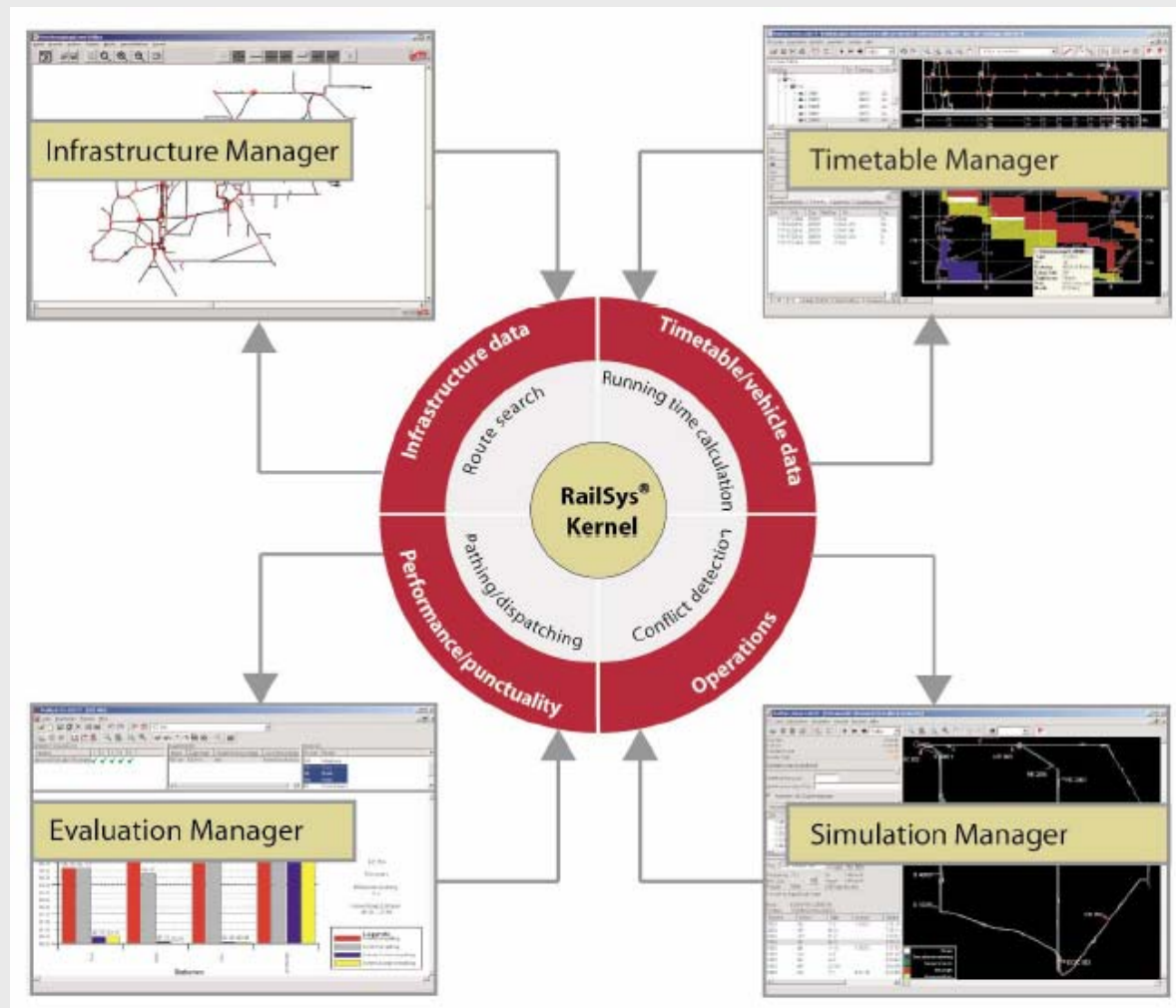
# Applications

- ◆ **Timetable construction**
- ◆ **Running time calculation**
- ◆ **Planning of capacities**
- ◆ **Infrastructure planning**
- ◆ **Validation of nationwide basic interval timetables**
- ◆ **Investigation of operational quality, punctuality and guaranteed connections**

# Database

- ◆ **Exact microscopic display of all data sectors:**
  - Infrastructure
  - Vehicles and train types
  - Timetable and operational data
  - Routing rules

# RailSys Modules



# Infrastructure Manager

- ◆ All data may be entered with an accuracy of one meter.
- ◆ Configuration parameters for every element of track include
  - Length
  - Maximum speed
  - Gradient
  - Curvature/Radius
  - Electrification
  - Tunnel cross-section
  - Superelevation

# Infrastructure Manager

- ◆ Any size of networks
- ◆ Macroscopic display
- ◆ A multitude of modern signaling systems:
  - M/P signalling system including PZB (German automatic train protection)
  - Automatic train control (ATC)
  - Multiple aspect/section signalling
  - Running at sight (e.g. tram)
  - Moving block (running in absolute braking distance)
  - Transfer of signal terms via shortloops and balises (e.g. ATC system Denmark/ETCS)

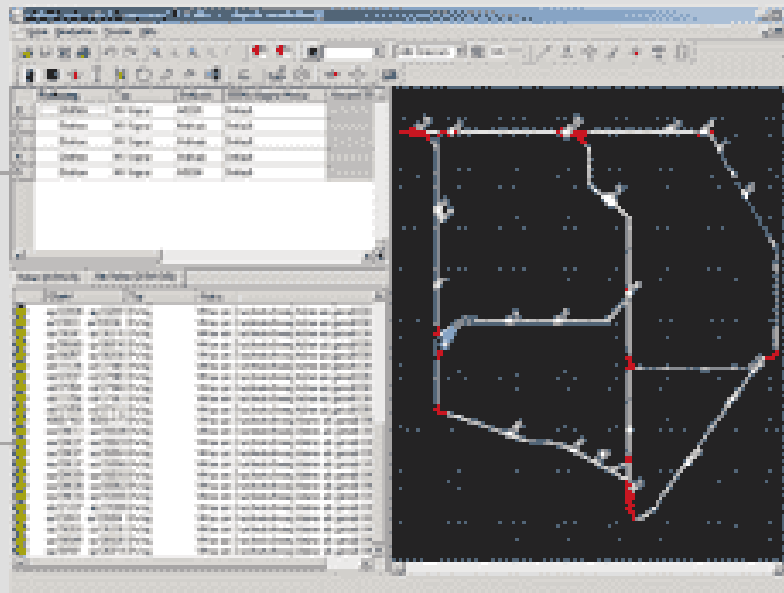


# Infrastructure Manager – Macroscopic Network

*Infrastructure Manager*

*Tabular data  
processing*

*Error list*



*Tool bar*

*Interactive  
graphic window*

# Infrastructure Manager - Microscopic network

The screenshot displays the Infrastructure Manager software interface. The main window shows a complex network diagram with white lines representing connections and red dots representing nodes. The interface includes a menu bar, a toolbar, and a data table.

nr	Länge [m]	Verz. [km/h]	Verz. gegen [km/h]	Nöpfung [s/hc]	Eingelag.
25	4341	11	100	130	15.000
26	4344	25	100	130	15.000
27	4343	0	100	130	15.000
28	4345	100	100	130	4.150
29	4346	0	100	130	4.150
30	4300	200	80	0	-0.010
31	4305	0	100	0	-0.010
32	4370	0	100	0	-0.010

Below the table, there are buttons for 'Neu...' and 'Bearbeiten...'. A 'Fehler' section shows a list of errors with columns for 'Typ' and 'Status'. The error list includes various types such as 'Durchfahrweg der Länge 0', 'Wagen am Durchfahrweg kleiner als gemäß DB AG Regel', and 'Wagen am Durchfahrweg kleiner als gemäß DB AG Regel'.

# Infrastructure Manager - Zoom on microscopic network

The screenshot displays the Infrastructure Manager software interface. The main window shows a microscopic network diagram with a grid background. Red lines represent network paths, and various components like switches and routers are visible. A cyan arrow points to a specific component in the network.

On the left side, there are two panels:

- Routing Table:** A table with columns: Routing, Typ, Endpunkt, and 2000-Modul-Modul.
- Errors List:** A table with columns: Typ and Status.

Routing	Typ	Endpunkt	2000-Modul-Modul
1	Knoten	HY-Signal	TB-3, TB-3, Default

Typ	Status
D-Weg	Durchlaufweg der Länge 0
Block	Enthält einen Anzeiger, der zu nah am Signal steht
Block	Enthält einen Anzeiger, der zu nah am Signal steht
Block	Enthält einen Anzeiger, der zu nah am Signal steht
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Block	Enthält einen Anzeiger, der zu nah am Signal steht
D-Weg	Durchlaufweg der Länge 0
D-Weg	VH ist ein Durchlaufweg kleiner als jeweils D0-AG-Pegel
D-Weg	VH ist ein Durchlaufweg kleiner als jeweils D0-AG-Pegel
D-Weg	VH ist ein Durchlaufweg kleiner als jeweils D0-AG-Pegel
D-Weg	Durchlaufweg der Länge 0
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D-Weg	VH ist ein Durchlaufweg kleiner als jeweils D0-AG-Pegel
D-Weg	VH ist ein Durchlaufweg kleiner als jeweils D0-AG-Pegel
D-Weg	Durchlaufweg der Länge 0
D-Weg	Durchlaufweg der Länge 0

# Timetable Manager

- ◆ From the Timetable Manager you can enter a train and its timetable data
- ◆ The timetable data may be edited interactively in large tables or in simple graphical manner
- ◆ Every modification concerning the train route causes a new calculation of the minimum running time

# Timetable Manager

- ◆ **When creating a timetable or change an existing timetable some conflicts happen. These conflicts will be displayed for the entire network.**
- ◆ **The results of the timetable construction may be printed as graphical timetables and track occupation plans. Furthermore, all tables may be exported into Excel or ASCII formats.**

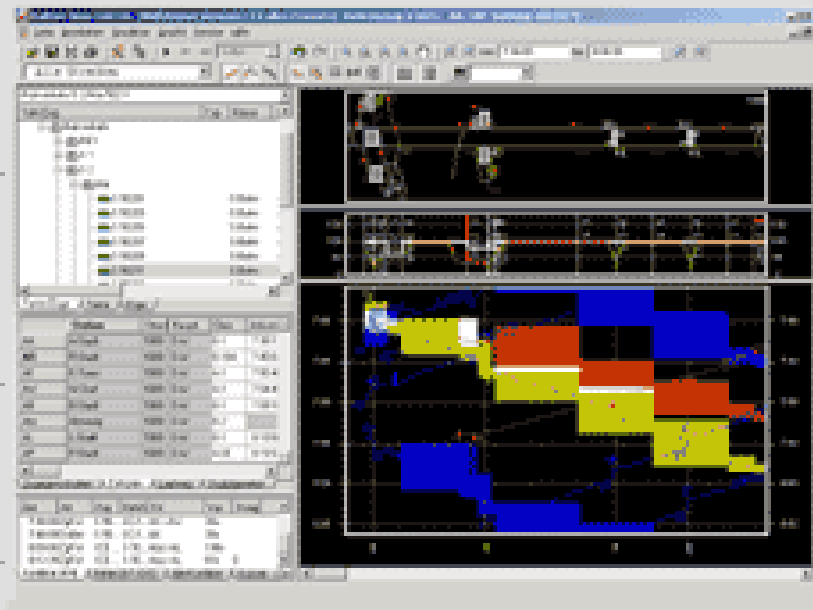
# Timetable Manager

## Timetable Manager

*Hierarchical train  
and pattern list*

*Timetable tabular*

*Conflicts*

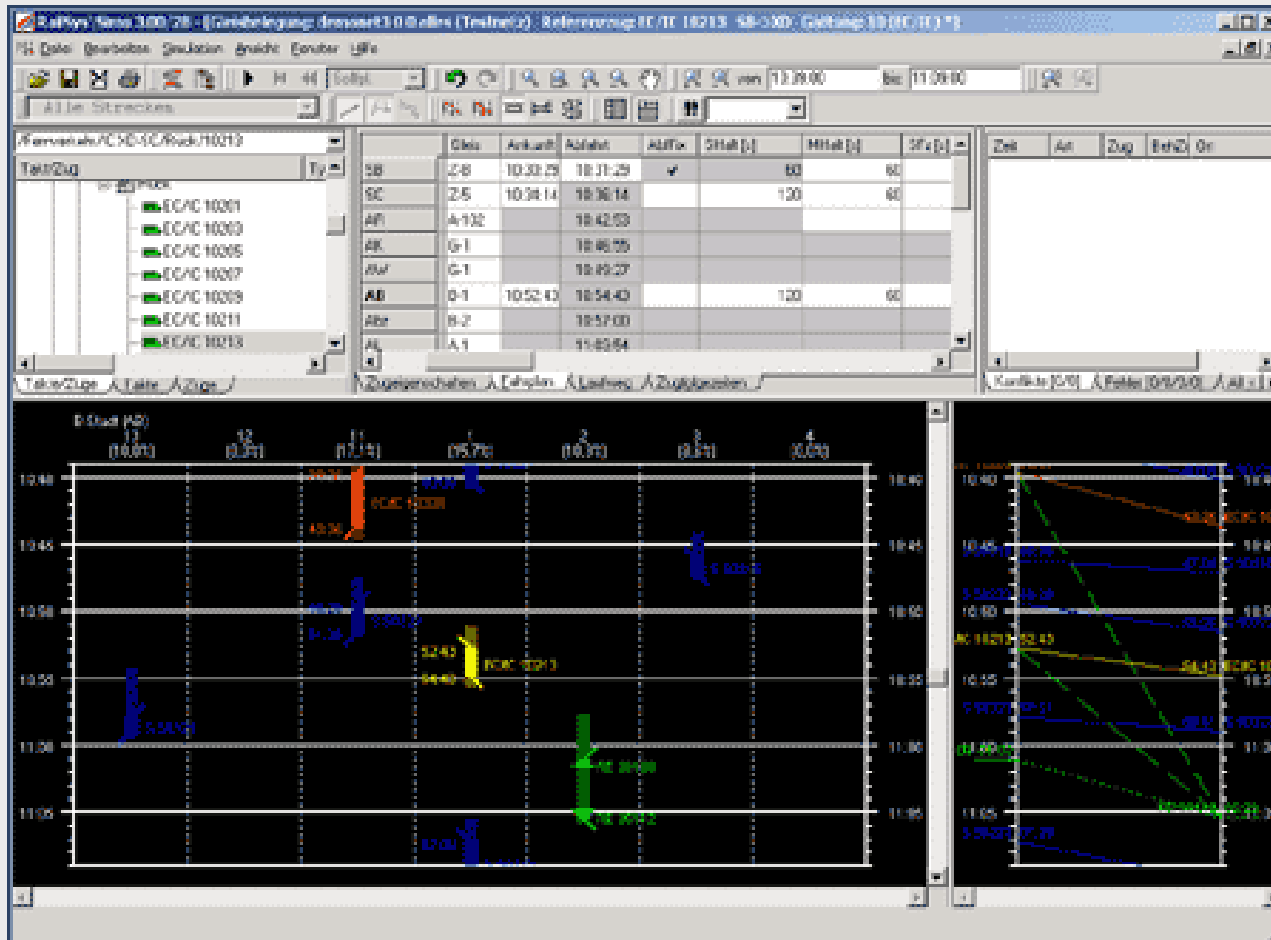


*Track layout*

*Speed  
distance graph*

*Graphical  
timetable*

# Timetable Manager – Track Occupation

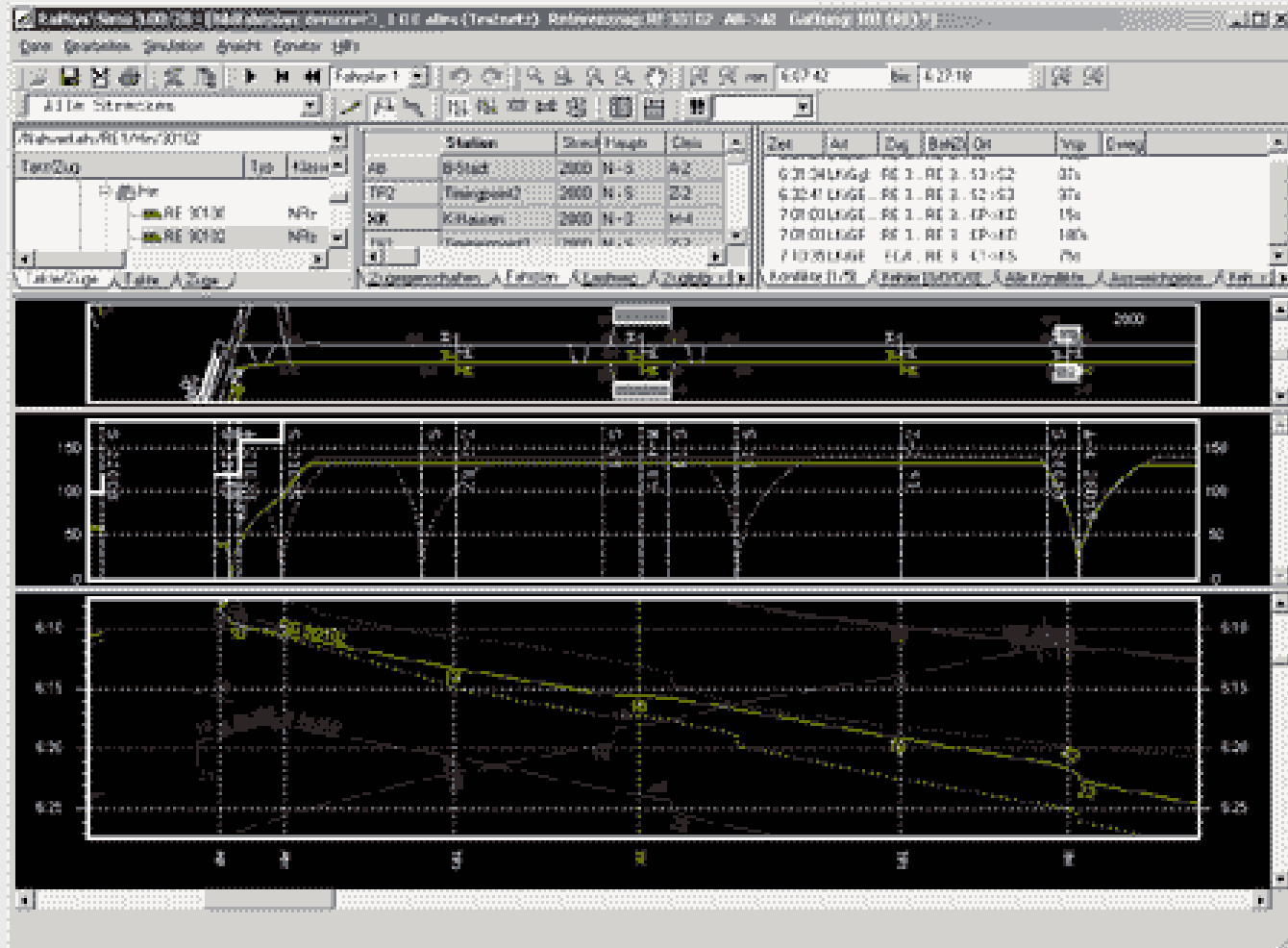


# Simulation

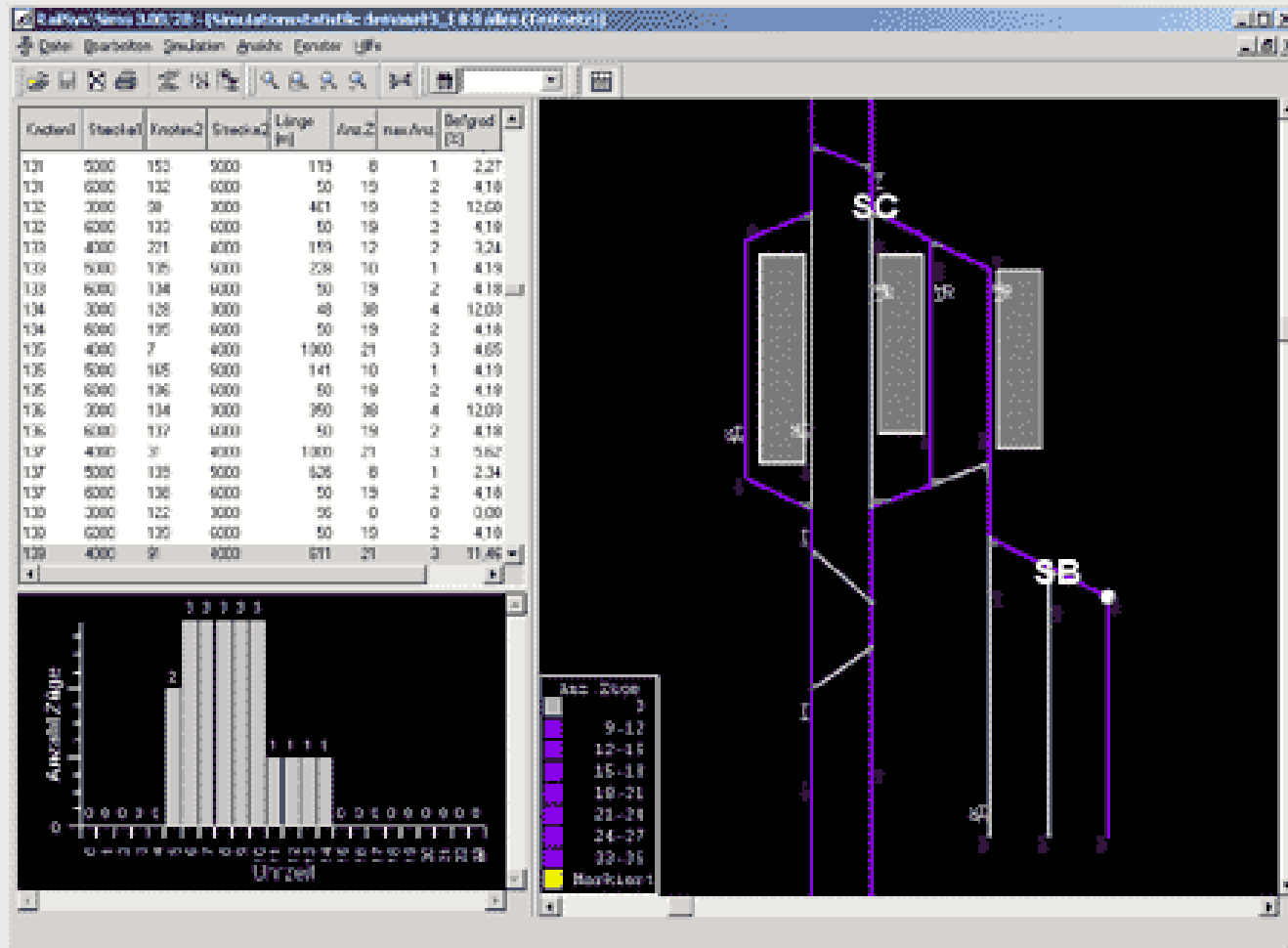
- ◆ **Synchronous and event orientated simulation**
  - The position of all trains in the network is calculated simultaneously. Its advantage is that all trains run in interaction with the signaling system as in reality including the influence of other trains.



# Actual speed graph and time distance graph after the simulation



# Track occupied timetable and operational simulation



# Statistical Evaluations

## ◆ Data to evaluate

- Average delay per train (at arrival and/or departure)
- Number of delayed trains (at arrival and/or departure)
- Rate of delayed trains (at arrival and/or departure)
- Distribution of delays (at arrival and/or departure)
- Delays between two stations

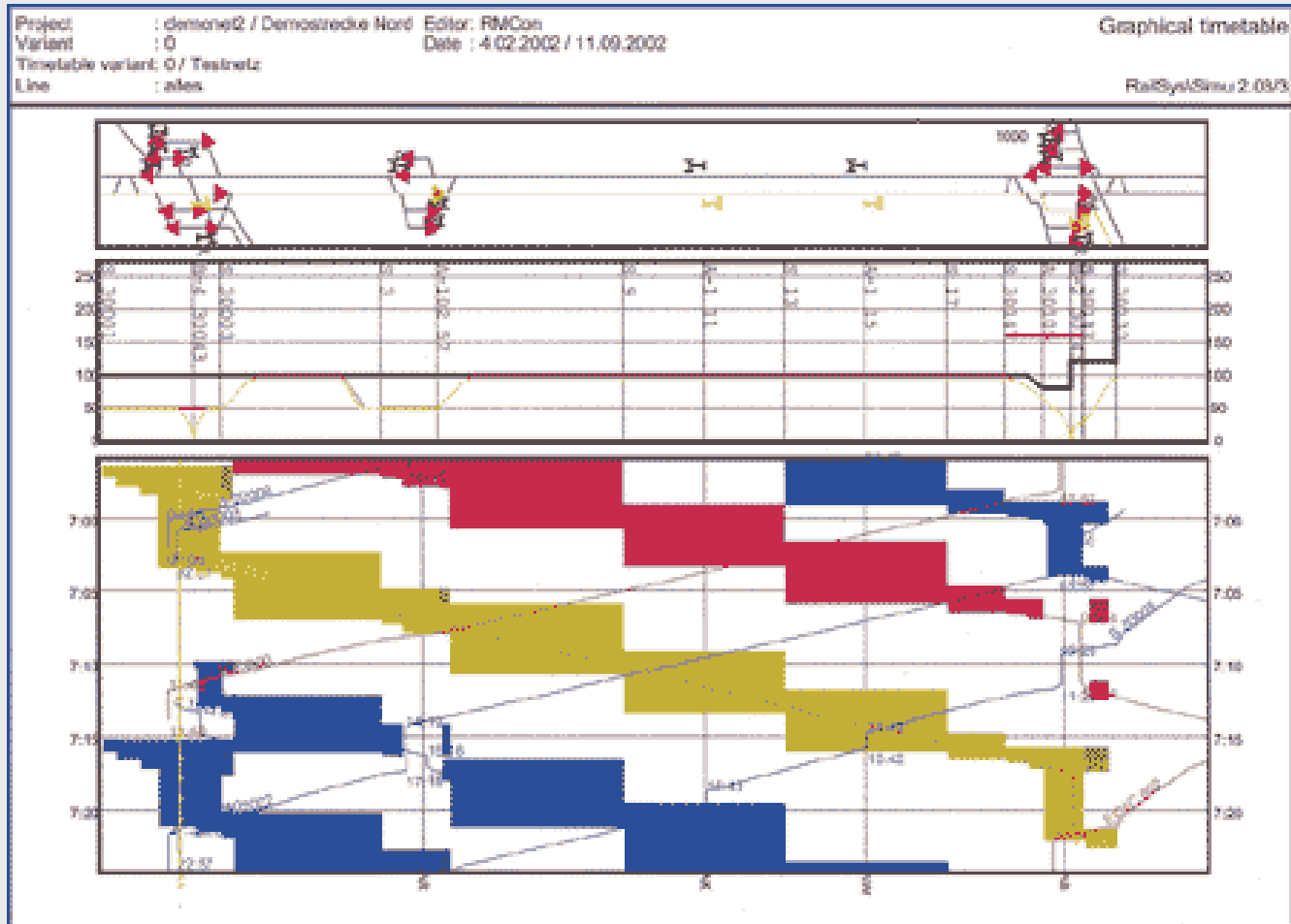
# System requirements

- ◆ **Windows NT/2000/XP**
- ◆ **Memory: 256 or 512 MB (according to size of project)**
- ◆ **Hard disc: 300 MB**
- ◆ **Screens: resolution of 1,024 x 768 or more**

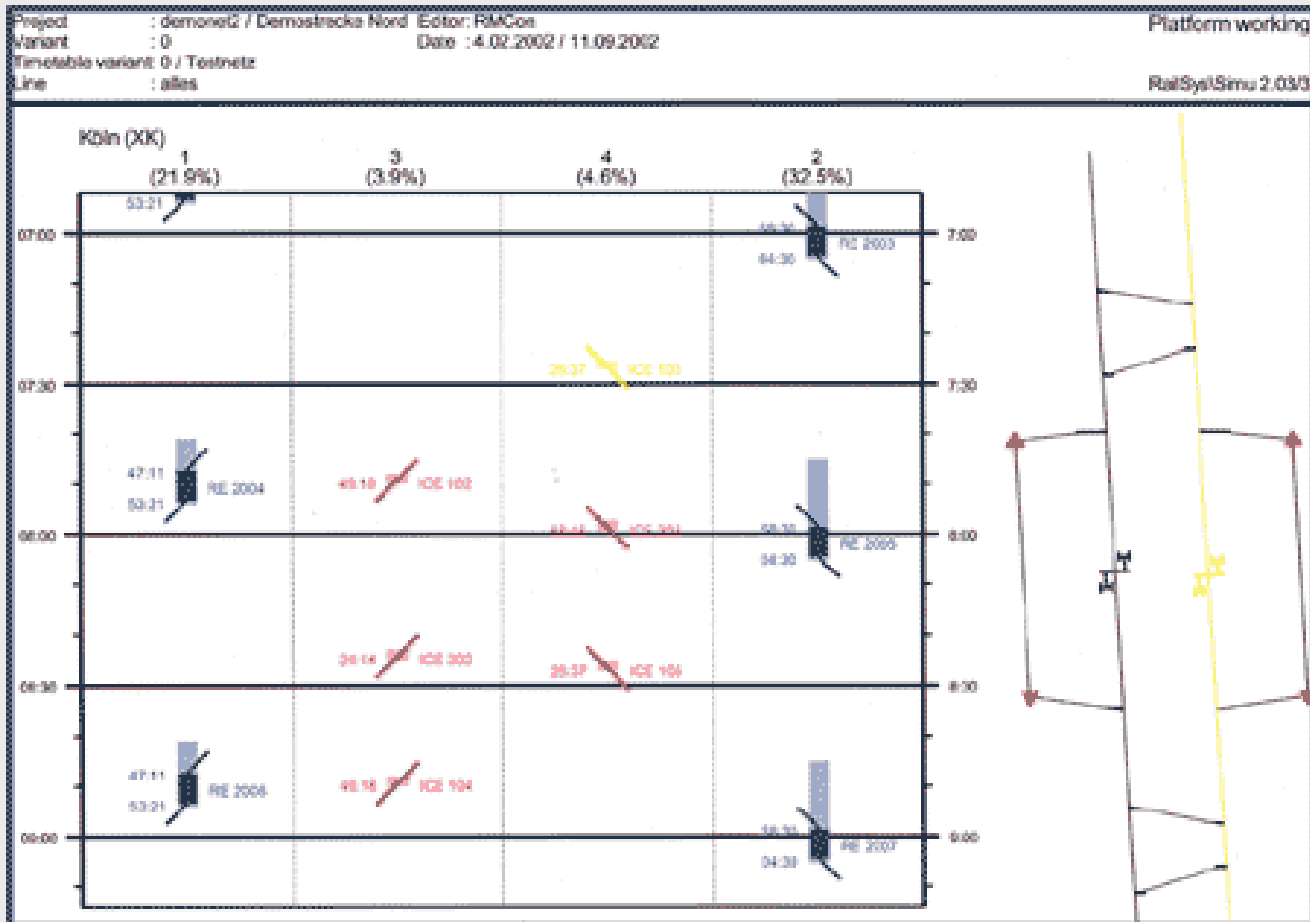
# Output possibility

- ◆ Graphical timetable
- ◆ Track occupation diagram
- ◆ Delay statistics
- ◆ Train lists
- ◆ Running time tables
- ◆ Track networks

# Print of a graphic timetable



# Print of track occupation



# Print of running Timetable

RailSys/Simu++  
2.03/3

User: amh01  
Project: demon02  
Variant: 0

Wednesday, 11. September 2002  
11:59:12

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## Table of running times

Train number: 301 (3, ICE 3)

Station	Station/ Track	Arrival	Departure	Dwell time	Minimum Dwell time	Dwell time margin	Running time	Minimum running time	Running time margin	Complete margin
AA	Amsterdam	05:29:55	05:34:05	04:10	01:00	02:00				02:00
AR	Rom	05:39:25	05:39:25							
AK	Kopenhagen	05:43:41	05:43:41							
AW	Wien	05:45:16	05:45:16							
AB	Berlin	05:49:26	05:54:06	04:40	02:00	02:40	14:31	13:42	00:49	03:29
AK	Köln	05:58:45	05:58:45							
XM	Mallard	06:02:43	06:02:43							
XP	Prag	06:07:19	06:07:19							
XD	Düsseldorf	06:11:09	06:13:29	02:20	02:00	00:20	17:03	16:05	00:58	01:28
QG	Qölnborg	06:20:00	06:20:00							
QM	Madrid	06:23:39	06:23:39							
OB	Birmingham	06:28:03	06:29:03							
OY	York	06:31:21	06:31:21							
OV	Valencia	06:35:32	06:35:32							
RH	Hannover	06:37:46	06:37:46				24:07	22:17	01:50	01:50



# 5 - سیستم‌های مکانیزه RailSys -9-5

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