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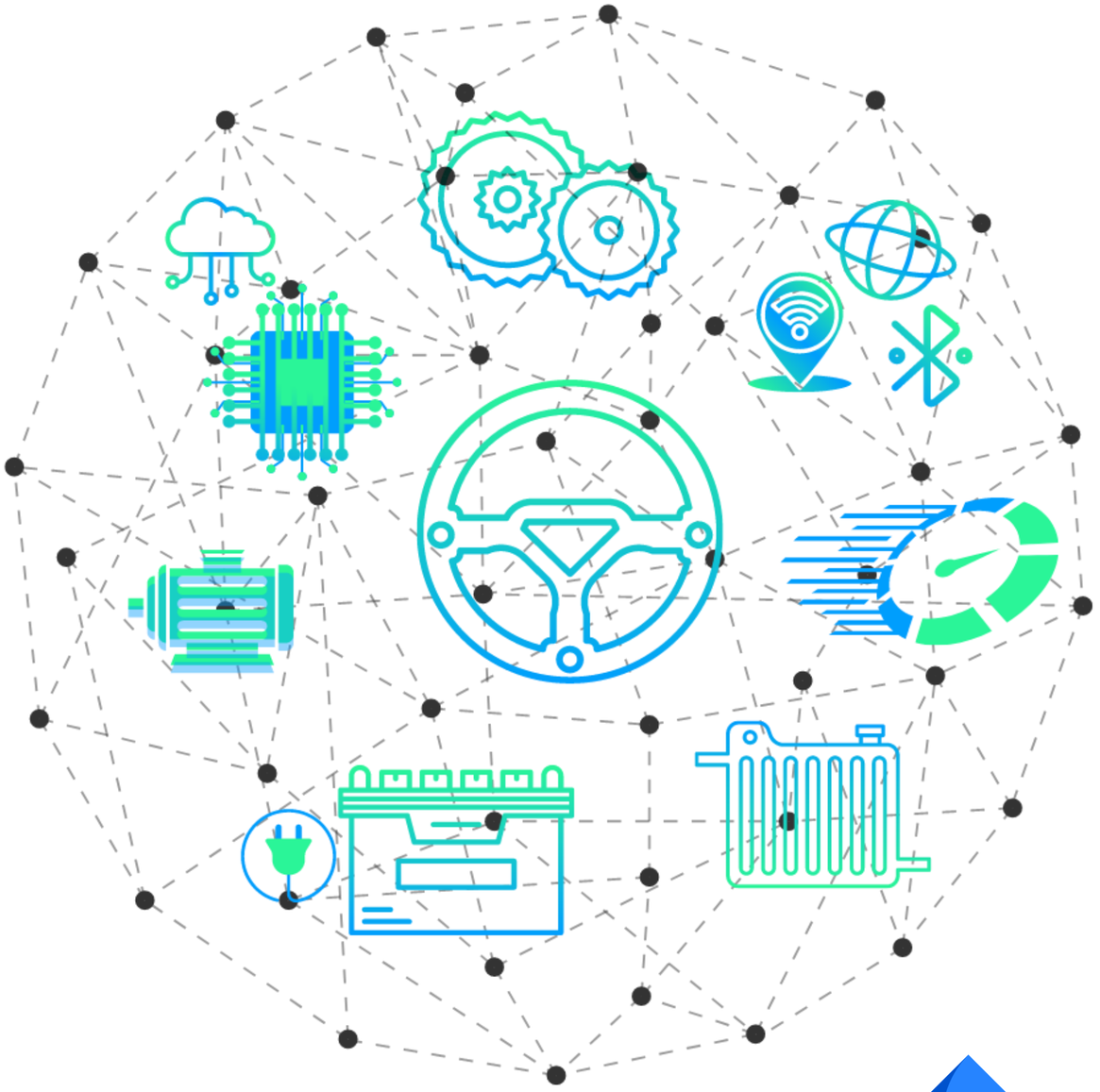
Devise Electronics

Your Development Partner Since 2013



www.deviseelectronics.com

- **Incorporation**

  2013– Proprietorship
  2015- Private Limited Company

- **Business domains**

  Embedded Products
  e-R&D + Systems Engineering
  E Mobility Lab Development
  Technical Consultancy
  Product Representation
  Mobility Skill Development

- **Clientele**

  India
  Middle East
  Europe
  USA

- **Special Initiatives**

  REPARO – Diagnostic Tool & Platforms

Vision | Mission | Values

To be your global mobility solutions partner

- End-to-End support
- Quality products
- Flexibility
- Agility

Devise sustainable and innovative technology-oriented products and solutions for evolving mobility landscape

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- Innovation
- Focus
- Quality
- Commitment

SHEKHAR MALANI
Managing Director
20+ years Automotive Electronics experience

Core Team

SWAPNIL TIKLE
Business Development
Product & Services

VIKAS SHIROLKAR
Head-Labs &
Industrial Trainings

ROSHAN KHADSE
Technical Program
Manager

FAIZ KHAN
Sr. Engineer
Simulation & CAE

SUMEDH PISE
Technical Product
Manager

VIVEK JADHAV
Tech Lead-
Embedded Software

ARUNA BABAR
Chief Engineer Embedded
Hardware

PRADNYA LAD
Human Resources

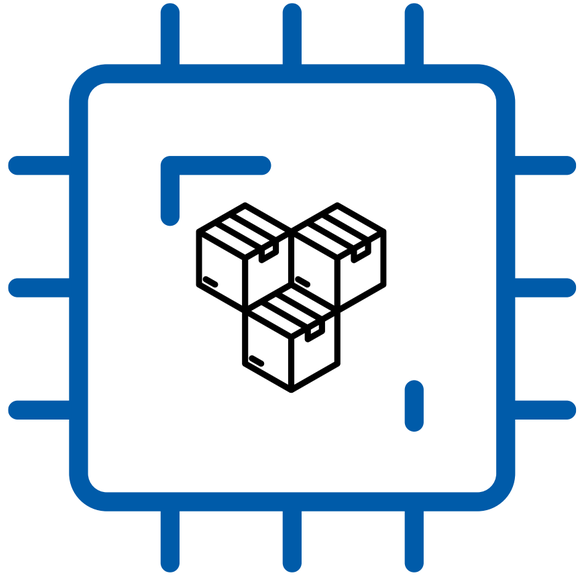
AMRUTA GAVADE
Operations Head Training
Vertical

SUMEGH KADAM
Business Development Lead
(EUROPE)

GORDON WALKER
Business Development
Global Market

GEORGE VUKOJICIC
Business Development Lead
(EUROPE)

Embedded Products



Automotive Products

VCU (Vehicle Control Unit)

- deVCU S-Lite

- deVCU N-Lite

- deVCU

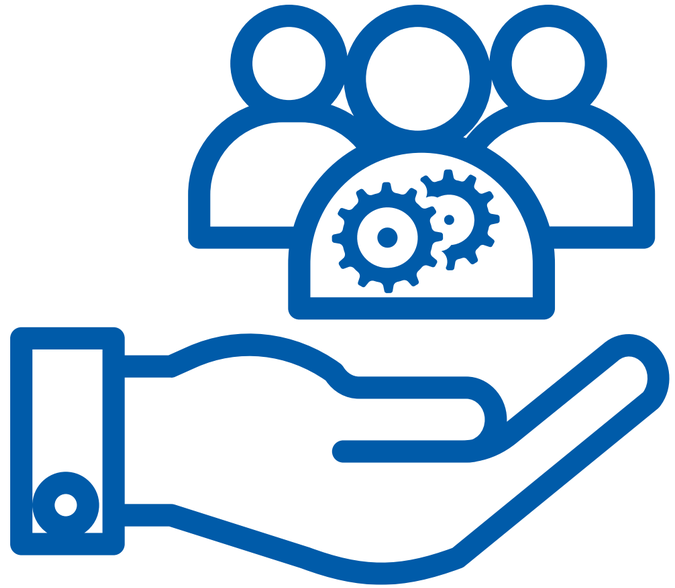
IOT & Telematics

- deIOT4G-1C

- deIOT4G-3C

MAKE IN INDIA

e-R&D + Systems Engineering

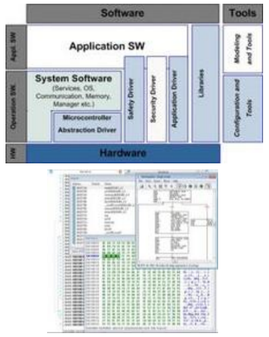


Embedded Electronics

Embedded Hardware

- Hardware Architecture Schematics
- Circuit Simulation
- PCB Design
- Prototyping
- BOM Management Validation Testing
- DFM, DFA

Firmware Engineering



- Bootloader Development
- Device Driver Development
- Application & Diagnostics Development
- Code Porting
- Library Development
- Documentation

Connectivity Solutions

- BT/BLE, Wi-Fi, LoRA
- NFC/RFID
- 3G/LTE/GPS
- LIN/CAN
- USB/Serial/Parallel
- Edge, Server and Cloud Integration
- Data Analytics
- Cloud Dashboard

System Development

- Prototype Build
- Hardware Mechanization
- System Level DFMEA
- Functional Safety
- Security
- Product MDS documentation
- VAPT Testing

Validation & Verification

- DVP & R
- Engine Durability and Emissions Testing
- Vehicle Indoor and Outdoor Testing
- EMI/EMC Validation
- Mechanical Validation
- Environmental Validation

Model Based Development

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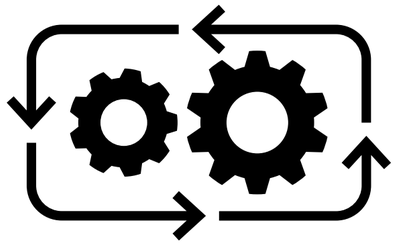
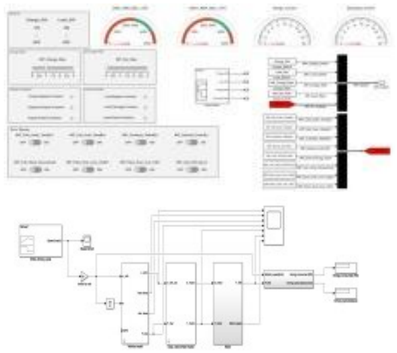
Worflow



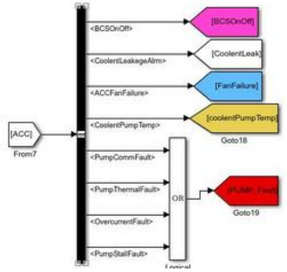
- Gather requirements and analyze the inputs.
- Decide control strategy for the inputs.
- Form a model with the required specifications.
- Simulate the model.
- Validate data based on the relevant physical system

Parameterization



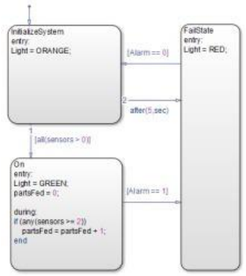
- Develop Features and Functions
- Evaluate physical system performance.
- Calculate component specification based on the performance
- Determine dependency of the component's specifications on the overall system.

System Validation



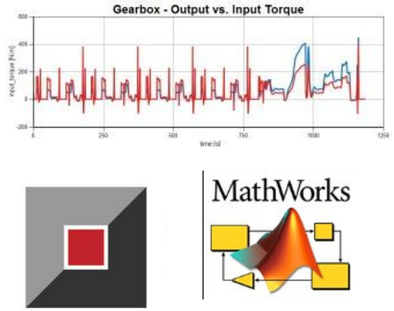
- Establish Traceability between the Model and the Code.
- Determine that the Code executes properly in its final Software and Hardware environments.
- Involve Model checks as well as SIL, PIL & HIL Testing.

Embedded Application



- Reduce dependency on the Development environment and Protocols.
- Custom toolboxes for the controller family and architecture.
- Seamless Application flashing on the Hardware

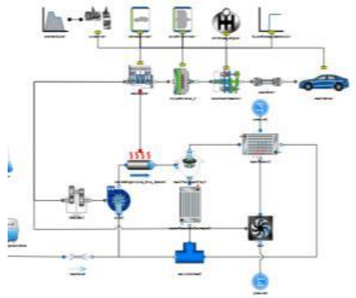
Software Interoperability



- Utilize features of various tools.
- Produce precise results to that of real time.
- Maintain the Simulation Model in a single tool.
- Reduce Development time for custom code of a block that is already available.

Engineering Services

System Design

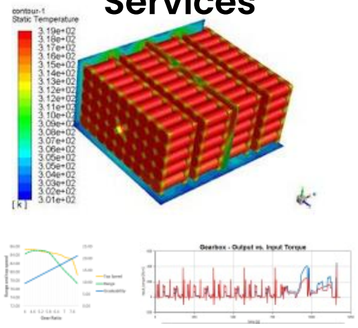


- XEV System Design
- Test System Design: after-treatment,
- Component Sizing
- Defining Boundary Conditions
- System Specification
- Component/System Architecture detailing
- Design for Certification
- D/PFMEA

Component Design

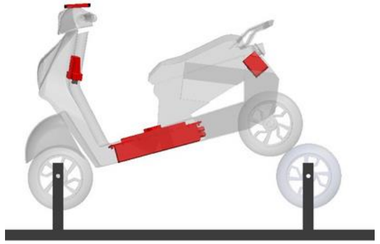
- Component Sizing and selection
- Advanced techniques like Simulink model
- Prototyping
- Component Sourcing
- Component Sourcing
- Design for certification
- DFM, DFA, DFS
- FMEA
- Ex. REESS, PDU, Custom Hardware etc.

CAE Services



- CAD and CAE support
- Physics based modeling in Simulink
- 1D simulation using GT Suite
- Design Optimization
- Data collection / Analysis / Forecasting
- Vehicle performance prediction: max speed, acceleration, gradeability

Integration



- Vehicle Integration
  - Controller/Hardware: Battery pack, VCU, BMS, OBC, etc.
  - Mechanical integration
  - 2-wheeler, 3-wheeler, 4-wheeler (Passenger and commercial vehicles)
- Vehicle Retrofitment with XEV Powertrains
- HV&LV Harness Development
- Diagnostic Troubleshooting Trees

Testing & Validation

- System & Component level
- Test & validation layout
- IS, AIS, DNV-GL etc.
- Test Rig Development
- Homologation spec validation

Data Engineering & Science

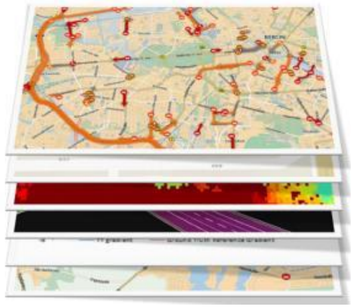
Data Collection

- Live Tracking
- IoT Enablement
- OBD and CAN Data
- Fuel and Driver Behavior Monitoring
- Server and Cloud Setup
- Data Validation
- Data Security

Data Analysis

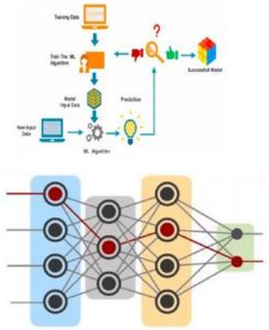
- Feature Extraction
- Clustering and Profiling
- Sorting
- Data calibration
- Data synchronization
- Thresholds
- Trends

Data Fusion



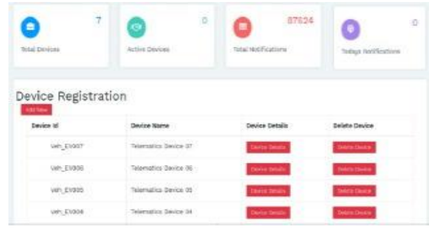
- GNSS/IMU Fusion Systems
- Competitive Fusion
- Distributed and Centralized Architecture

Decision Making



- Neural Nets
- Hierarchical Decision Making
- Redundancy
- Collision Avoidance
- Integration with Robot Operating System (ROS)

Data Dashboard



- Cloud Dashboard
- Login Authentication
- Data Visualization
- Device Management and Administration

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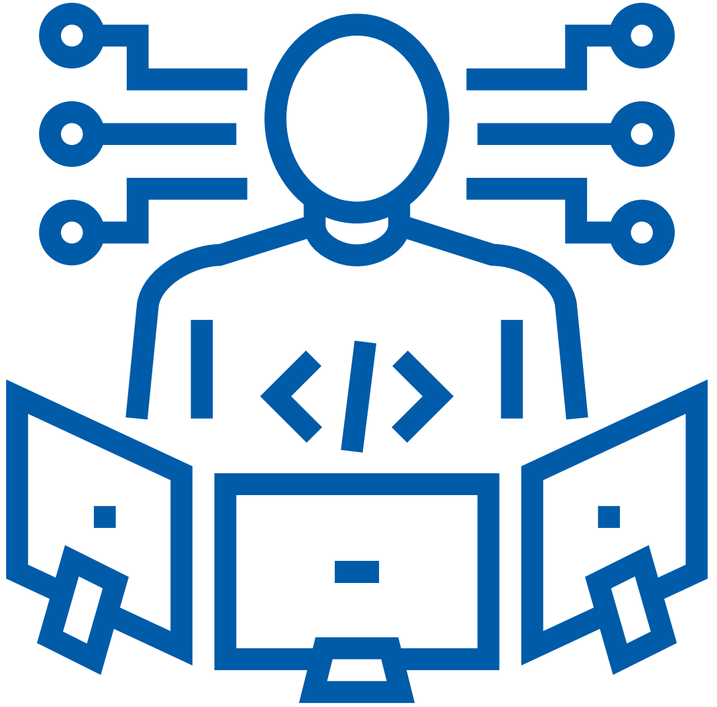
E Mobility Lab Development



E Mobility Lab Development

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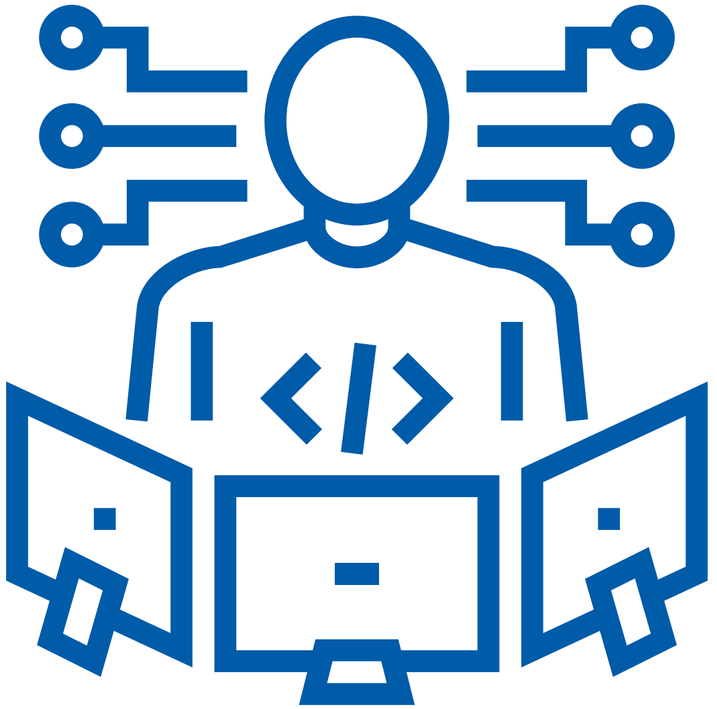
Technical Consultancy



Technical Consultancy

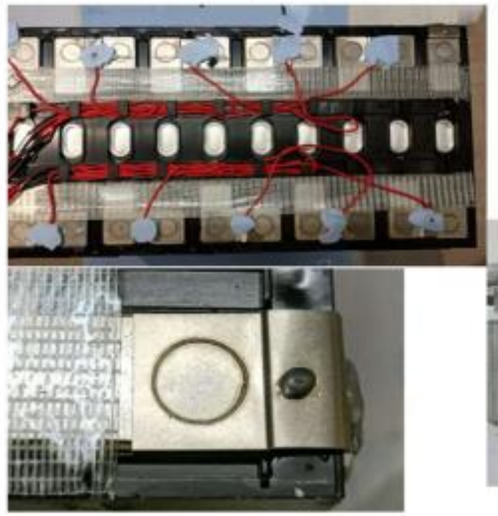
Technical Assessment / Due Diligence Projects Undertaken

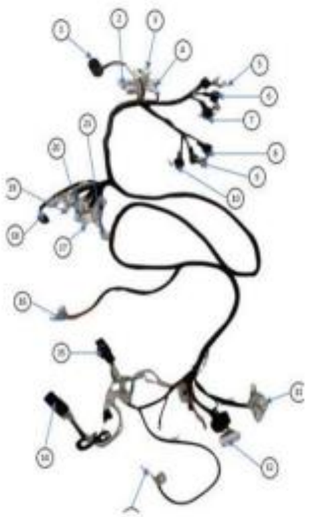
DOMAIN	Details	No. of Projects Undertaken
Vehicle &/or Component Teardown & Benchmarking	EV 2W, Type-2 AC Chargers, Hub Motors, PMSM based e-axle	12
New Technology Assessment, Due Diligence &/or Evaluation	Alternate Battery Chemistry, OTA based Diagnostics Platform, Motor Companies for a traditional Tier 1, Pedelec MCU Company	14+
Facilitation of J-V, Technology Transfer Partnerships	J-Vs between Motor Tier 1 & EMS vendor, Between BMS Tier 1 & EMS, Between BMS Tier 1 & ESS Supplier	8
Safety Audits	Plant safety audits. Build, Process and Operations	5+

Benchmarking | Teardown

- Performance Evaluation on Chassis Dyno
- On-road testing loop (DTE, Charge Retention, Accuracy of Display, Thermal Performance)
- Benchmarking (Subjective and Objective for 6 2W EV's on sale today)
- BOM Costing Comparison
- Teardown:
  - All powertrain components
  - Wiring & Connector Quality Assessment
  - Vendor tra

Sr.No	Parameters
1	Looks/ Aesthetics
2	Ride comfort/ Ergonomics
3	Pillion Comfort
4	Performance
5	Braking
6	Passive Safety
7	Cluster/ HMI
8	Convenience
9	Connectivity
10	Charging
11	Storage/ Boot Space
	OVERALL





Sr. No	Parameters
1	Subjective Evaluation
2	Acceleration Performance
3	Braking Performance
4	Gradeability Performance
5	Charging Ecosystem
6	Range (Claimed vs. Obtained)
7	Battery Pack
8	BMS
9	Motor & MCU
10	Wiring Harness & Power Electronics.
11	HMI
	Overall

Product Representation

Lithium Balance

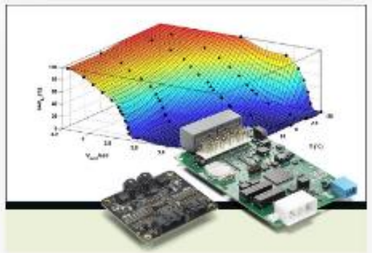
Battery Management System

Lithium Balance has been involved in battery development since 2006.
Devise is an Indian Authorised Distributor & Application Partner for Li-Bal.

s-BMS™

MAIN FEATURES:

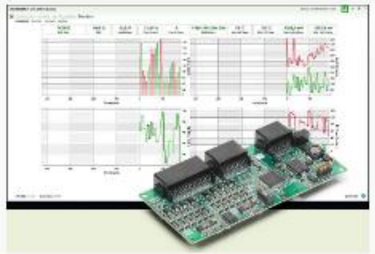
- Distributed system
- 8 voltage channels per slave
- 256 cells in series
- 2 temp. channels per slave
- 12 – 1000 V
- 1 CAN channel
- PRO configuration software



n-BMS™

MAIN FEATURES:

- Distributed system
- 12 voltage channels per slave
- 384 cells in series
- 4/12 temp. channel per slave
- 12 – 1000 V
- 2 CAN channels
- CREATOR config. software



c-BMS™

MAIN FEATURES:

- Integrated system
- Up to 24 voltage channels
- 6 temperature channels
- 12 – 100 V
- 1 CAN channel
- CREATOR config. software

s-BPU™

MAIN FEATURES:

- Battery protection with embedded s-BMS
- 8-32 voltage channels
- 24 – 80 V
- 200 – 800 Amp continuos
- 1200 Amp peaking 10 sec.
- PRO config. software

i-BMS™

MAIN FEATURES:

- Integrated system
- Up to 15 voltage channels
- 6 temperature channels
- 17 – 60V
- Parallel pack & Hot Swap functionality
- On-board pre-charge circuit, shunt, battery disconnect, and power supply

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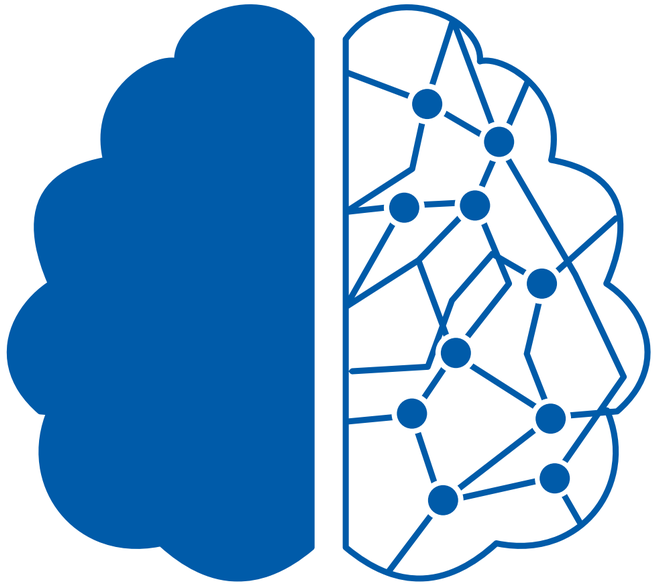
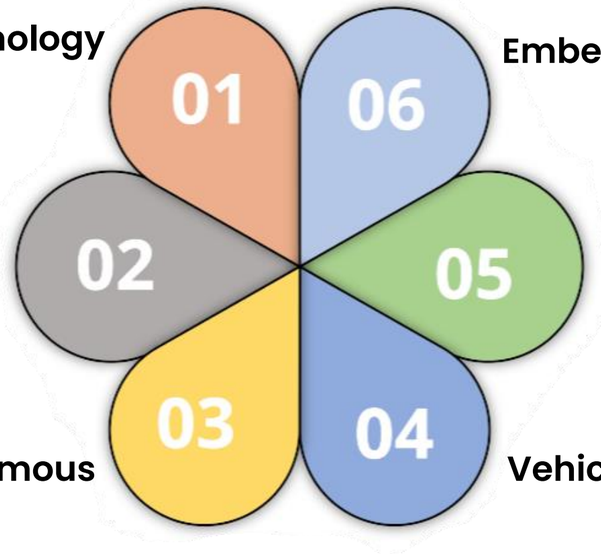
Mobility Skill Development



Training Modules



01 Electric Vehicle Technology

02 Future Mobility – Connected, Shared, Functional Safety & Cybersecurity

03 ADAS & Autonomous Technology

04 Vehicle Engineering

05 IOT & Advanced Computing

06 Embedded Hardware & Software

- Experience of OEM Skill Development
- Expert in Audience Centric Skill Development
- Application Oriented Knowledge Transfer with Hands-on Activities
- Largest Topic Coverage in the Industry
- Strategic Partners for Niche Training Requirements
- Domain Experts as Faculties
- Strong Association with Reputed Educational Institutes across India

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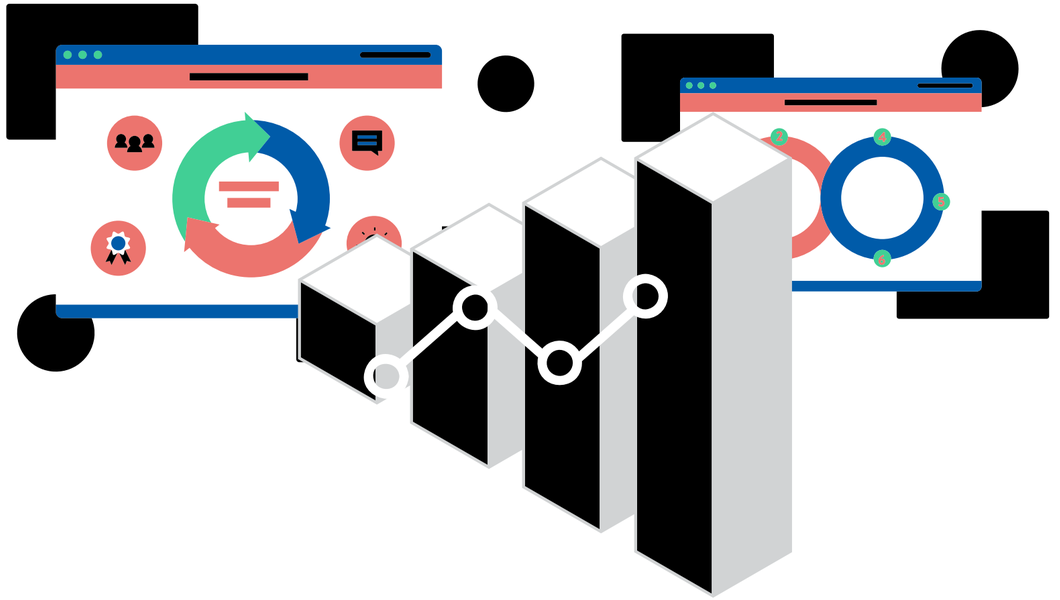
Project Experience



Project Experience

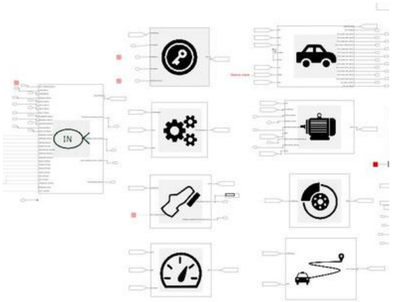
Techno-Commercial Consulting

- EV Industry Entry Point Analysis for traditional Tier 1
- Supply Chain Localization for EV
- JV Setup for Local Manufacturing
- Should Cost Analysis for Motor + Inverter

Embedded Electronics

- UCMS-Ultra Capacitor Monitoring System
- MOSFET based Battery Disconnect Unit
- Master Slave Data Acquisition System

Model-Based Development



- Model based Application software for IC Engine
- Model based on- board diagnostics module and EV
- Low-Cost HIL and Smart Breakout Box

Data Engineering

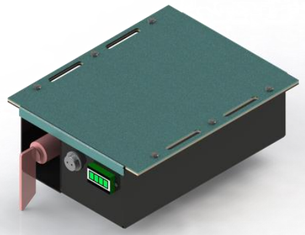
- Devise guided trouble shooting
- EV fleet data analysis
- Perception and localization
- E-catalogue – Augmented reality

Vehicle Integration

- Powertrain integration in LCV
- Battery pack for Hybrid LCV
- VCU integration in Bus
- Powertrain 2W Hybrid EV

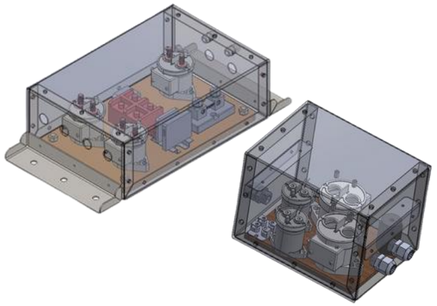
Project Experience

Re-chargeable Energy Storage System



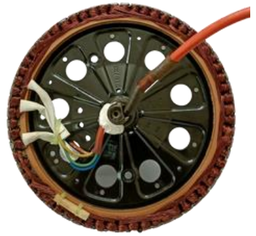
- 2W / 3W- Modular and Swappable Battery Pack
- 350 V Battery Pack for Bus Hybridization
- BMS Integration for battery pack
- Flexible Wiring Harness Integration
- Ultra Capacitor Monitoring System
- Battery Pack for ESS Applications
- Refurbishment of Battery Pack
- Repurposing of Used Li cells

HV Integration



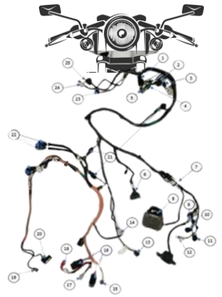
- Power Distribution Box
- 350 V Vehicle Integration for Hybrid Mini Truck
- 350 V– EV integration for Retrofittment
- HV Integration– Electric Bus
- MOSFET based Battery Disconnect Unit
- Contactor Integration
- Smart Disconnect Unit for ESS
- Accessory Power Unit for Recreational Marine Application

Motor & MCU Dev.



- Axial Flux MCU
- Axle Integrated Motor
- Auxiliary Motors for Skid Steer Loaders
- BLDC Motor integration for 2 wheeler with transmission optimization
- Motor/Generator Integration Logic for Hybrid Application
- Performance improvement of Univ. Motor- Vaccum

E/E Interface

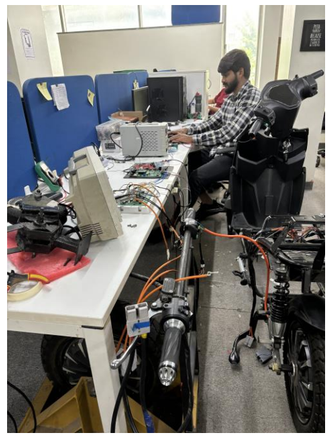
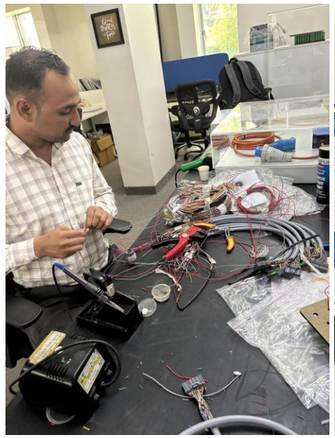
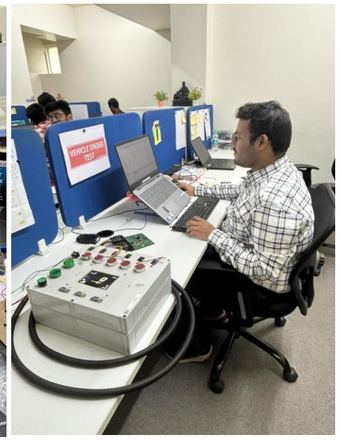


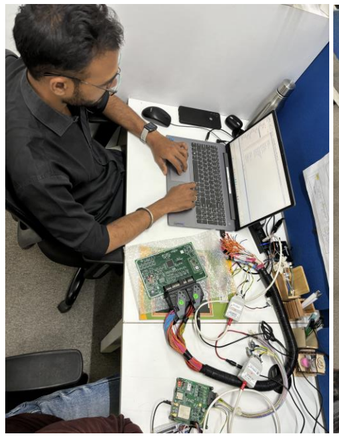
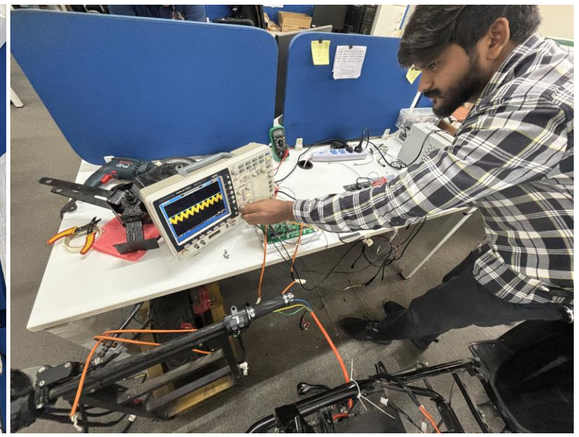
- Electrical Architecture Development for 3- Wheeler
- EMI/C Testing and Validation at Component and System level
- Electrical Architecture for AGV
- EV Retrofitment for Forklift
- Powertrain Integration in LCV
- Battery Pack for Hybrid LCV
- VCU Integration in Bus
- Vehicle Integration for series Hybrid

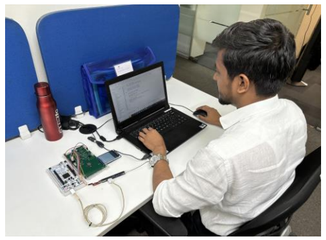
Vehicle Electronics

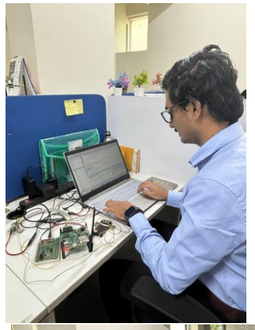
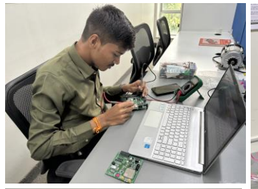
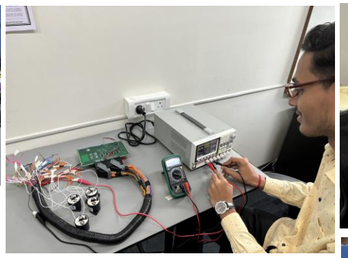
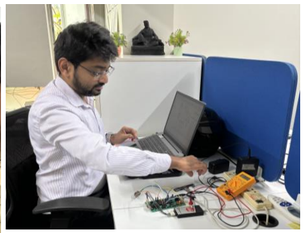
- Smart Dashboard for 2 Wheeler/3 Wheeler
- IoT Enabled Remote Control for EV
- Solar Integration for 2 Wheeler charging
- Retrofitment of existing ECUs with configurable ECUs
- Vehicle Controller for 3 Wheeler Application
- Vehicle Controller Logic for Electric Bus
- Smart Logic for Charging optimization for Forklift

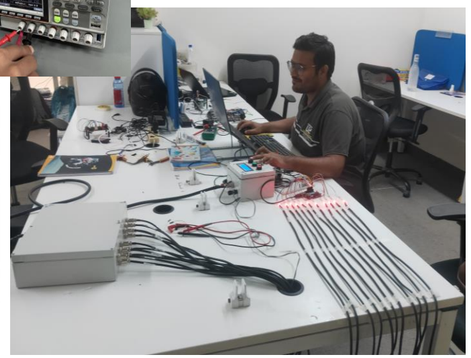
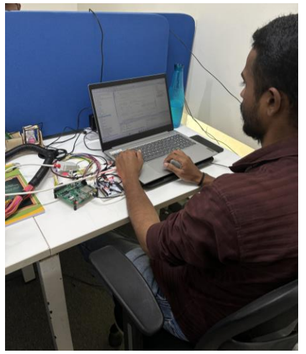
Workplace Glimpse



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