

OpenPowerNet

Release Notes Version 1.4.0

Institut für Bahntechnik GmbH
Branch Office Dresden

Document No. OPN/RN/1.4.0

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Author	Review	Release
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Date	Date	Date
Martin Jacob	Harald Scheiner	Dr. Jörg von Lingen

1 Introduction

1.1 Overview

The purpose of this document is to describe the changes and the status of OpenPowerNet version 1.4.0. The document contains:

- List of delivered files on DVD,
- Description of the main functionality,
- Any restrictions known,
- List of corresponding documentation and
- Known issues.

1.2 Configuration

See document Installation Instruction version 1.4.0 for required third-party software versions.

1.3 Acronyms and abbreviations

The following abbreviations are used within this document.



Abbreviation	Description
2AC	2 Phase AC
AC	Alternating Current
ATM	Advance Train Module
DC	Direct Current
DVD	Digital Versatile Disk
GUI	Graphical User Interface
ODBC	Open Database Connectivity
PSC	Power Supply Calculation

2 List of files on DVD delivery

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OPN_InstallationInstruction_1.4.0.pdf
OPN_ReleaseNotes_1.4.0.pdf
OPN_UserManual_1.4.0.pdf
OpenPowerNet\my.ini
OpenPowerNet\createUser.bat
OpenPowerNet\OpenPowerNet-1.4.0.zip
OpenTrack\OpenTrack.V_1.6.6.2012-03-29.zip
ThirdPartyPrograms\ required by OpenPowerNet, see Installation Instructions
update\ empty

```

OPN/RN/	 OpenPowerNet	 Institut für Bahntechnik GmbH
Page 3 of 6	Release Notes Version 1.4.0	Issue 2012-05-07



3 Main functionality

OpenPowerNet version 1.4.0 has the following main functionality:

- Calculation of AC, 2AC and DC power supply system,
- Calculation of magnetic coupling of conductors is done internally,
- Calculation of tractive effort used by OpenTrack and analysis,
- Calculation of braking effort for analysis,
- Evaluation of tractive and braking current limitation,
- Calculation of electrical engines with single or multiple propulsion systems,
- Division of power consumption for multiple Train Operating Companies,
- Evaluation of station energy storage for stabilisation of line voltage and energy saving,
- Evaluation of engine energy storage,
- Consideration of coasting behaviour of the courses,
- Calculation of short circuit currents,
- Quick evaluation of network structure using constant current engine model,
- Visualisation of results using analysis of data with prepared Excel-Files and
- Visualisation of results using the automated analysis of the Analysis Tool.

The latest changes since version 1.3.2 are as follows:

- **General:**
 - Remove attribute "recordComputation2DB" from root element of the Project-File.
 - Rename wrong spelled attribute of vehicle energy storage "tracktionRatio" to "tractionRatio".
 - Improve performance to speed up the simulation.
 - New booster transformer model.
 - New model voltage limiting device (VLD).
 - New feature to merge multiple separate defined networks into one network for simulation. This enables the user to simulate only the part of the electrical network he want to evaluate out of one network configuration containing the network wide electrical infrastructure.
 - New simulation time windows per network to specify the usage of a network during the simulation run. Multiple simulation time windows may be defined.
 - New simulation status notification via email.
 - Change schema version check from exception to error message. In this way the simulation will run also if no access to schema files.
 - Optimise dump upload and import for localhost operations. Now database read the files instead of transferring them via TCP/IP.
 - Multiple bugs fixed in this version.
- **Excel Analysis:**
 - Added the following Excel-Files to analysis menu:
 - TrainGraphVoltage.xlsx,

OPN/RN/		
Page 4 of 6	Release Notes Version 1.4.0	Issue 2012-05-07

- TrainGraphCurrent.xlsx,
- TrainGraphEffort.xlsx,
- TrainGraphApparentPower.xlsx,
- VLD.xlsx

- **Analysis Tool:**

- Show time scope in chart and sheet titles.
- Charts for line: Added column which contains unmapped position of the pantograph that causes the extreme voltage to data table.
- Significant performance improvements, especially in energy calculation.
- Create charts for voltage between conductors. Currently the position of the previous slice is used. Output is created for Rail-Earth and ContactWire-Rail.
- Charts for line: Added function "mean" (average absolute values).

- **GUI:**

- Update to Eclipse framework 3.6.
- Display splash screen.
- Use perspectives "OPN", and "PSC Viewer" to improve handling.
- Add default update locations.
- Clear console after x lines instead of x simulation time steps. This was problematic in case of many messages within one time step.

- **ATM:**

- Add current limitation versus voltage and speed, $I=f(U,v)$.

- **PSC**

- Add messages in case the allowed angle respective ATM-PSC iteration exceeds 90% of allowed iterations to give feedback of what is going on.
- Reduce displayed messages during simulation run.

4 Known restrictions

OpenPowerNet is tested with OpenTrack version 1.6.6 (2012-03-29) and should only be used with this version.

OpenPowerNet is a single user application. It is not tested to use the same database for multiple users at the same time.

The Engine-File uses the RailML rollingstock schema version 1.03 with OpenPowerNet specific extensions and is therefore not 100% compatible with the mentioned version 1.03.

5 Version of corresponding documentation

The following table lists the version of the documents related to OpenPowerNet 1.4.0.

Document	Version
Installation Instruction	1.4.0
User Manual	1.4.0

6 Known issues

The following table contains all known but unsolved bugs.

ID	Summary	Status
371	<p>When using larger time steps other than 1s, OpenTrack sends the requests not for all courses in the same time raster but OpenPowerNet is designed to calculate always in the same time raster.</p> <p>Workaround 1: Use always 1s simulation time steps.</p> <p>Workaround 2: Set all times within OpenTrack in the raster according to the selected simulation time step, e.g. for 3s time step only time hh:mm:00, hh:mm:03, hh:mm:06</p> <p>The simulation will be terminated by OpenPowerNet in case of OpenTrack requests outside of the time raster.</p>	Can't be solved.
458	<p>The information of split, merged and connected courses is not available in OpenPowerNet. Therefore the engine energy storage of an engine will be reset to the initial values even if the new course is connected with the previous course and the two courses represent the same physical train.</p>	Open