



OpenPowerNet
Release Notes Version 1.3.0

Institut für Bahntechnik GmbH
Branch Office Dresden

Document No. OPN/RN/1.3.0

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

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1 Introduction

1.1 Overview

The purpose of this document is to describe the changes and the status of OpenPowerNet version 1.3.0. 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 1.3.0 for required third-party software versions.

1.3 Acronyms and abbreviations

The following abbreviations are used within this document.



Abbreviation	Description
DVD	Digital Versatile Disk
DC	Direct Current
AC	Alternating Current

2 List of files on DVD delivery

```

OPN_InstallationInstruction_1.3.0.pdf
OPN_ReleaseNotes_1.3.0.pdf
OPN_UserManual_1.3.0.pdf
OpenPowerNet\my.ini
OpenPowerNet\createUser.bat
OpenPowerNet\OpenPowerNet-1.3.0.zip
OpenTrack\OpenTrack.V_1.5.5_2009-03-19.zip
ThirdPartyPrograms\HASPUserSetup.exe
ThirdPartyPrograms\jre-6u14-windows-i586.exe
ThirdPartyPrograms\MCRInstaller_R2009a_win32.exe
ThirdPartyPrograms\MCRInstaller_R2009a_win64.exe
ThirdPartyPrograms\mysql-connector-odbc-3.51.27-win32.msi
ThirdPartyPrograms\mysql-connector-odbc-5.1.5-win32.msi
ThirdPartyPrograms\mysql-connector-odbc-5.1.5-winx64.msi
ThirdPartyPrograms\mysql-essential-5.0.67-win32.msi
ThirdPartyPrograms\mysql-essential-5.0.67-winx64.msi
ThirdPartyPrograms\mysql-gui-tools-5.0-r14-win32.msi
ThirdPartyPrograms\odbcad32 (x86).lnk
ThirdPartyPrograms\odbcad32.lnk
ThirdPartyPrograms\vcredist_x64.exe
ThirdPartyPrograms\vcredist_x86.exe
update\artifacts.xml
update\content.xml
update\index.html
update\site.xml
update\features\de.bahntechnik.dd.opn.bin_1.3.0.v_201003311200.jar

```

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```

update\features\de.bahntechnik.dd.opn.psc.prj.ui_0.3.0.v_201003311200.jar
update\features\de.bahntechnik.dd.opn.ui_0.3.0.v_201003311200.jar
update\plugins\de.bahntechnik.dd.opn.ana.help_0.3.0.v_201003311200.jar
update\plugins\de.bahntechnik.dd.opn.ana_0.3.0.v_201003311200.jar
update\plugins\de.bahntechnik.dd.opn.bin.help_1.3.0.a1_201002110900.jar
update\plugins\de.bahntechnik.dd.opn.bin_1.3.0.v_201003311200.jar
update\plugins\de.bahntechnik.dd.opn.psc.prj.ui.diagram_0.3.0.v_201003311200.jar
update\plugins\de.bahntechnik.dd.opn.psc.prj.ui.edit_0.3.0.v_201003311200.jar
update\plugins\de.bahntechnik.dd.opn.psc.prj.ui.editor_0.3.0.v_201003311200.jar
update\plugins\de.bahntechnik.dd.opn.psc.prj.ui.help_0.3.0.v_201003311200.jar
update\plugins\de.bahntechnik.dd.opn.psc.prj.ui_0.3.0.v_201003311200.jar
update\plugins\de.bahntechnik.dd.opn.ui.help_0.3.0.v_201003311200.jar
update\plugins\de.bahntechnik.dd.opn.ui_0.3.0.v_201003311200.jar
update\plugins\de.bahntechnik.dd.opn.util_0.1.1.v_201001110000.jar
update\plugins\de.bahntechnik.dd.util_1.0.3.v_200908261600.jar
update\web\site.css
update\web\site.xsl

```



3 Main functionality

OpenPowerNet version 1.3.0 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,
- 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 1.2.1 are as follows:

- **General:**
 - Bugfix 359: For limited auxiliary power and consuming engine the regenerated power was not added to auxPower_kW in database.
 - Bugfix 358: For limited auxiliary power the engine never achieved a positive effort. As no traction power is needed for $v=0$ ($P=F \cdot v$), the full effort can be achieved for $v=0$ now.
 - Bugfix 352: Effort requests where previously limited according to the ATM model while outside of timescope. Now the requests are returned to OT as requested to reach the same train positions like in simulation without OPN at the beginning of timescope.

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- Skip Big Effort Changes: When active than the requested effort is limit to the train resistance in case:
 - old effort < 0kN,
 - new requested effort > 0 kN,
 - the engine is inside an electrical network and
 - NEW: the new requested effort > train resistance.
 - Bugfix: The last timestep of a course was not simulated in OPN in case the trainDied request sent by OT had the same timestamp.
 - Check that all time steps are in the simulation time step raster set in OpenTrack. If the check fails the simulation will be terminated.
 - Bugfix 368: Set internal ID for track based on network instead of line, which could lead to wrong conductor display in Automatic Analysis.
 - Linked files in project file (rstFile, switchStateFile, typedefsFile) may now be defined using relative path to project file.
 - Display warning instead of error if project file uses invalid schema version.
- **Excel Analysis:**
 - Bugfix: PowerSupply2.xls: Correct display of values in combobox for SELECTION (2) tab.
 - Voltage.xls: Increase the course curve to max 100 values.
 - Add engine energy storage Excel file.
 - Update all prepared Excel files to Excel 2007.
 - Removed database password from queries inside prepared Excel files. It is advised to configure an ODBC connection named "pscreults" with user "opndbusr" and empty password.
 - Change element Train to Course and attribute trainID to courseID in OpenPowerNet schema.
 - Change column trainID to courseID in database table engine.
- **Analysis Tool:**
 - Added possibility to select output file type Excel or PDF according to license model
 - Added button "Autofill row" to selection dialogue for lines. It may be used to automatically make a selection for the visible items according to the selected chart type. The first matching reference item found in list or the reference item of type "Earth" and name "E" of the line will be selected.
 - Write information file to output directory.
 - Print header and footer on each output page.
 - Speedup for Excel file creation.
 - Display milliseconds in selection and output.
 - Data sheets are hidden in output files. This is optional for full license.
 - Added setup dialogue.
 - Added watermark. This is optional for full license.
 - Added possibility to add custom footer logo.

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- Moved overview sheets before data sheets.
- Vehicles: Added columns "eta_Brake", "eta_Brake_Net", "E_AUX_total" and columns for energy storage.
- Added description page for overview tables.
- Reworked formatting of overview tables.
- Improved detection of number format for chart axes.
- Fixed energy overview: Energy of storages was included in substations energy.
- Bugfix for vehicles energy with timestep != 1.0 s.
- Bugfix for energy calculation of network without connectors.
- Bugfix for mixed substation with TwoWindingTrafo and AutoTrafo.



- **GUI:**
 - Add engine energy storage Excel file to GUI menus.

- **ATM:**
 - Add energy storage for engines
 - with load models:
 - saver,
 - recovery
 - and unload models:
 - panto_I_max,
 - storage_P_max,
 - storage_P_aux,
 - storage_P_traction and
 - storage_P_traction_ratio.
 - Each engine may have multiple storages. The share of the available or provided energy considered by the storage can be specified for each energy storage.
 - Bugfix: The current limitation iteration could fail for braking engines which had no maxRecoveryVoltage set.
 - The value of auxPower_kW in table enginedata now includes the power of the eddy current brakes.
 - Bugfix 374: Allow coasting engine to use electrical brake.
 - Improved current limitation iteration for more stability.

- **PSC**
 - Bugfix 349: Coupling calculation in the first section was incorrect in case earth node was not at the first slice in a line.

4 Known restrictions

OpenPowerNet is tested with OpenTrack version 1.5.5 (2009-03-19) and should only be used with this version.

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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 1.3.0.

Document	Version
Installation Instruction	1.3.0
User Manual	1.3.0

6 Known issues

The following table contains all known but unsolved bugs.

ID	Summary	Status
371	<p>When using larger time steps than 1s OpenTrack send 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 from OpenPowerNet in case of OpenTrack requests outside of the time raster.</p>	Can't be solved.