VECMOCON
TECHNOLOGIES

A Vehicle Intelligence Company

www.vecmocon.com

About Us

At the forefront of the EV revolution.

At Vecmocon, ingenious minds from India's leading IITs work on a mission to support vehicle and battery OEMs in accessing smart and certified electrical components. These components are Made in India, using our proprietary patented designs trusted by well-known EV brands.

We make end-to-end software-enabled compute components with integrated hardware, software & data play. Explore our range of Smart BMS, Smart Chargers, & Vehicle Intelligence Modules under the aegis of i-vec Drive vertical, a suite of connected components.

VECMOCON
TECHNOLOGIES

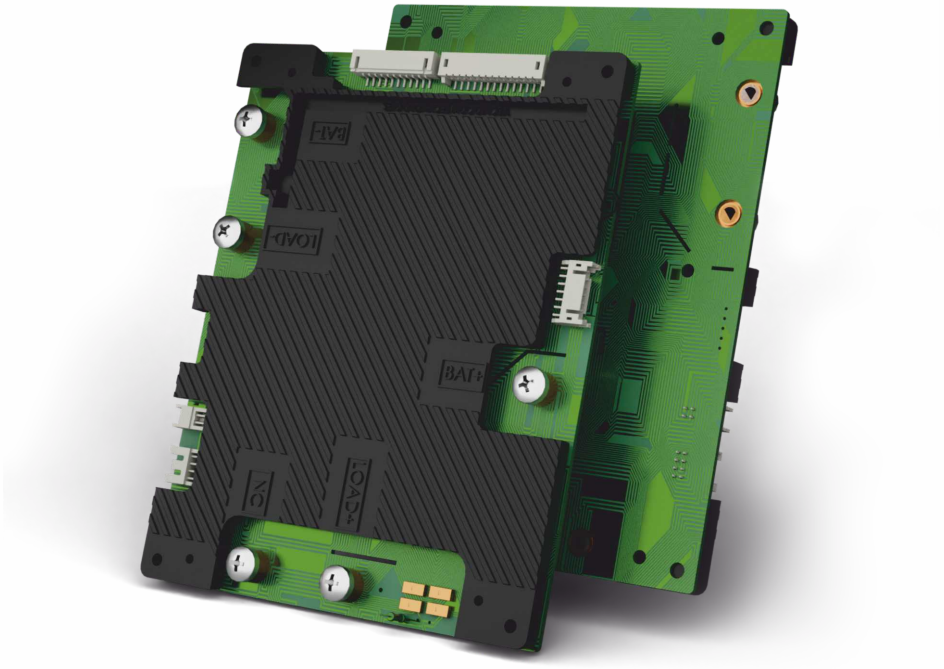
i-VEC® DRIVE

i-VEC® FINSIGHTS

i-VEC® SERVE

Powering the Future with Smart Technology

BMS (Battery Management System)



Description

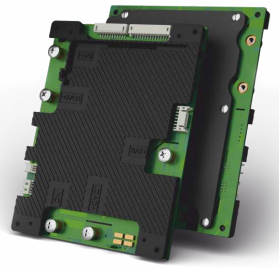
A smart BMS that is safe, ultra-efficient, cost-effective and has a high current delivery capability. This all-in-one smart BMS is designed for the automotive industry with no additional current sensors or external relays needed. The products are compatible with Lithium-Iron Phosphate(LFP) and Nickel Manganese Cobalt (NMC) in all cell form factors.

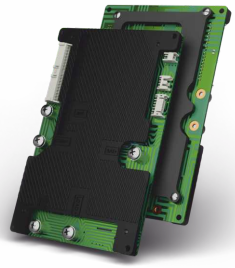
Fully compliant with AIS 156 Phase-2 to strengthen the safety parameters of the battery pack.

Features

- Smart battery management system with state-of-the-art ML based algorithms
- Supports all lithium-ion chemistries
- CAN 2.0B communication with SAE J1939 protocol
- Active GPS + 4G enabled IoT gateway available
- Fully configurable 24 parameters (cutoff limits as well as release times, and more) over a web-based configuration tool
- Onboard pre-charging function available
- 7 temperature sensors for the battery pack and 2 temperature sensors on board
- Remote diagnostic capabilities which comes with on-field diagnostic Battery Buddy™ tool
- State-of-the-art SOC estimation using Vecmocon's proprietary “Dynamic state of charge” algorithm.
- BLE enabled

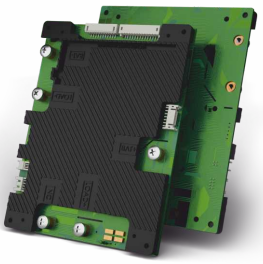
BMS (Battery Management System)

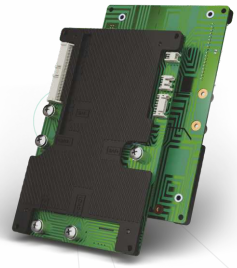




Technical Specifications

Parameter	BMS24S80Amp	BMS16S80Amp
Number of Cells	17 - 24 cells in series	13 - 16 cells in series
Cell Voltage Sensing Range	1.6 - 4.5 V	1.6 - 4.5 V
Cell Voltage Sensing Accuracy (0°C - 60°C)	±10 mV	±10 mV
Dimension	150 mm x 120 mm x 16 mm	162mm x 105mm x 16mm
Current Consumption (Normal Mode)	20 mA	20 mA
Current Consumption (Sleep Mode)	1 µA	1 µA
Continuous Discharge/Charge Current	80 A	100 A
Peak Discharge/Charge/Regeneration Current	100 A (for 30 seconds)	120 A (for 30 seconds)
Balancing Current	Upto 200 mA	Upto 200 mA
Temperature Range	-10°C to 120°C	-10°C to 120°C

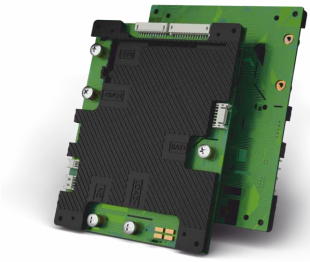




Technical Specifications

Parameter	BMS24S60Amp	BMS16S60Amp
Number of Cells	17 - 24 cells in series	13 - 16 cells in series
Cell Voltage Sensing Range	1.6 - 4.5V	1.6 - 4.5V
Cell Voltage Sensing Accuracy (0°C - 60°C)	±10 mV	±10 mV
Dimension	150 mm x 120 mm x 12 mm	162 mm x 105 mm x 11 mm
Current Consumption (Normal Mode)	20 mA	20 mA
Current Consumption (Sleep Mode)	1 µA	1 µA
Continuous Discharge/Charge Current	60 A	60 A
Peak Discharge/Charge/Regeneration Current	70 A (for 30 seconds)	100 A (for 30 seconds)
Balancing Current	Upto 200 mA	Upto 200 mA
Temperature Range	-10°C to 120°C	-10°C to 120°C

BMS (Battery Management System)



Technical Specifications

Parameter	VEC24S50A
Number of Cells	17 - 24 cells in series
Cell Voltage Sensing Range	1.6 - 4.5 V
Cell Voltage Sensing Accuracy (0°C - 60°C)	±10 mV
Dimension	150 mm x 120 mm x 12 mm
Current Consumption (Normal Mode)	20 mA
Current Consumption (Sleep Mode)	1 µA
Continuous Discharge/Charge Current	50 A
Peak Discharge/Charge/Regeneration Current	70 A (for 30 seconds)
Balancing Current	Upto 200 mA
Temperature Range	-10°C to 120°C

Applications

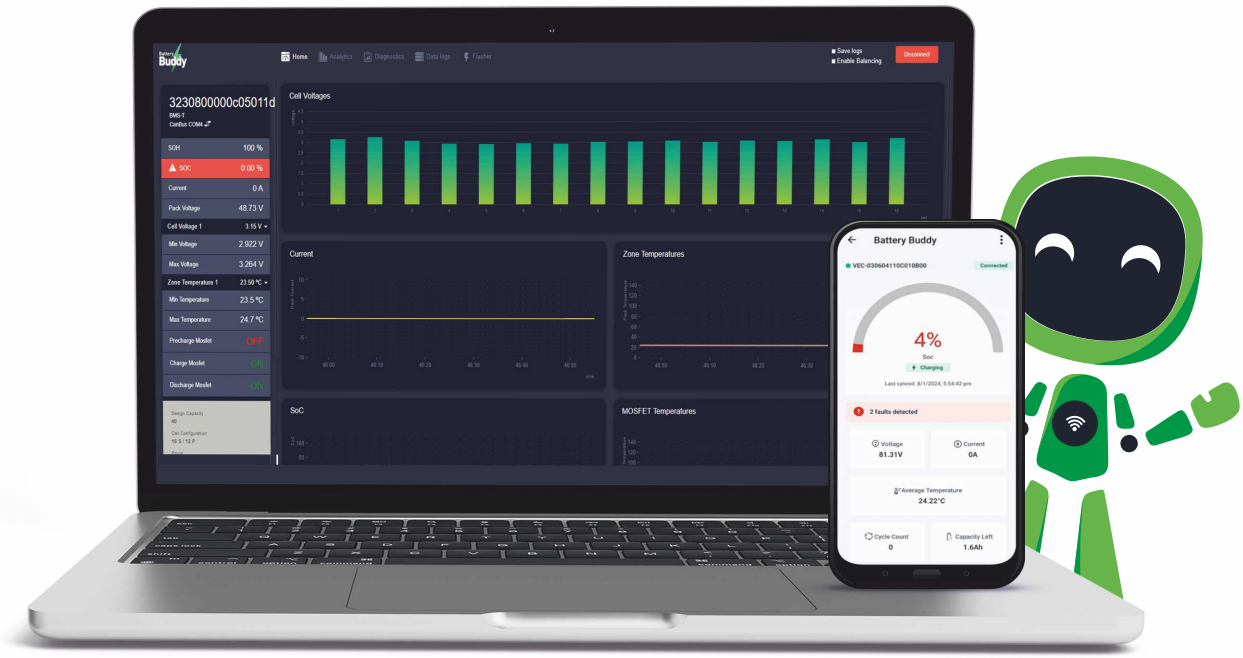
- Electric and Hybrid vehicles, motorcycles, scooter and E-Rikhshaws
- Stationary Industrial and Home storage
- Backup and Standby Battery Systems
- Telecom and Cell Sites

Supporting Software

- Battery Buddy™ tool for laptop and mobile
- Battery configuration tool

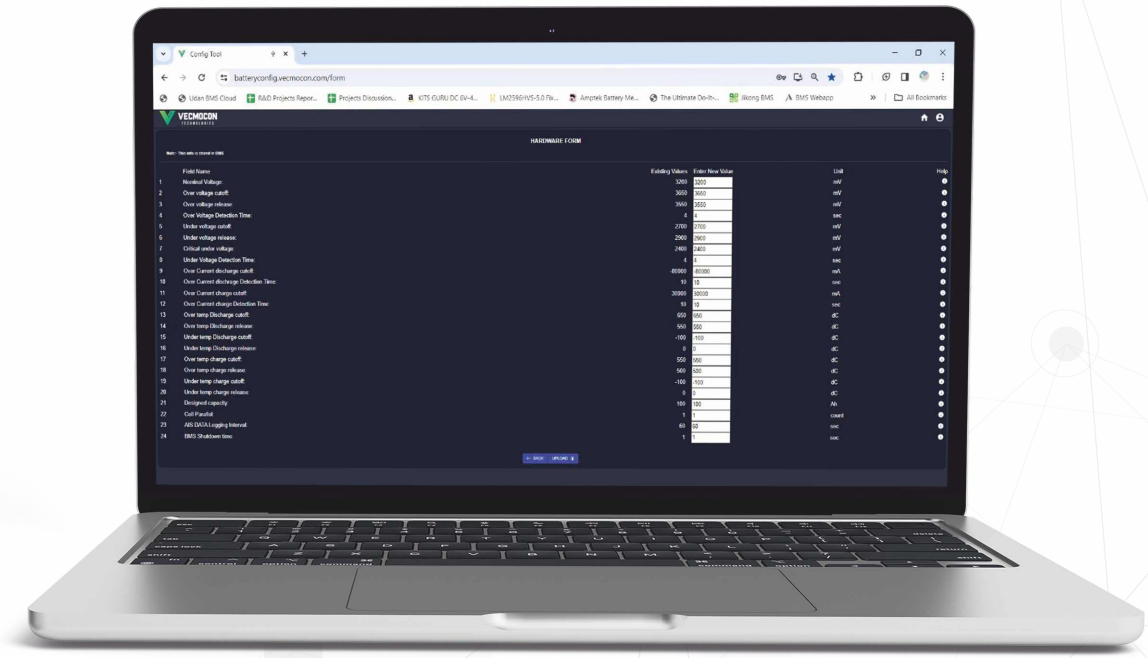
Battery Buddy Tool

Companion application for viewing Battery Data via CAN 2.0B



Battery Configuration Tool

Supporting application to configure 24 parameters of the Battery Pack



Smart Chargers

Description

The chargers can operate on single-phase mains supply 110Vac – 285 Vac with a power factor of more than 0.98 and harmonic distortion (THD) less than or equal to 5%. The system efficiency that can be achieved with this board is more than 92.0% at full load and mains voltage above 180 Vac.

Features

- Based on PFC and LLC topology
- 7 Segment LED indicator for battery status, charging, error, and fault indication
- Charger over-voltage cut-off at Input/Output
- Time-based charge cut-off function
- Soft start function every time the charger is connected for charging
- Earth leakage detection
- CAN J1939 protocol to communicate with BMS
- Pre-charge Function to detect the over-discharge condition of the battery
- Input supply variation protection, output voltage, and current regulation
- Compact design with the forced cool system using DC Fan
- Charge voltage cut-off to avoid overcharging
- Output is CV-MCC controlled by Li-ion charging profile
- Protection against reverse polarity, short circuits, and over-temperature
- Output current is derated when connected to less than 180 Vac to reduce stress on input circuitry and prevent nuisance breaker trips
- AIS 156 Phase-2 compliant
- Supports Standard and Extended CAN 2.0B
- Supports MODBUS with proprietary communication protocol

Smart Chargers

Technical Specifications

Parameter	Symbol	750W	1.5kW
AC Input Voltage Range	Vin_range_AC	110 VAC - 285 VAC	110 VAC - 285 VAC
Nominal AC Input Voltage	Vnom_AC	230 VAC ± 5 VAC	230 VAC ± 5 VAC
Nominal AC Input Current	Ain_nom	3.5 ±0.5A	8 A ± 0.5 A
Maximum AC input Current	Amax	6A	10A ± 0.5 A
AC Line Frequency Range	Hz	47 Hz - 63 Hz	45 Hz - 55 Hz
Power Factor	PF	PF > 0.98	PF > 0.99
Harmonic Distortion	THD (%)	THD ≤ 5.0%	THD ≤ 5.0%
Efficiency (at Full Load)	ŋ	ŋ > 95.0%	ŋ > 92.0%
Efficiency (at Half load)	ŋ	ŋ < 92.0%	ŋ < 92.0%
Minimum DC Output Voltage	VO_min	35 ± 0.5 V	42 ± 0.5 V
Maximum DC Output Voltage	VO_max	88 ± 0.5 V	58.1 ± 0.5 V
Nominal Output Current	A_nom	As per CAN data ± 0.5 A	As per CAN data ± 0.5 A
Nominal Output Voltage	V_nom	As per CAN data ± 0.5 V	As per CAN data ± 0.5 V
Maximum Output Current	IO_max	15 ± 0.5 A	20 ± 0.5 A in CAN
			16A ± 0.5 A in Non-CAN
Maximum Output Power	PO_max	900 W	1500 W

Applications

- Electric 3-wheelers
- Electric 2-wheelers
- Light Electric Vehicles
- Swapping stations

VIM (Vehicle Intelligence Module)

Description

Security and advanced processing are paramount features of Vehicle Intelligence Module (VIM). It receives/delivers secure OTA updates, ensuring the system remains current and performs at its best. The module can execute on-device machine learning algorithms, enabling local data processing for faster and more efficient operations. By enabling key features and functionalities, it enhances user convenience and contributes to a more positive overall experience for electric vehicle owners and fleet owners.

Features

- Remote diagnostics via vec-tr.ai
- CAN 2.0 (standard & J1939 stacks supported)
- Multiple low power saving mode with upto 10x lower consumption
- Asset immobilization
- Geolocation & geofencing
- Internet communication is secured via TLS v1.2 and AES-256
- FOTA enabled
- BLE, SMS, CAN-based configuration & diagnostics
- Tow, free fall, harsh acceleration event detection
- Protection circuits (reverse/overvoltage/short-circuit etc)
- Internal battery (optional)
- Payload optimization for minimal recurring cost
- No loss data delivery via onboard logging

VIM (Vehicle Intelligence Module)

Technical Specifications

Parameter	Symbol	V1.x	V2.x
Power Supply	V	9-90	9-90
Operating Temperature	C	-10 to 75	-10 to 75
Dimension	mm	90 x 59.5 x 26	79 x 42 x 25.5
Current Consumption (Nominal)	mA	18	20
Current Consumption (Sleep)	uA	<500	<500
Memory	MB	1	4 (Ext. up to 16)
Internal Battery	mAh	NA	750 (Ext. up to 1000)
IMU	NA	NA	6 Axis (Acc + Gyr)
GPIO	NA	0	4 (Programmable as IO)
Analog Input	V	NA	9-90 (1 AI)
Cellular Technology	NA	4G/2G	4G/2G
GNSS	NA	GPS+BeiDou	GPS+BeiDou
SIM	NA	e-Sim	Micro/e-Sim
GNSS Antenna	NA	Active	Passive/Active

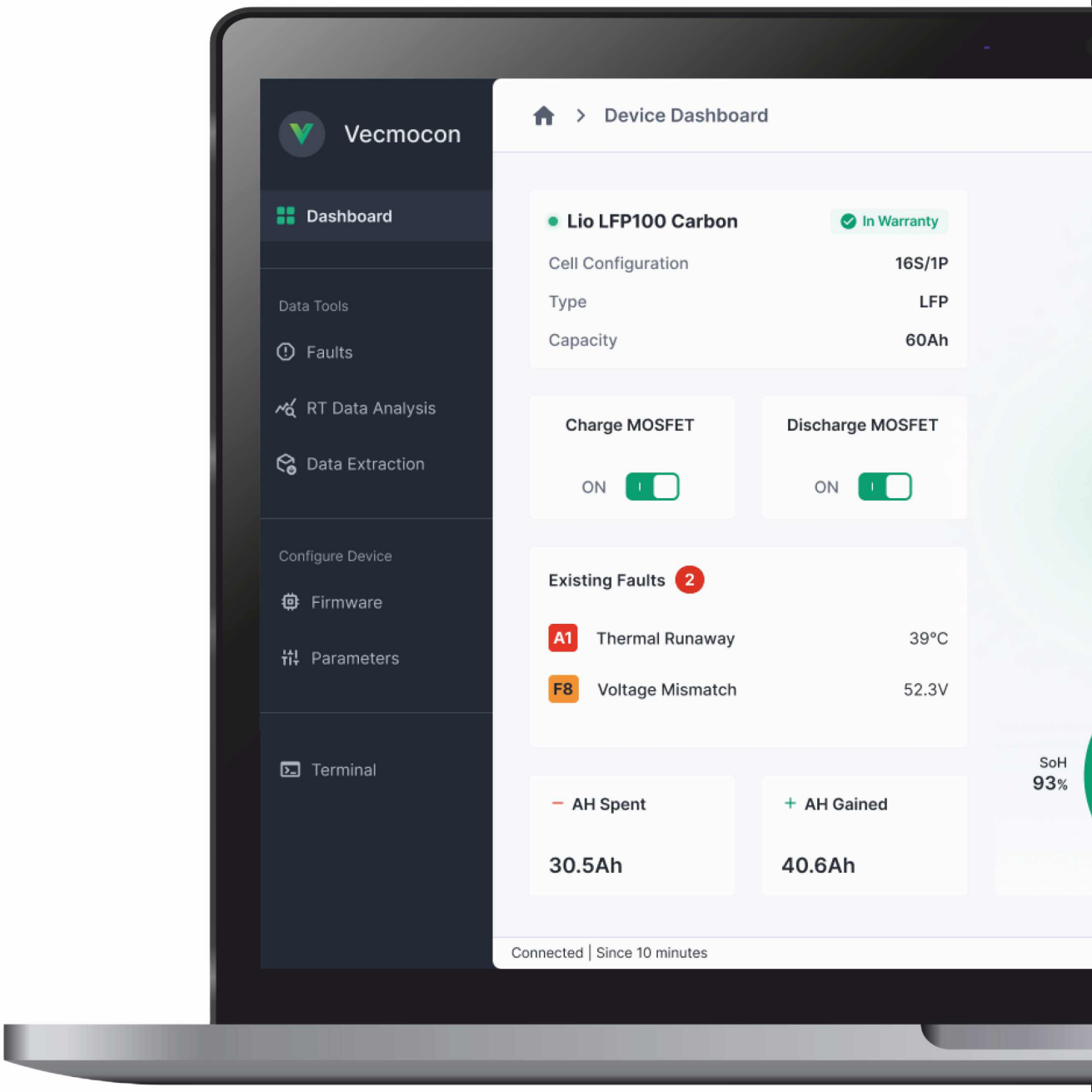
Software

Model Based Software Development	Software developed with Tools like MATLAB
Configuration And Firmware	FOTA WEB (cloud-based solution), Configurator (USB, CAN)
Scenarios	On edge Geofence/Trip evaluation
Protocols	UDS/TCP/MQTT/SMS/NMEA
Data Sending	Main, Duplicate and Backup servers
Security	SSL/TLS v1.2, CRC32 and Hashing for verification and validation

Applications

- Electric and Hybrid 3 wheelers, motorcycles, scooters, logistic vehicles, AGVs, Smart batteries
- Shared Mobility and fleet operations
- Vehicle Leasing operations
- Battery Leasing operations (BaaS)

VEC-TR



Real-time and Historical GPS Data Collection

Capture and access precise GPS data both in real-time and from historical records.

Geofence Breach Alerts

Instant notifications for any geofence breaches,
ensuring immediate response to boundary violations.

Aggregate Analytics for Various Players

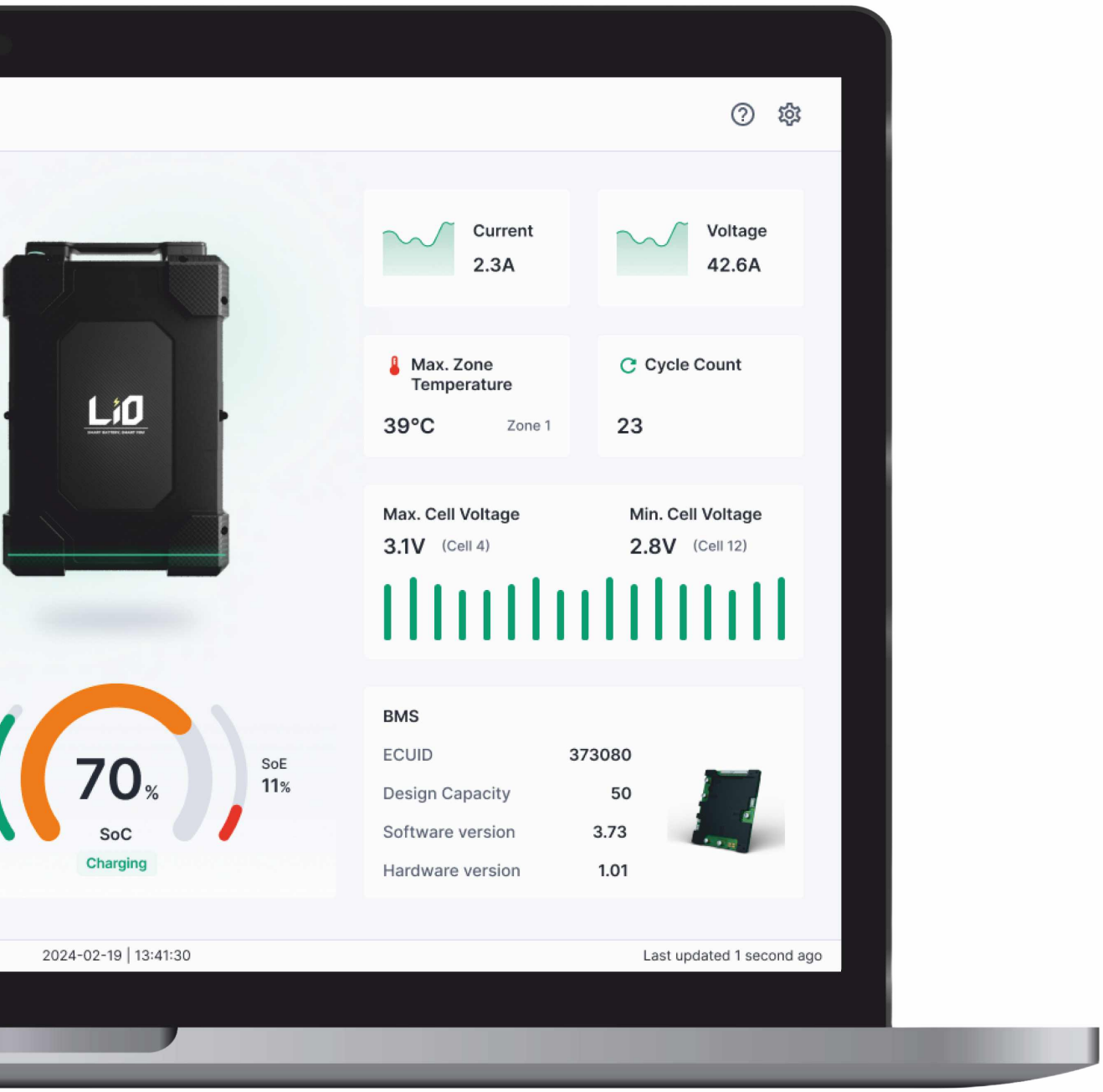
Comprehensive analytics that provide valuable insights
and comparisons across multiple users and devices.

Diagnostic Data Collection

Collect in-depth diagnostic data to monitor system health and predict maintenance needs.

Remote Configuration

Effortlessly configure & manage devices remotely, reducing the need for on-site interventions.



Self and Sub-system FOTA (Firmware Over-the-Air)

Seamlessly update firmware for both main systems and sub-systems remotely, ensuring optimal performance and security.

Long-term Data Storage (+1 year)

Reliable storage solutions for retaining data for over a year, ensuring compliance and availability for analysis.

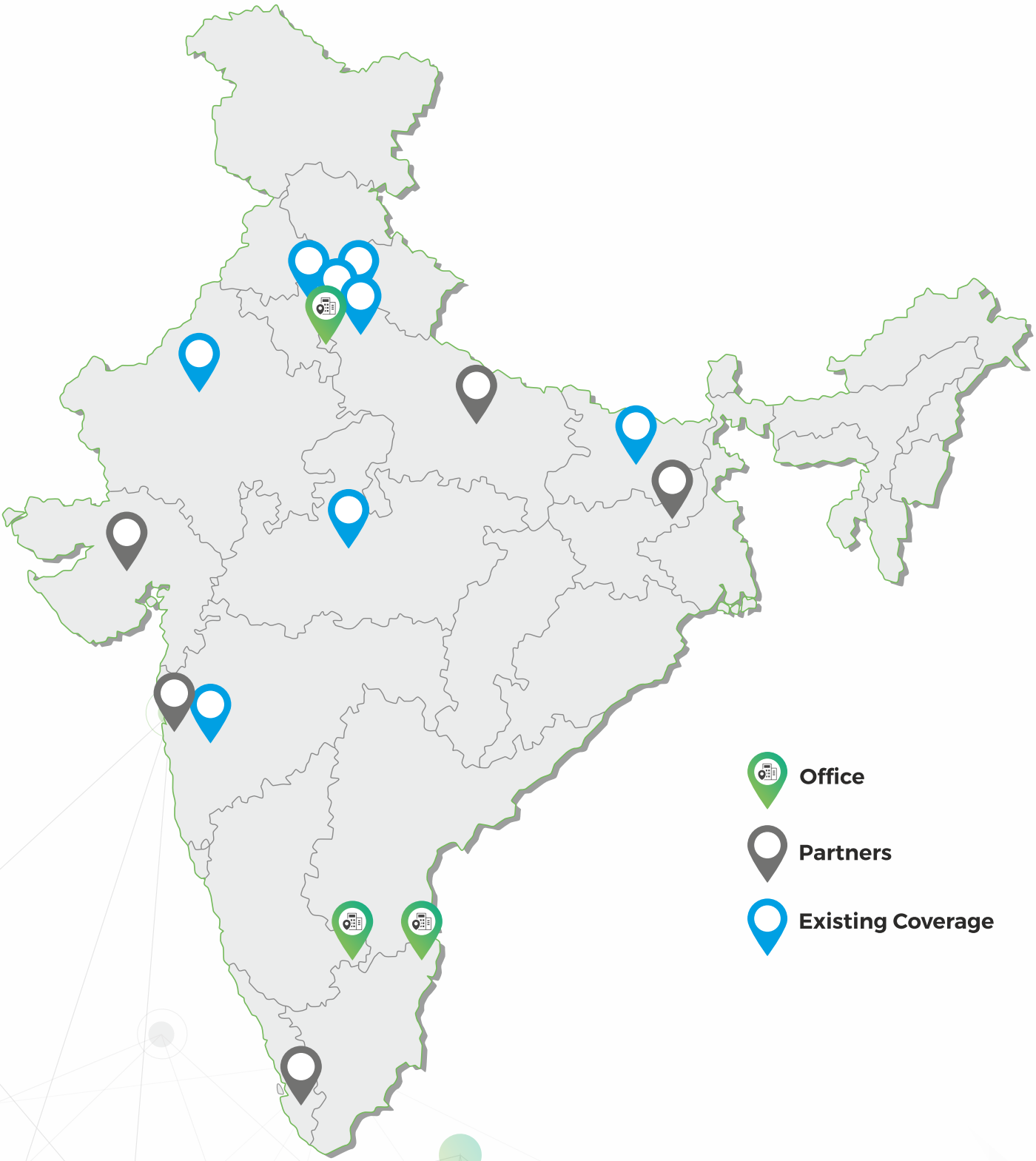
AES Encrypted Data Transfer

Secure data transfer with AES encryption to protect sensitive information from unauthorized access.

Report Generation

Automated and customizable report generation to easily visualize and interpret data trends and metrics.

Vecmocon Footprints



CONTACT US

www.vecmocon.com