

# Grid-eMotion™ Fleet

## Charging more with less

**HITACHI** **ABB**



Grid-eMotion™ Fleet is a scalable, modular and fully customizable solution for charging large fleets of electric vehicles in public and commercial transport. By concentrating most of the charging equipment at a central location, Hitachi ABB Power Grids is offering this pioneering technology to reduce the space requirement by up to 60% in confined depot environments.

### **INTEGRATING SEAMLESS INTO YOUR LOCAL POWER GRID**

Grid-eMotion™ Fleet is designed to facilitate the grid connection and in compliance with the most stringent power quality requirements

### **COMPACT CENTRALIZED CHARGING EQUIPMENT**

Available from 50 to 600kW power, mounted on withdrawable racks to facilitate maintenance

### **COMPATIBLE WITH ALL TYPES OF CHARGERS**

Charging points are configured to ensure full interoperability with the EV fleet:

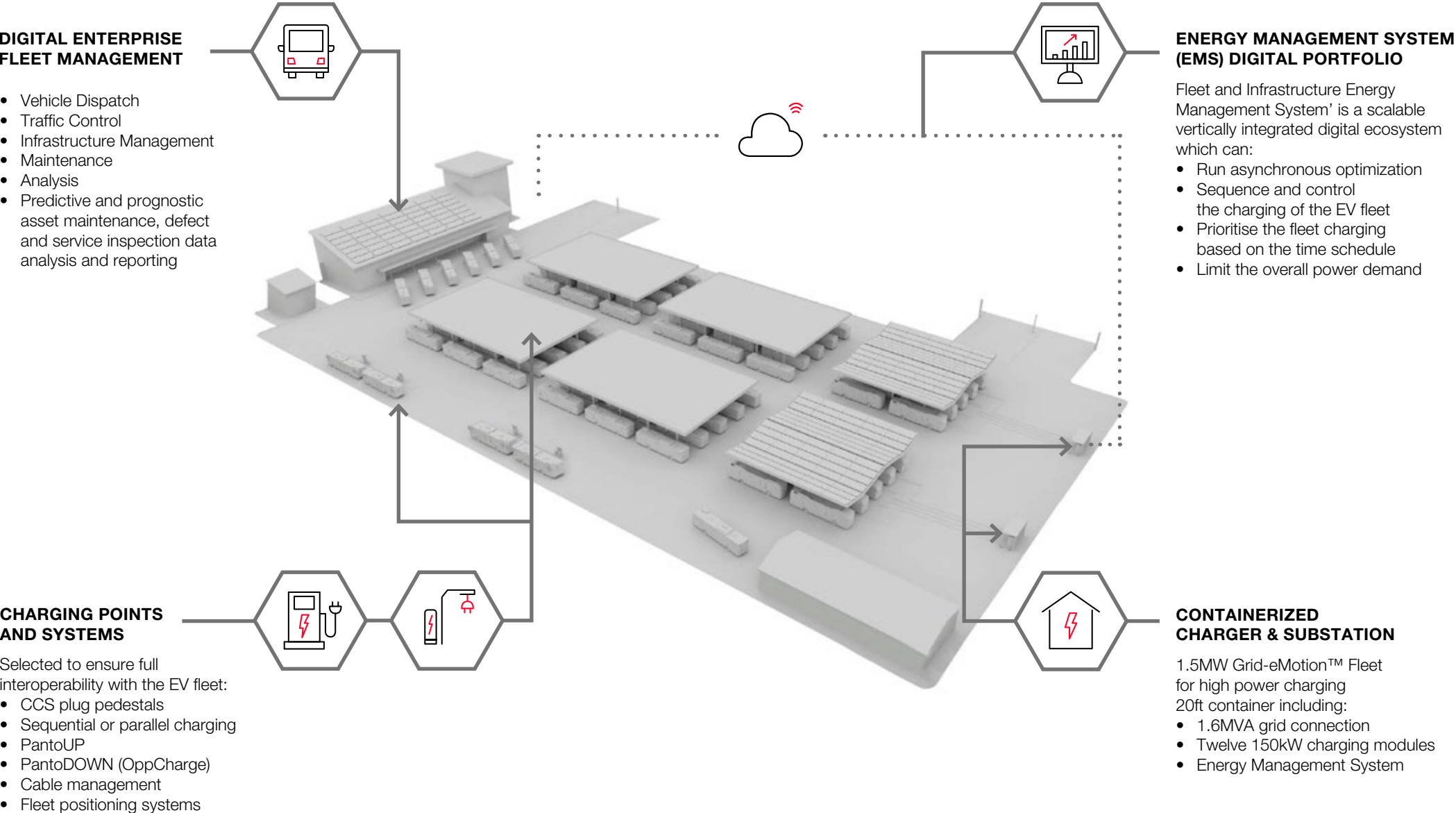
- Combined Charging System (CCS) plug pedestals
- Sequential or parallel charging
- PantoUP, PantoDOWN (OppCharge)
- Cable reels or stinger systems
- Fleet positioning systems

### **MAIN ADVANTAGES**

- Reduced space requirements and cabling
- Simplified interfaces
- Lower harmonic distortion
- Lighter installation at parking places
- Improved reliability, availability and maintainability
- Less site activities, shorter delivery time and lower risk of project delay
- Containerized, fully assembled, tested, ready to install
- Integrated with SCADA, energy management system (Open Charge Point Protocol - OCPP)
- Battery energy storage systems or photovoltaic/solar plant integration
- Connection to existing DC grid for customers already operating tram, metro or trolleybus networks

# Landscape

## e-mobility in public and commercial transport



# Tackling large scale EV fleet deployments

**The charging infrastructure for large fleets must provide efficient operation in confined spaces, smartly deliver and optimize energy consumption.**

With extensive power transmission and DC grid integration experience coupled with a wide portfolio of products and services, Hitachi ABB Power Grids is well positioned to tackle the transport industry's biggest challenges.



# Tackling large scale EV fleet deployments



“ We need a system to charge all our vehicles that fits in the limited space available in our depots.

**TECHNICAL MANAGER**  
Public transport operator

## SMALL FOOTPRINT CHARGING SOLUTION

- Optimized footprint for EV Depots
- Prefabricated walk-in modular outdoor enclosures
- Robust and light weight design
- Wide range of power rating capacities

## LIMITED ENVIRONMENTAL IMPACT

- Optimized grid integration and use of renewables



“ We need to offer a flexible charging for different EV standards around the world.

**CHIEF TECHNOLOGY OFFICER**  
EV Vehicle manufacturer

## NEED TO OFFER BROADEST RANGE OF SERVICES

- Depot, terminal, opportunity and flash charging options available
- Grid to plug solution

## MEET REGULATORY STANDARDS

- Support the use of clean, renewable power
- Utility grid compliance, e.g. power quality



“ I need a smart system that will allow me to maximize the operation time of each vehicle.

**PLANNING & OPERATIONS MANAGER**  
Public transport operator

## DIGITAL ENERGY MANAGEMENT SYSTEM

- Cloud enabled remote monitoring and control
- Sequence and parallel charging control
- Lower overall power demand
- Prioritize charging on timetable

## RELIABILITY AND PERFORMANCE

- DC charge improves reliability and availability
- Web based management for predictive maintenance
- Standardized containerized solution for easy maintenance



“ I need a reliable global partner who can support my customers' infrastructure needs while I focus on delivery of the buses.

**BUSINESS DEVELOPMENTMANAGER**  
EV Vehicle manufacturer

## NEED SMALL FOOTPRINT CHARGING SOLUTION

- Light installation requirement at parking
- Compact DC system – saves up to 40%

## COMPATIBLE WITH GLOBAL STANDARDS

- Designed to meet the highest HSE standards
- High protection degree: IP 43/23D (MV SWG/Trafo)
- Applicable standards: IEC, GB, AS, GOST, ANSI, CSA

# Charging points and systems

## Grid-eMotion™ Fleet starts with 1MW depot power

Scalable, modular, fully customizable charging system

### RECTIFIER CUBICLE

Technical specification	
Typical Power	from 1000kW up to 3000kW
Type	Diode/Thyristor
Standard configuration	3 phase bridge 6 or 12 pulse
Maximum Permanent Voltage	900V DC
Insulation Voltage	2500V DC
Standards	EN 50163, IEC 60146
Overvoltage Category	OV3
Pollution Degree	PD3
Installation	Indoor
Operating Temperature	-5°C to +40°C
Humidity	≤ 90%
Altitude	≤ 1000m a.s.l.



1MW rectifier with  
ten 100kW EV chargers

### DC-DC CHARGERS' CABINET

Technical specification	
Typical Power	50kW 100kW 150kW, 300kW, 450kW, 600kW
Standards	EN 50328, IEC 60146
Features	<ul style="list-style-type: none"> <li>• Touch screen</li> <li>• 2-poles DC Breaker</li> <li>• Power section with drawable</li> <li>• Galvanic isolation</li> </ul>

### CHARGING POINT



Technical specification	
Features	<ul style="list-style-type: none"> <li>• Touch-screen display/buttons</li> <li>• CAN-bus/Ethernet connection</li> <li>• CCS-Combo 2 plug, 4.5m cable</li> <li>• Single plug, double plug with sequential or parallel charging</li> </ul>
Plug ratings	125A, 250A
Standards	ISO 15118, DIN 70121, IEC 61851-23/24

The cabinet is designed  
and manufactured  
to facilitate maintenance

# Charging points and systems, containerized chargers and digital solutions

## Grid-eMotion™ Fleet charging systems



1MW grid connection  
Ten EV chargers up to 100kW each



1.25MW grid connection  
Eight EV chargers 150kW each



1.5MW grid connection  
Twelve EV chargers 150kW each



2.5MW grid connection  
Twenty EV chargers 150kW each



Single plug charging point up to 250A



Double plug charging point up to 250A  
Sequential or parallel charging



PantoUP up to 600kW  
Integration of mast in cityscape



PantoDOWN (OppCharge) up to 600kW  
Integration of inverted pantograph and mast in cityscape

## Containerized charger and substation

Your solution for fast energization



- Prefabricated walk-in, modular outdoor enclosure
- Thermally insulated for increased equipment lifetime
- Robust and light weight design
- Wide range of ratings & capacities as well as layouts in steel, concrete and GRP
- Protection degree: IP 43/23D (MV switchgear/transformer)
- Applicable standards: IEC, GB, AS, GOST, ANSI, CSA, and more

## Battery Energy Storage System (BESS)

Stationary BESS for small depots or city terminals

- Up to 500kW power
- Grid-forming power converter
- Battery racks and battery management system
- Designed for grid integration of EV charging infrastructure depots and terminals
- For power requirement up to 500kW and energy storage of 670kWh
- Remote monitoring and control system
- Standardised enclosure for fast delivery at site



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