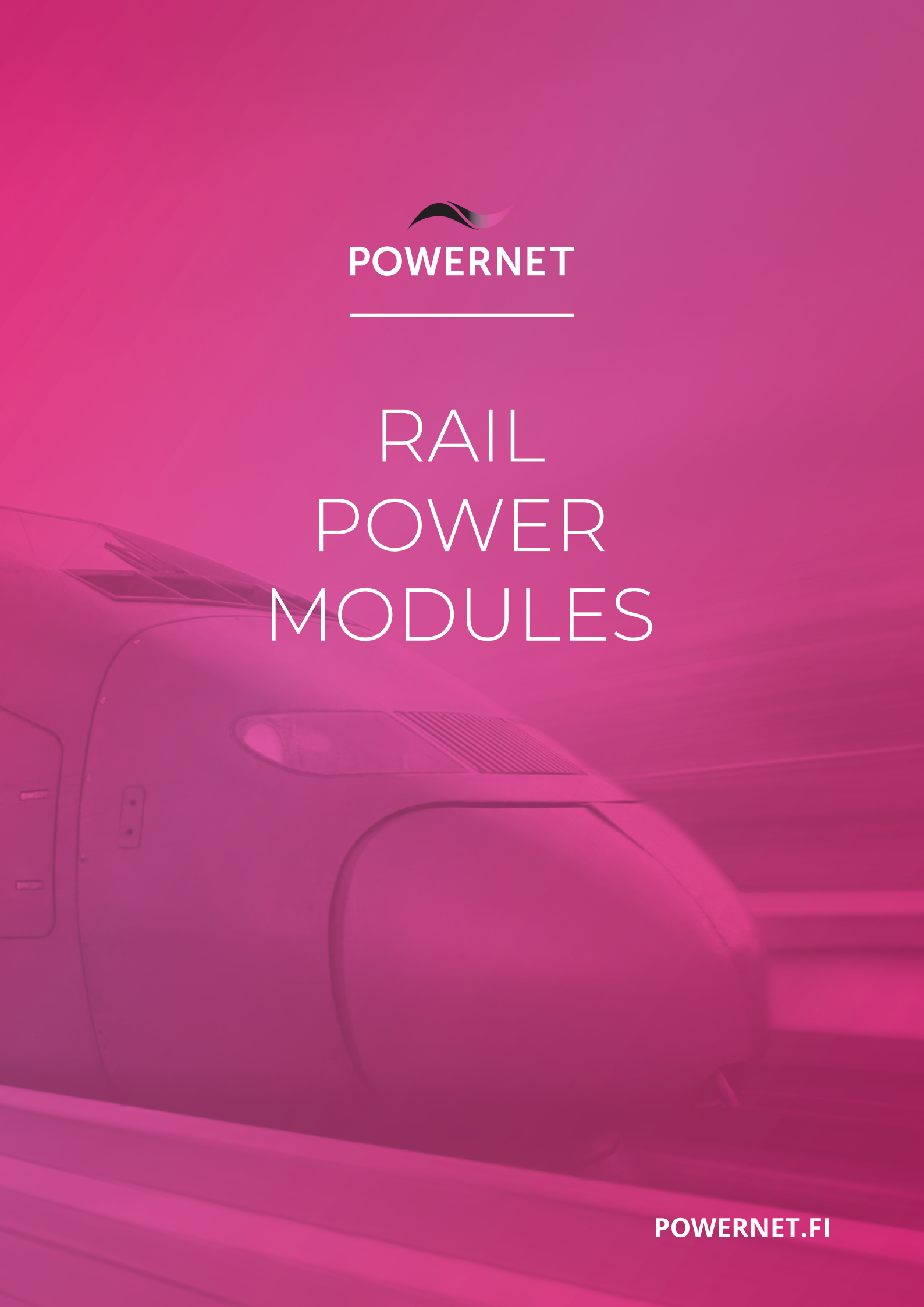
POWERNET

RAIL POWER MODULES



POWERNET.FI

WHEN STANDARD

9000-SERIES BATTERY MANAGEMENT AND POWER MODULES
Powernet 9000-series chargers are the flagship solution for rail industry
Communication via CAN bus or Ethernet TRDP interface
Charging parameters available for wide range of battery technologies
Battery voltage measurement for condition monitoring.

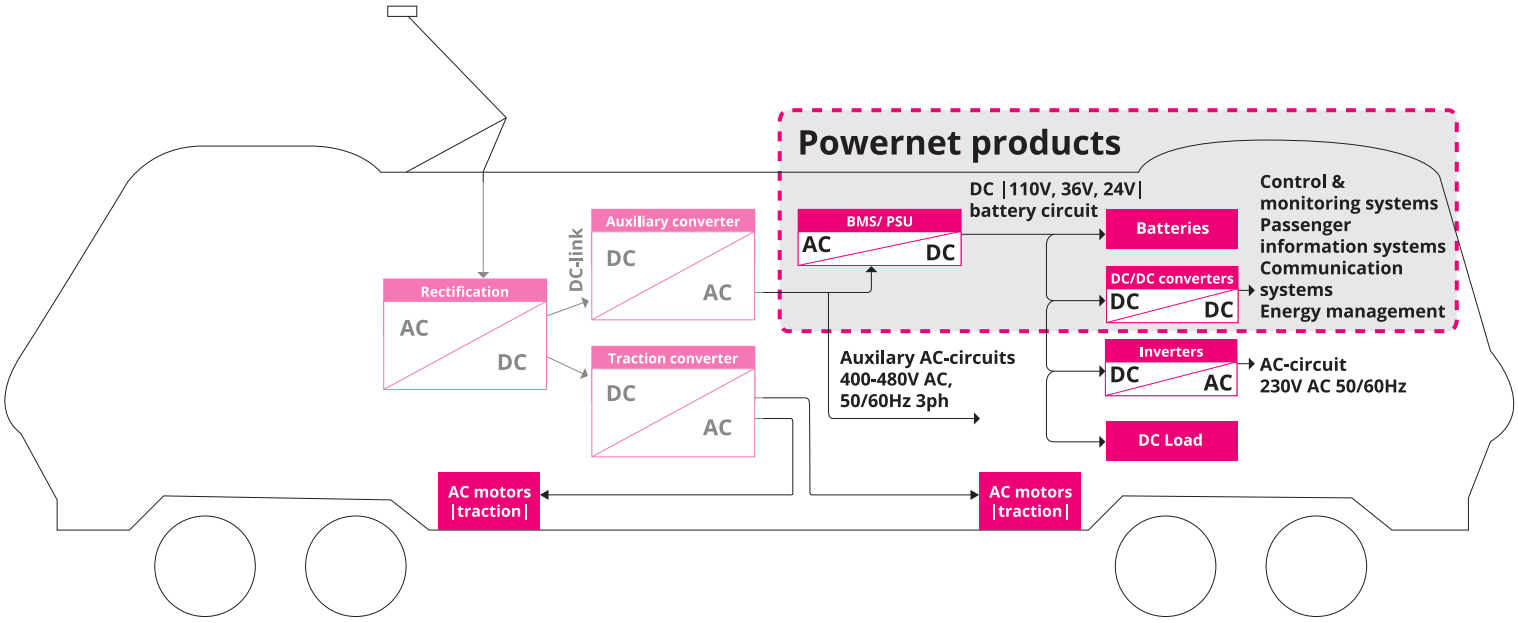
Three major charging modes:

- Battery charging in normal operation
- Battery boost
- Battery charging with temperature compensation

Light weight and compact construction
Customised solutions available

Main parameters	
Input voltages	230/3x400 VAC, 24/36/110 VDC
Output voltages	24/36/110 VDC
Output power	500, 1000, 1500, 3000, 3200 W
Housing	IP20
Efficiency	up to 96%

IS NOT ENOUGH



RAIL APPROVED POWER SOLUTIONS

Powernet solutions are tailored for rolling stock applications.

APPLICABLE STANDARDS

Electrical Safety

Standard	Name
EN 50124–1:2001	Railway applications – Insulation coordination – Part 1: basic requirements – Clearences and creepage distances for all electrical and electronic equipment
EN 50155:2007	Railway applications – Electronic equipment used on rolling stock
EN 50153:2014	Railway applications – Rolling stock – Protective provisions relating to electrical hazards

Fire Safety

Standard	Name
EN 45545–1:2013	Railway applications – Fire protection on rail vehicles Part 1: General
EN 45545–2:2013 + A1:2015	Railway applications – Fire protection on rail vehicles Part 2: Requirements for fire behavior of material and components
EN 45545–5:2013 + A1:2015	Railway applications – Fire protection on rail vehicles Part 5: Fire safety requirements for electrical equipment including that of trolley buses, track guided buses and magnetic levitation vehicles

Electromagnetic Compatibility

Standard	Name
EN 50121–3–2:2006	Railway applications – Electromagnetic compatibility Part 3–2: Rolling Stock – Apparatus: • Radiated disturbance • Disturbance voltage • Radio-frequency electromagnetic field • Electrostatic discharge • Radio-frequency common mode • Fast transients • Surges

Shock and Vibration

Standard	Name
EN 61373	Railway applications - Rolling Stock Equipment - Shock and vibration tests

COMMUNICATION

Introducing TRDP – Train Real time Data Protocol

A growing demand for communication and ever-increasing data demand on-board are slowly exposing the limits of traditional I/O-signalling and CAN bus communication. To enable IIoT on-board a consortium of Rail companies has developed a new standard for on-board communication, TRDP*).

TRDP is an IP based real-time protocol and support dynamic topology changes in the train network. The physical medium for TRDP is Ethernet.

Powernet supports TRDP for all new rail devices.

Benefits of TRDP are

- Single common communication protocol
- Supports dynamic train configuration
- Will be the future solution for rail communications
- Enables Industrial Internet of Things (IIoT)
- Industrial IoT: Centralized predictive maintenance, asset monitoring
- TRDP is part of the Smart Train development in rail business
- Support for wireless data transmission in 3G/4G, railway GSM-R and Wi-Fi networks
- Life cycle efficiency

*) TRDP based Train Communication Network (TCN) development was started by five members in 2012. Currently there are a growing number of members and observers in the group committed to using the protocol.