ebblo

MODULE OVERVIEW

EV Fleet Management with ebblo Horizon

Optimising Electric Vehicle (EV) fleet operations

Optimising EV fleet operations with ebblo Horizon

Modern electric bus operations demand advanced data-driven solutions to ensure reliability, efficiency, and sustainability. The ebblo Horizon ITCS solution offers support for integration and dispatch of electric bus fleets. The solution leverages CAN (Controller Area Network) data to enable real-time monitoring, predictive maintenance, and operational optimisation for electric bus fleets.

Core features

Battery monitoring: State of Charge (SoC) and State of Health (SoH) are critical for range prediction and charge planning for electric vehicles. The on-bus hardware communicates with the vehicle CAN interface to capture real-time data and makes this available in the control centre for visibility of SoC, SoH, and Range to service controllers. Critical alerts such as low SoC, which are configurable per battery type, over-voltage, high temperature, brake faults, motor issues, etc. are also displayed in the events table for service controllers to take prompt action.

Energy analytics: Our BI and analytics module offers a wide range of real-time KPI dashboards for energy consumption and operating mileage. It is tightly integrated with depot systems to provide holistic fleet insights in charge management schedules.

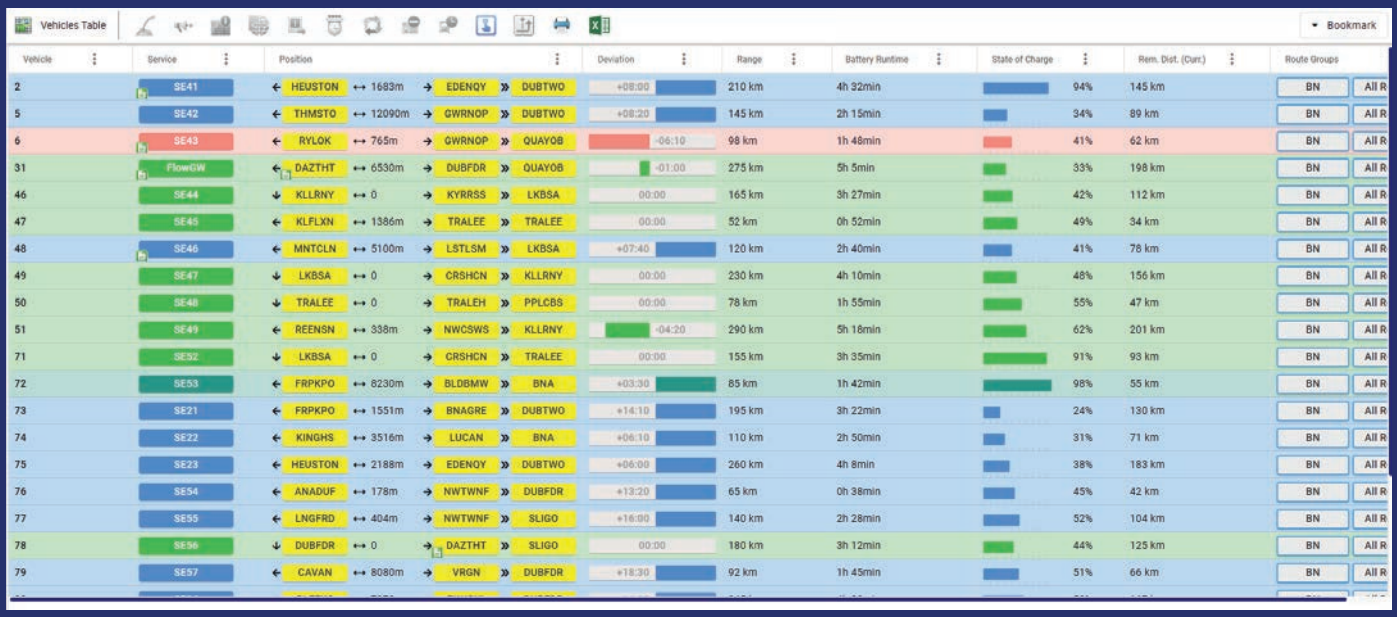
Charging Station monitoring: Our solution not only supports monitoring of vehicle charge but also enables service controllers to manage charging schedules and ad hoc charging. Our solution can integrate status information of all chargers through a charging management system via the VDV 463 interface. This enables it to monitor information including the status of chargers, availability of charger (free or occupied), identification of the vehicles, and remaining time to fully charge. When a vehicle's SoC approaches a minimum threshold, the service controller can use the information to plan an ad hoc charging task.

Data flow architecture

- **On-vehicle processing:** CAN data is filtered and aggregated through our onboard hardware. The router sends critical data in real time to the back office, while bulk data is stored in SAF files for historical analytics.
- **Backend integration:** Data is ingested via a Kafka broker and processed for alerts and BI reporting.
- **External interfaces:** Our solution supports the standard VDV 463 interface for integrating information from charging systems, especially the state of all chargers and whether a vehicle is connected to the charger including the predicted remaining time to complete the charging process.

Service Control User Interface

The service control user interface includes key information about electric vehicles, empowering service controllers to manage ad hoc charging requests. The images below show examples of how ebblo Horizon supports service controllers in managing the electric bus fleet.



Vehicle	Service	Position	Deviation	Range	Battery Runtime	State of Charge	Rem. Dist. (Curr.)	Route Groups
2	SE41	HEUSTON ↔ 1683m → EDENQY » DUBTWO	+08:00	210 km	4h 32min	94%	145 km	BN All R
5	SE42	THMSTO ↔ 12090m → GWRNOP » DUBTWO	+08:20	145 km	2h 15min	34%	89 km	BN All R
6	SE43	RYLOK ↔ 765m → GWRNOP » QUAYOB	-06:10	98 km	1h 48min	41%	62 km	BN All R
31	FlowGW	DAZTHT ↔ 6530m → DUBFDR » QUAYOB	-01:00	275 km	5h 5min	33%	198 km	BN All R
46	SE44	KLLRNY ↔ 0 → KYRRSS » LKBSA	00:00	165 km	3h 27min	42%	112 km	BN All R
47	SE45	KLFLXN ↔ 1386m → TRALEE » TRALEE	00:00	52 km	0h 52min	49%	34 km	BN All R
48	SE46	MNTCLN ↔ 5100m → LSTLSM » LKBSA	+07:40	120 km	2h 40min	41%	78 km	BN All R
49	SE47	LKBSA ↔ 0 → CRSHCN » KLLRNY	00:00	230 km	4h 10min	48%	156 km	BN All R
50	SE48	TRALEE ↔ 0 → TRALEH » PPLCBS	00:00	78 km	1h 55min	55%	47 km	BN All R
51	SE49	REENSN ↔ 338m → NWCSWS » KLLRNY	-04:20	290 km	5h 18min	62%	201 km	BN All R
71	SE52	LKBSA ↔ 0 → CRSHCN » TRALEE	00:00	155 km	3h 35min	91%	93 km	BN All R
72	SE53	FRPKPO ↔ 8230m → BLDBMW » BNA	+03:30	85 km	1h 42min	98%	55 km	BN All R
73	SE21	FRPKPO ↔ 1551m → BNAGRE » DUBTWO	+14:10	195 km	3h 22min	24%	130 km	BN All R
74	SE22	KINGHS ↔ 3516m → LUCAN » BNA	+06:10	110 km	2h 50min	31%	71 km	BN All R
75	SE23	HEUSTON ↔ 2188m → EDENQY » DUBTWO	+06:00	260 km	4h 8min	38%	183 km	BN All R
76	SE54	ANADUF ↔ 178m → NWTWNF » DUBFDR	+13:20	65 km	0h 38min	45%	42 km	BN All R
77	SE55	LNGFRD ↔ 404m → NWTWNF » SLIGO	+16:00	140 km	2h 28min	52%	104 km	BN All R
78	SE56	DUBFDR ↔ 0 → DAZTHT » SLIGO	00:00	180 km	3h 12min	44%	125 km	BN All R
79	SE57	CAVAN ↔ 8080m → VRGN » DUBFDR	+18:30	92 km	1h 45min	51%	66 km	BN All R

Figure 1: Vehicle table showing State of Charge and Range; the list can be sorted by SoC in ascending or descending order

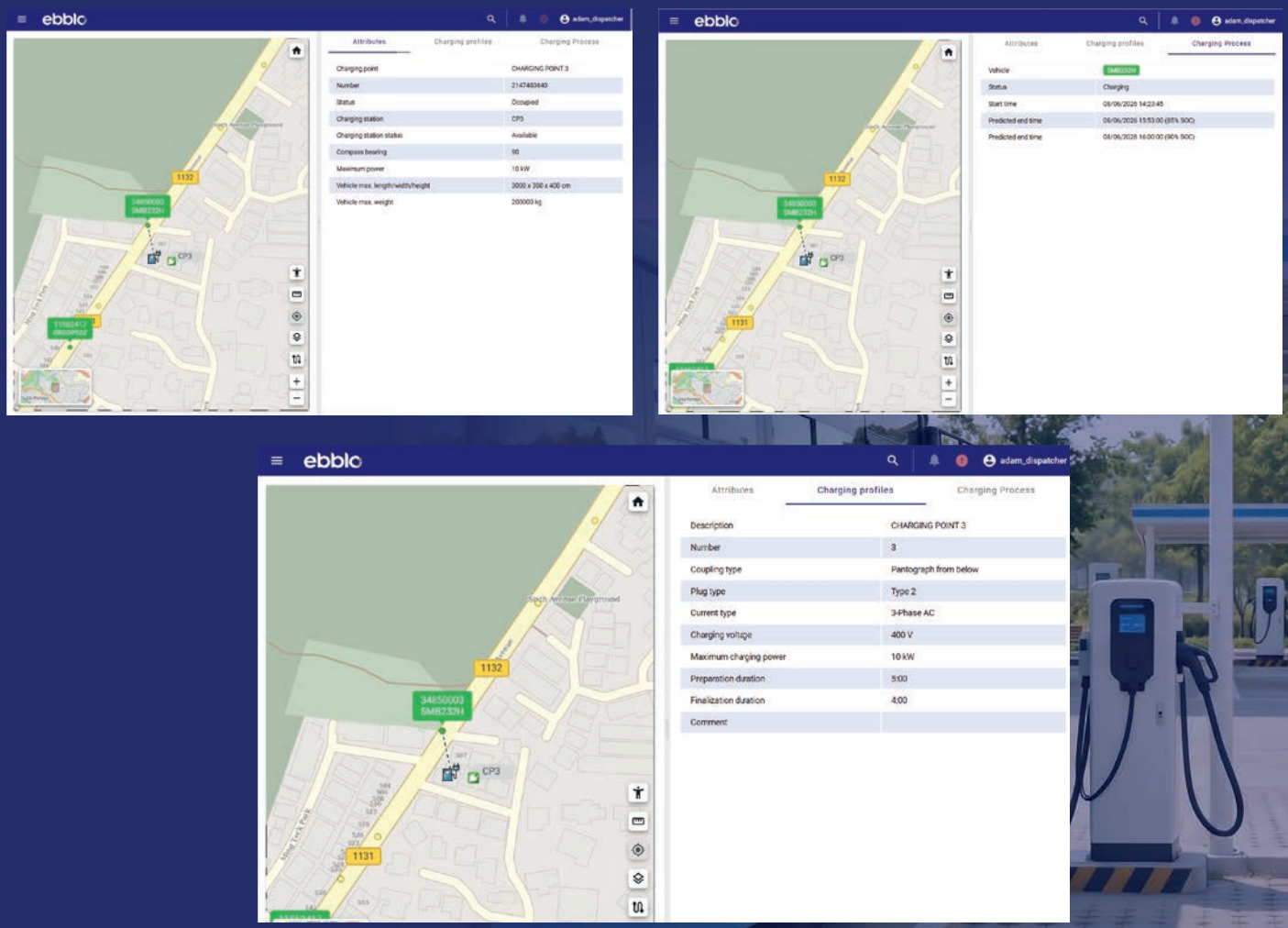


Figure 2: Charging stations showing GIS view, attributes, charging profiles, and charging process.

Key benefits

Improve operational efficiency: Optimise vehicle usage and prevent service disruptions.

Enhance safety: Detect and respond to critical faults and battery alerts in real time.

Reduce costs: Minimise downtime and repair expenses via predictive maintenance.

Support compliance: Provide automated reporting for regulatory and performance standards.

Integrated dashboard: The Service Control dashboard unifies information from all buses including battery health and charging level, critical SoC alerts, and data from charging management system, enabling service controllers to take informed decisions on ad hoc charging tasks.

Notes:

· For every type of electric vehicle, the CAN FMS matrix will be required to confirm the availability of relevant CAN data.

· The display of the charger status is currently available through the VDV 463 standard interface. Alternative interfaces may be offered on request.

See how our EV Fleet Management module fits into the ebblo Horizon solution.

Read the Solution Brochure

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