

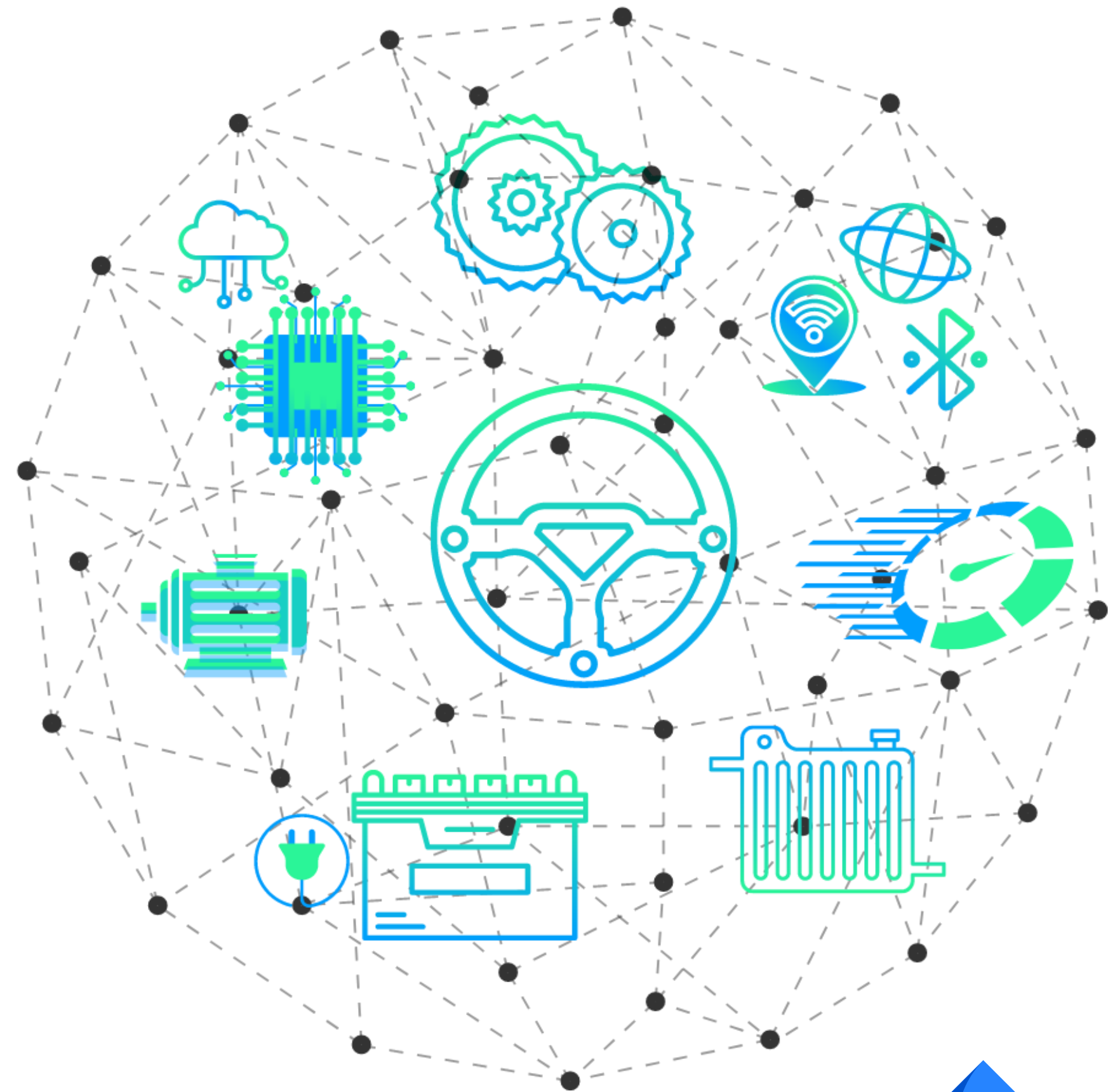
devise | 10 Years Of Excellence!

Devise Electronics

Your Development Partner Since 2013



www.deviseelectronics.com





- **Incorporation**

2013– Proprietorship
2015– Private Limited Company

- **Business domains**

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

- **Clientele**

India
Middle East
Europe
USA

◆ 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

- 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



MANAS VORA

Head – Technical
Operations



ROSHAN KHADSE

Technical Program
Manager



ADITYA JAGTAP

Sr. Engineer
Simulation & CAE



ARUNA BABAR

Chief Engineer Embedded
Hardware



VIVEK JADHAV

Tech Lead-
Embedded Software



SAURABH KULKARNI

Tech Lead – MBD



SAGARIKA PANDE

Lead – Skilling
Operations

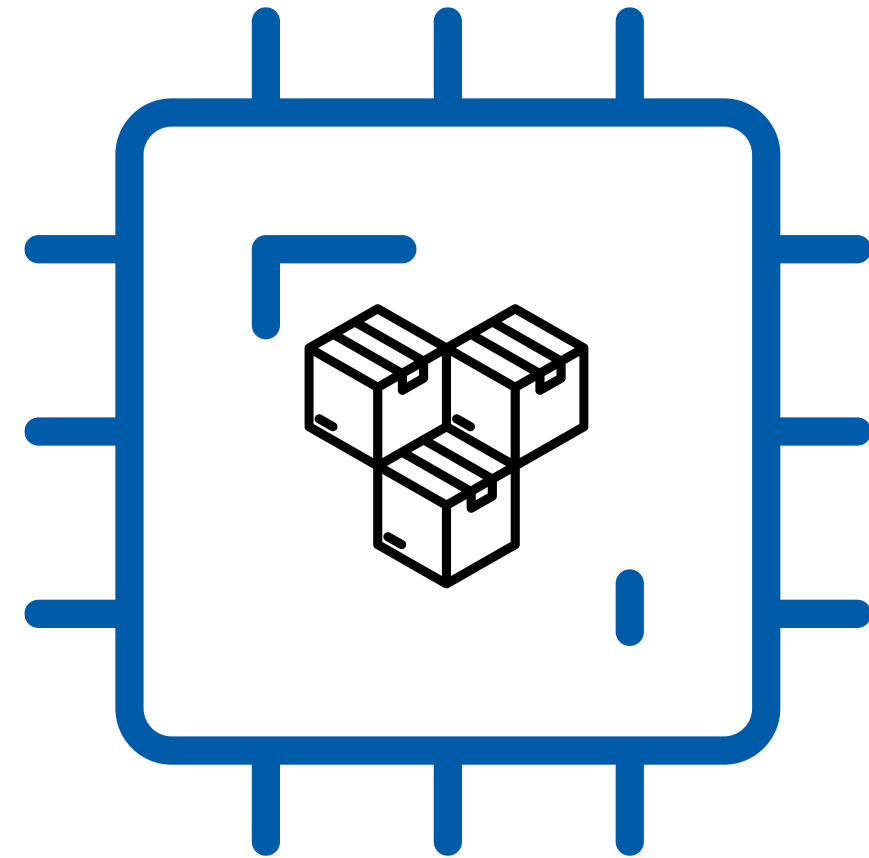


SUMEGH KADAM

Business Development Lead
(EUROPE)



◆ Automotive Products



◆ Automotive Products

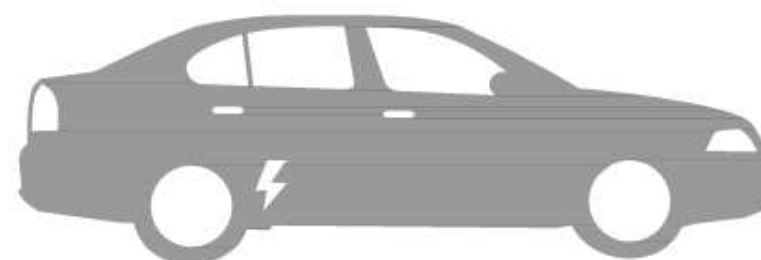
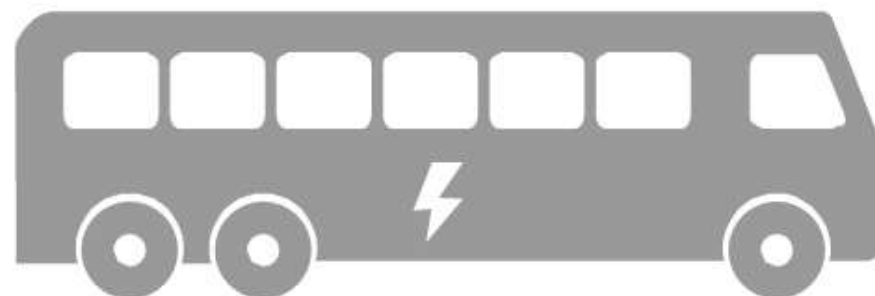
VCU (Vehicle Control Unit)



deVCU



n-lite



◆ Devise VCU on EV Appl.



City Bus

Neuton Auto 12 Meter City bus is a modern electric bus equipped with an efficient system for achieving high endurance battery range on a single charge. When fully charged, the electric bus can travel long distances in city traffic with around 140 passengers. The vehicle can be recharged in a standard way in a depot during shutdown of the vehicle with short charging times. Available in a range of Low floor and Low entry vehicle versions.



devise



Electric Bus with an efficient system for achieving high endurance Battery Range on a single charge

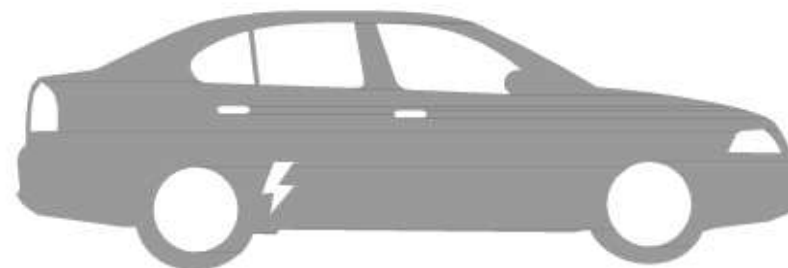
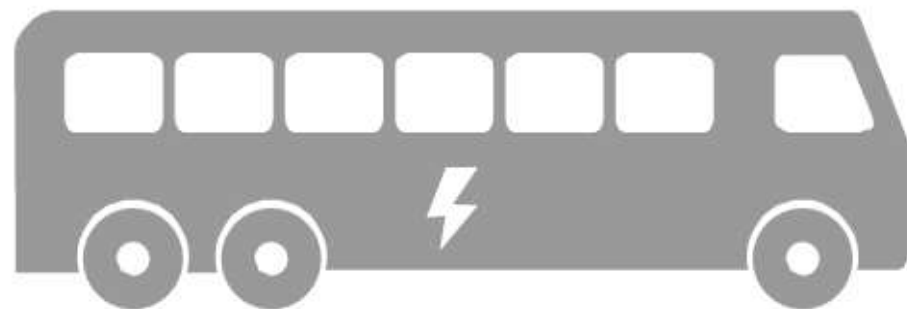
◆ IoT Solutions



deIOT4G-1C



deIOT4G-3C



◆ Diagnostic Solutions



- deCFI

Diagnostics Solution for EV Applications

CAN Fault Injection Tool allows user to inject faults into the CAN bus of any vehicle and aims at providing a test system capable of automatically injecting faults.



- deEOL

Diagnostics & Testing Application

It is an Electric Vehicle Powertrain Control Unit for two-wheelers monitors the entire vehicle powertrain.



- deOBD

Diagnostics- Dongle + App

It allows an On-Board Diagnostics for both EV and ICE platforms by plugging the device into the vehicle's OBD-II port it can monitor, diagnose, and relay data from the vehicle's various systems.





◆ R&D Engineering



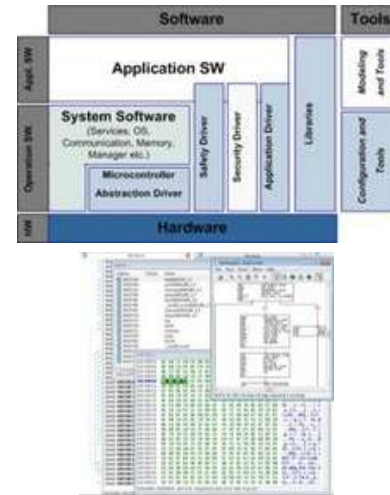
Embedded Electronics

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

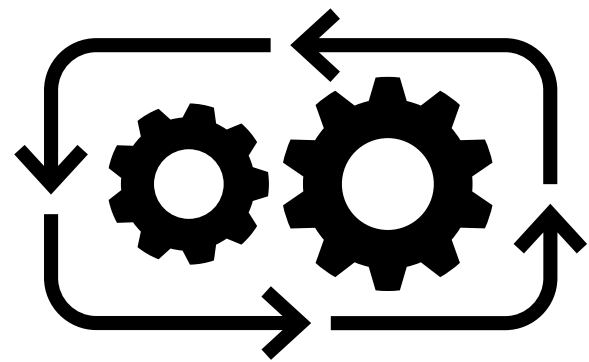
Validation & Verification



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

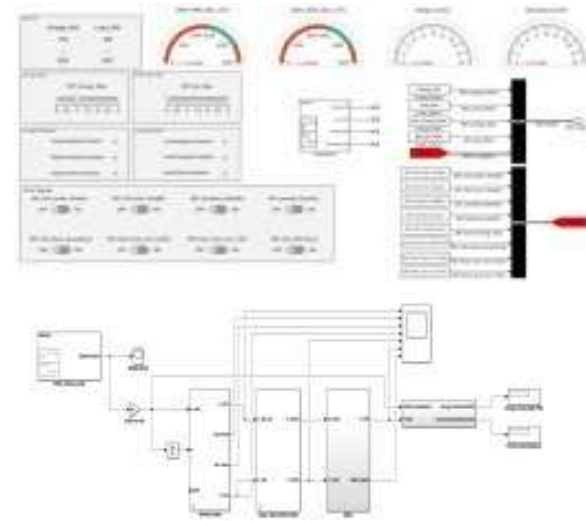
Model Based Development

Workflow



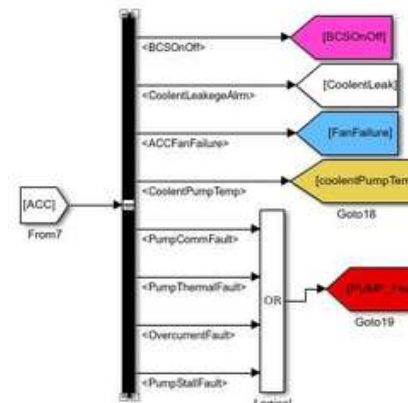
- Gather requirements and analyze the inputs. ☒
- Decide control strategy for the inputs. ☒
- Form a model with the required specifications.
- Simulate the model. ☒
- Validate data based on the relevant physical system

Parameterization



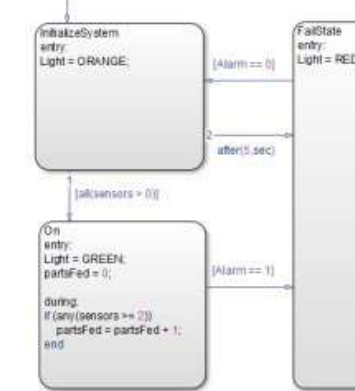
- Develop Features and Functions
- Evaluate physical system performance.
- Calculate component specification based on the performance
- Determine dependency of the component's specifications on the overall system.

System Validation



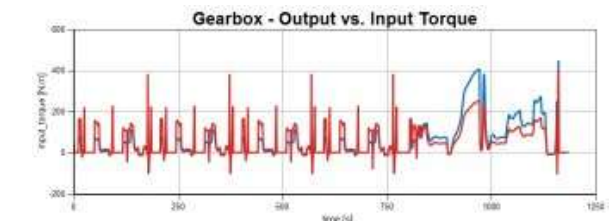
- Establish Traceability between the Model and the Code.
- Determine that the Code executes properly in its final Software and Hardware environments.
- Involve Model checks as well as SIL, PIL & HIL Testing.

Embedded Application



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

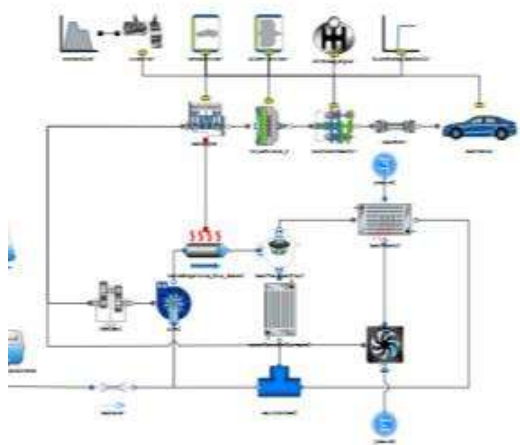
Software Interoperability



- 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.

◆ Product Design Services

System Design



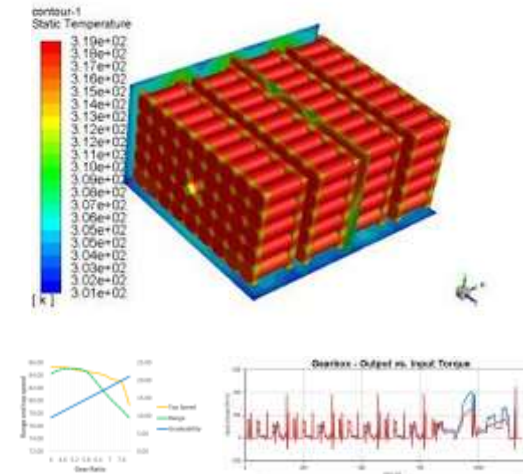
- XEV System Design
- Test System Design: after-treatment,
- Component Sizing
- Defining Boundary Conditions
- System Specification
- Component/System Architecture detailing
- Design for Certification
- D/PFMEA

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

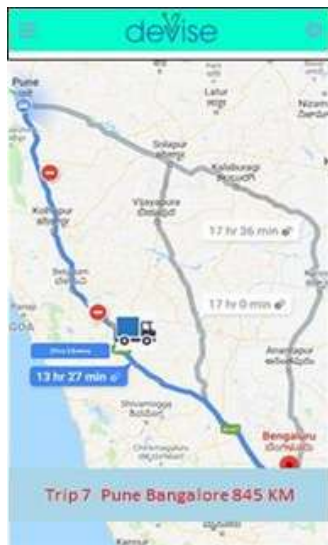
Testing & Validation



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

◆ Data Engineering & Science

Data Collection



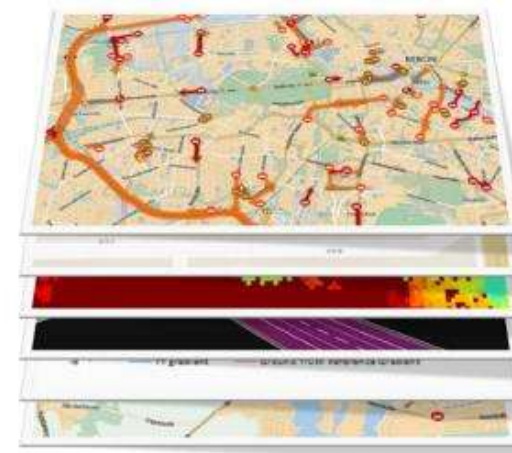
- Live Tracking
- High Speed Datalogging
- A2L Based ECU Parameters
- OBD and standardized data
- CAN Data Logging
- Audio and Video data capturing
- Fuel and Driver Behavior Monitoring
- HTTPS, MQTT and FTP
- Service Discovery Methods
- Server and Cloud Setup
- Data Security

Data Analysis



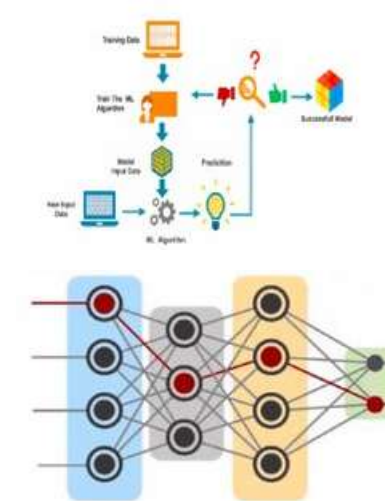
- Data Validation
- Parametric Conversions
- Gateway Handling
- Time Series Analysis
- Latency Calculation
- Feature Extraction
- Clustering and Profiling
- Sorting
- Data calibration
- Data synchronization
- Thresholds and Alerts generation
- Trends and signature analysis

Data Fusion



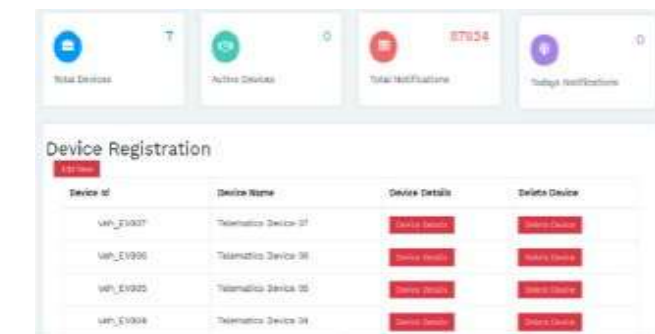
- Global Timestamping
- GNSS/IMU Fusion Systems
- Competitive Fusion
- Distributed and Centralized Architecture
- Fleet Data fusion
- AI Integration at EDGE and CLOUD
- LLM and SLM
- DTC and Fault Snapshot creation
- Pattern discovery
- Crash Analytics

Decision Making



- Prediction Algorithms
- Descriptive Analytics
- Fault Tree tracing
- Neural Nets
- Hierarchical Decision Making
- Redundancy
- Speech Recognition
- Reinforcement Learning
- Long Short-Term Memory Models
- Collision Avoidance
- Integration with Robot Operating System (ROS)

Data Dashboard



- Maps, Path and Trip history
- Dynamic Collections
- CAN data visualization
- Cloud Dashboard
- Login Authentication
- Data Visualization
- Device Management and Administration
- Device Configuration
- Usage analytics
- ROI analytics
- OTA Updates
- SUMS Integration

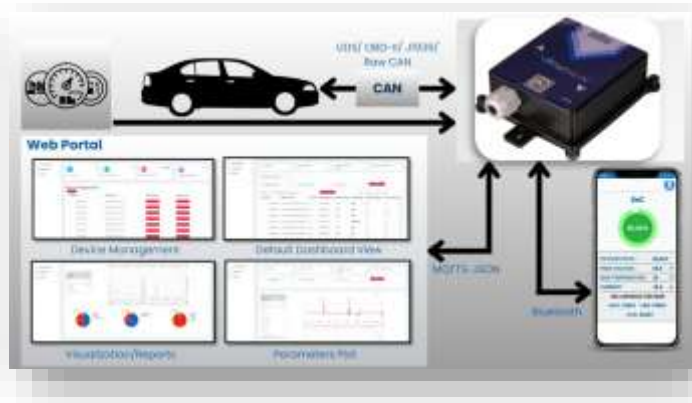
◆ Diagnostic Solutions

Service Diagnostics



- Read VIN and ECU Dataset
- Read DTC
- Clear DTC
- Live Data Monitoring
- Actuator Testing
- Routine Testing
- DPF Regeneration
- Soot Mass Reset for DPF Regeneration
- Write Data
- Flashing

Remote Diagnostics and Troubleshooting



- Remote and local troubleshooting
- Device Management
- Data Datalogging
- Packet Processing
- Data analytics and Visualization

Guided diagnostics



- No. of ECUs/ controller worked – coverage from BSIII to BSVI
- Technician Efficiency improvements
- Unique PCODES and DTCs
- Unique DTC and Symptom Trees
- Validated Troubleshooting Steps

Diagnostics Administration



- Management Dashboards
- User/Device Registration
- UDS Services Authoring
- Tree Authoring
- Digital Job card
- OTA Firmware campaign

Datalogging & Special Purpose tools



- **deDIAG** Measurement – Calibration – Diagnostics Tool
- **deEOL** (End Of Line tool)
- HV/C- High Speed Datalogger
- **deCFI** (CAN fault injector)
- Field Test vehicle Datalogger

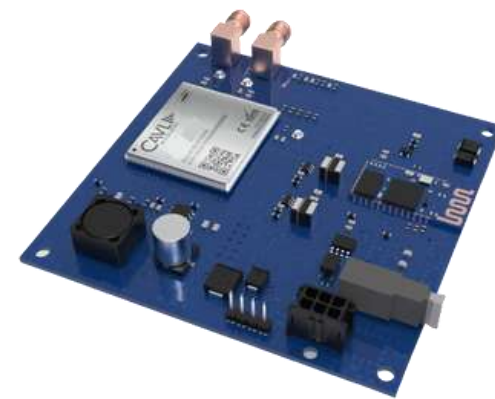
◆ Project Experience

Techno-Commercial Consulting



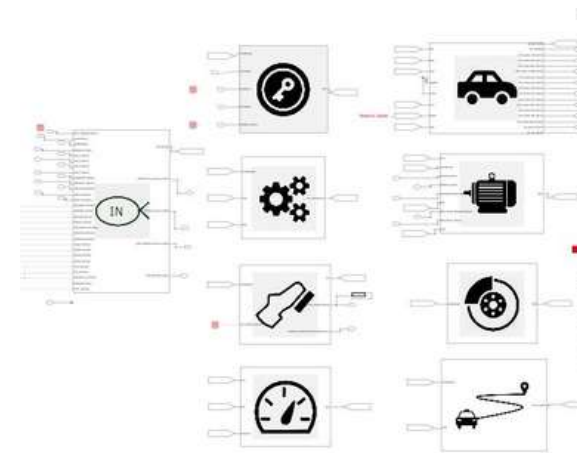
- EV Industry Entry Point Analysis for traditional Tier 1
- Supply Chain Localization for EV
- JV Setup for Local Manufacturing
- Should Cost Analysis for Motor + Inverter

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

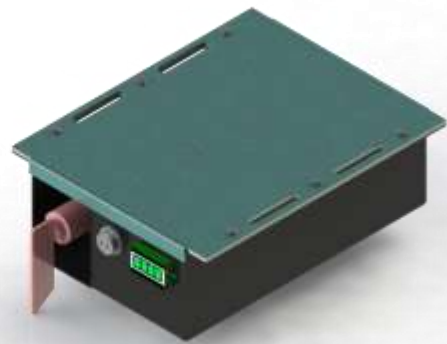
Vehicle Integration



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

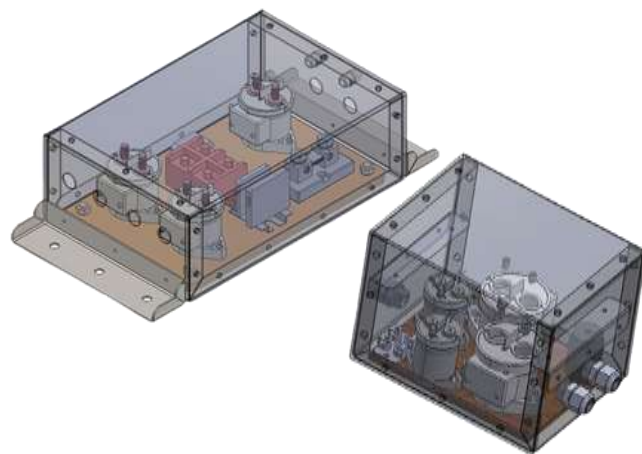
Project Experience

Re-chargeable Energy Storage System



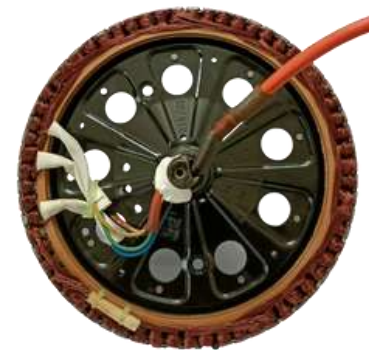
- 2W / 3W- Modular and Swappable Battery Pack
- 350 V Battery Pack for Bus Hybridization
- BMS Integration for battery pack
- Flexible Wiring Harness Integration
- Ultra Capacitor Monitoring System
- Battery Pack for ESS Applications
- Refurbishment of Battery Pack
- Repurposing of Used Li cells

HV Integration



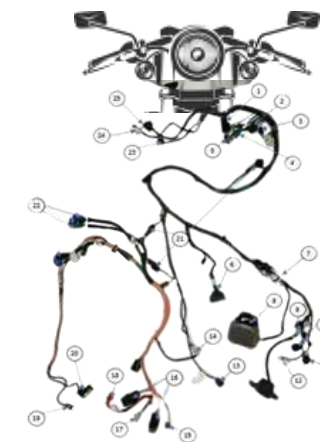
- Power Distribution Box
- 350 V Vehicle Integration for Hybrid Mini Truck
- 350 V- EV integration for Retrofittment
- HV Integration- Electric Bus
- MOSFET based Battery Disconnect Unit
- Contactor Integration
- Smart Disconnect Unit for ESS
- Accessory Power Unit for Recreational Marine Application

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



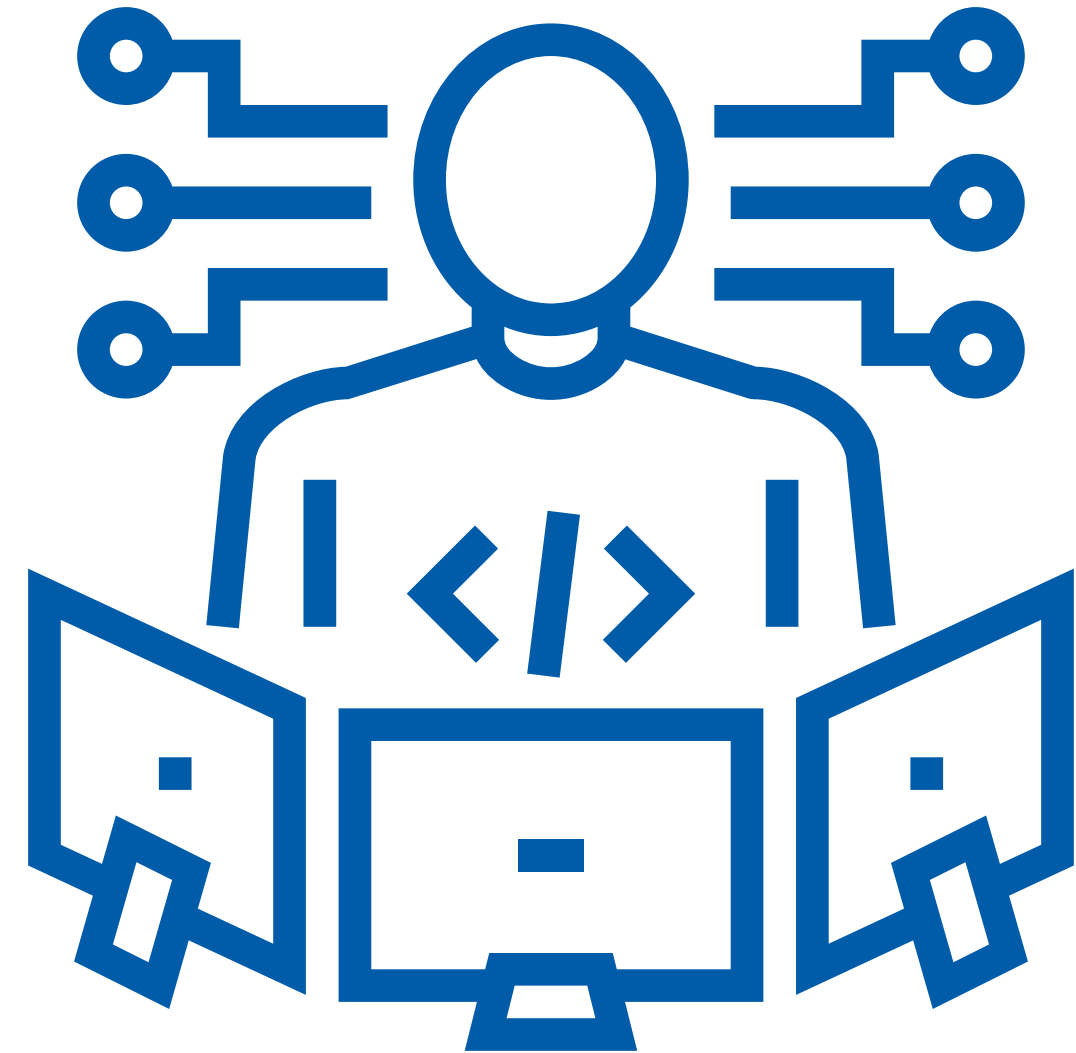
- Electrical Architecture Development for 3- Wheeler
- EMI/C Testing and Validation at Component and System level
- Electrical Architecture for AGV
- EV Retrofitment for Forklift
- Powertrain Integration in LCV
- Battery Pack for Hybrid LCV
- VCU Integration in Bus
- Vehicle Integration for series Hybrid

Vehicle Electronics

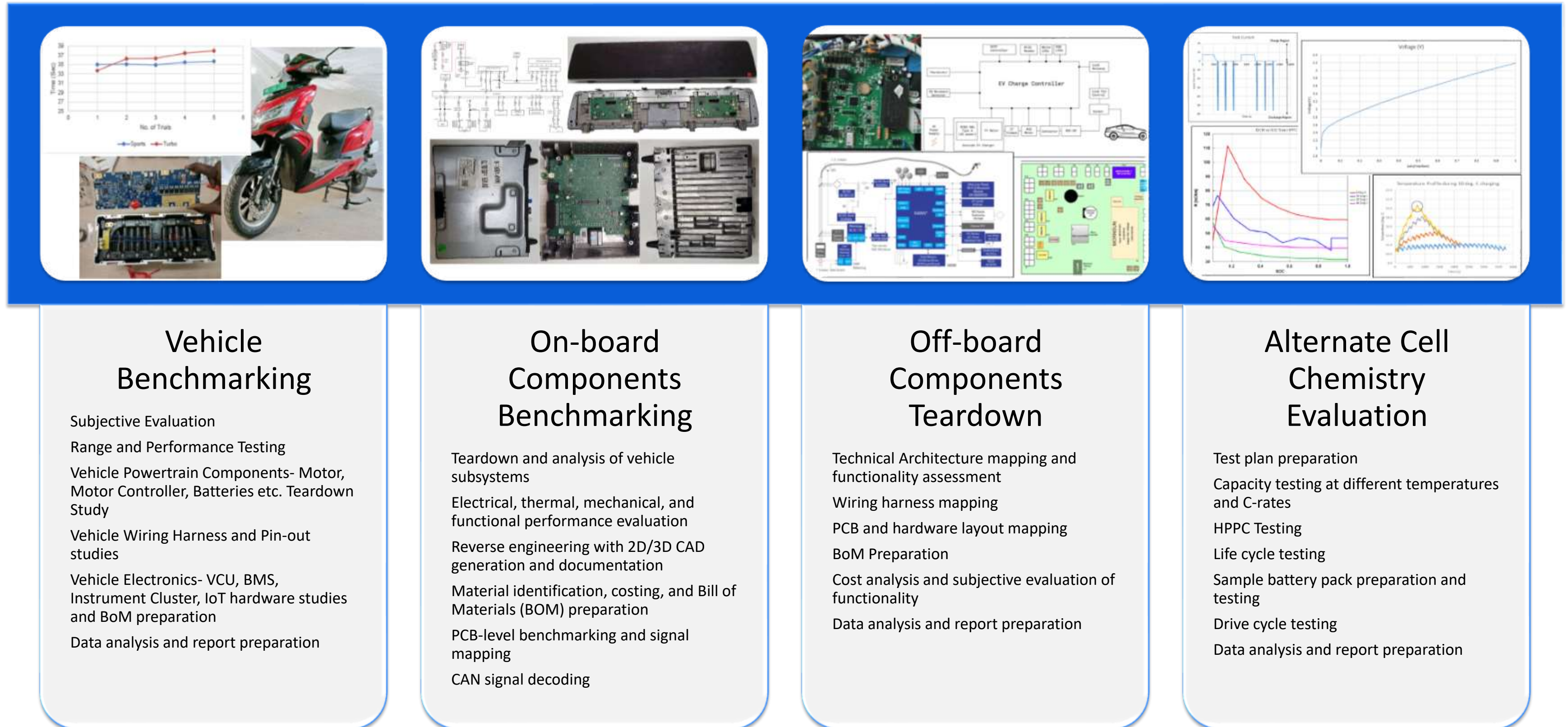


- Smart Dashboard for 2 Wheeler/3 Wheeler
- IoT Enabled Remote Control for EV
- Solar Integration for 2 Wheeler charging
- Retrofitment of existing ECUs with configurable ECUs
- Vehicle Controller for 3 Wheeler Application
- Vehicle Controller Logic for Electric Bus
- Smart Logic for Charging optimization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

◆ Technical Consultancy



◆ Benchmarking | Teardown



Technical Consultancy

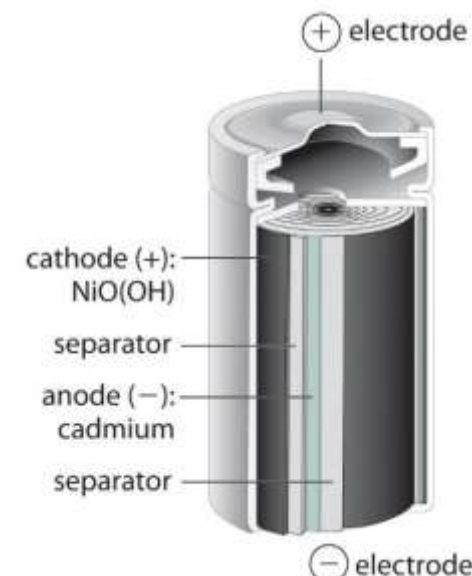


Technical Assessment / Due Diligence Projects Undertaken

DOMAIN	Details	No. of Projects Undertaken
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+

We can actively facilitate Tech Transfer such as,

- Battery Management System (BMS)
- Motor Controllers
- Vehicle control Unit (VCU)



◆ Cybersecurity Compliance

Partner: **CYMOBILITY**



PRODUCT DEVELOPMENT & TESTING

- Component level & Vehicle level TARA
- Cybersecurity Systems & SW development
- Component level & Vehicle level Penetration Testing



CONSULTING

- Templates, Checklists and Guidelines package for ISO/SAE 21434 CSMS process compliance
- Consulting services from concept design to service support
- VSOC, Incident Management



SECURITY AUDITS & ASSESSMENTS

- Cybersecurity Management System Audits according to ISO/SAE 21434 and ISO/PAS 5112
- Cybersecurity Project Assessment according to ISO/SAE 21434 clause 6.4.8
- UNR155 and UNR156
- ISO 27001 and TISAX



COMPETENCY ADVANCEMENT

- ISO/SAE 21434 Training for Automotive Managers and Engineers
- Comprehensive training focusing on Automotive Threat Analysis and Risk Assessment (TARA)
- Customized Automotive Cybersecurity trainings



TOOL DEVELOPMENT

- Tools required for cybersecurity development and management such as VSOC, Compliance management and SBOM

Software Defined Vehicles

Partner:  SONATUS

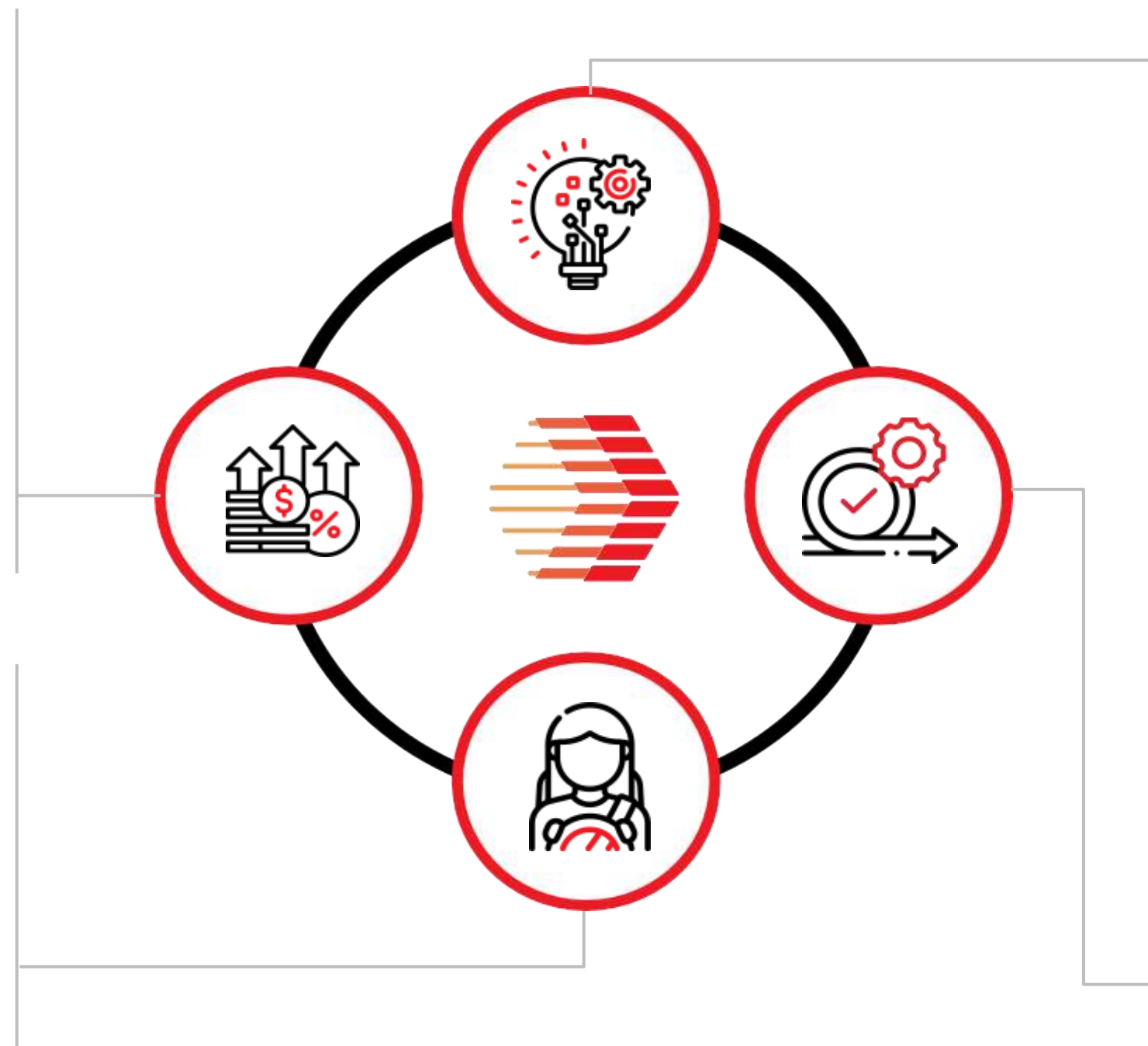
Value-added Services

Cloud-enabled integration:

- Fleet Applications
- Usage Based Insurance
- Smart Cities, Infrastructure
- Smart Home Integration

Post-sales

- Deploy new, personalized features
- Conduct extensive remote diagnostics
- Automatically calibrate ECUs remotely



Design and Engineering

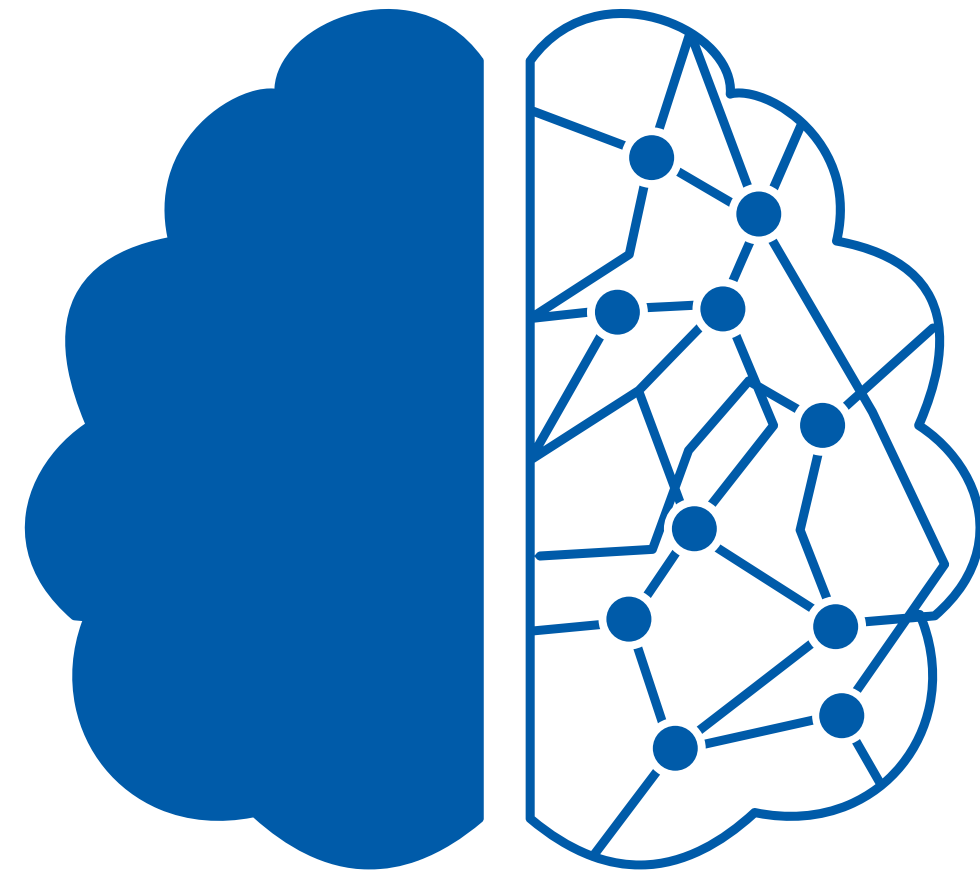
- Enable cloud-native development
- Collect data dynamically to drive innovation
- Provide faster feature prototyping
- Empower E/E architecture evolution

Production

- Remote automated end-of-line testing
- Automate tuning of ECUs



❖ Mobility Skill Development



Training Modules



Electric Vehicle Technology

Comprehensive training on EV systems, battery technology, and charging infrastructure.



Future Mobility

Connected, Shared, Functional Safety & Cybersecurity solutions for tomorrow's transportation needs.



ADAS & Autonomous Technology

Cutting-edge training on advanced driver assistance and autonomous driving systems.



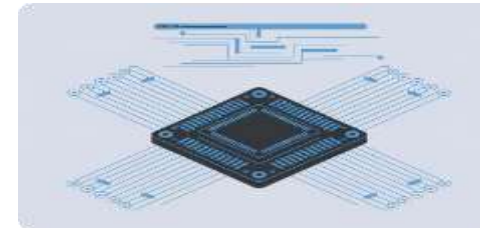
Vehicle Engineering

Comprehensive modules covering mechanical, electrical, and systems engineering for modern vehicles.



IoT & Advanced Computing

Specialized training on Internet of Things applications and advanced computing solutions.

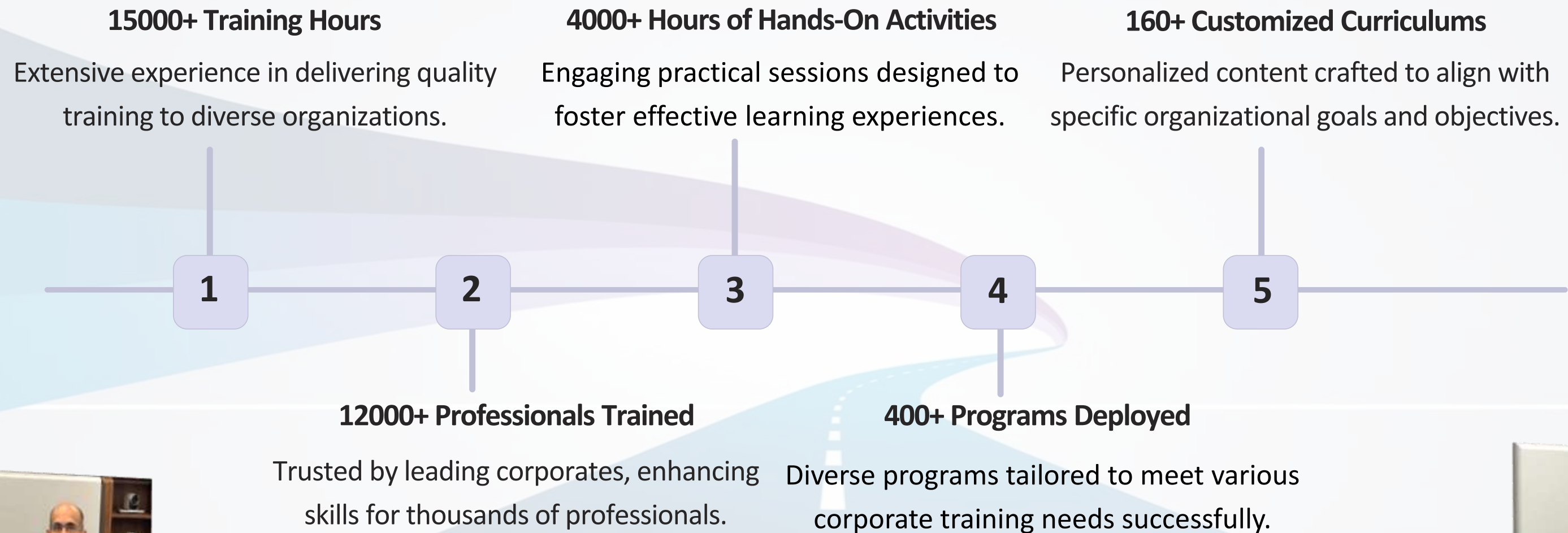


Embedded Hardware & Software

Detailed modules on embedded systems development and programming for automotive applications.



Training Journey



◆ Hands-on Learning



Training Setups



2 Wheeler Training Rig



BMS Training Rig with Load Bank



Cell Test Training Kit



4 Wheeler Training Rig



Battery Pack Training Rig



VCU Training Rig

◆ Our Presence

Training Centres

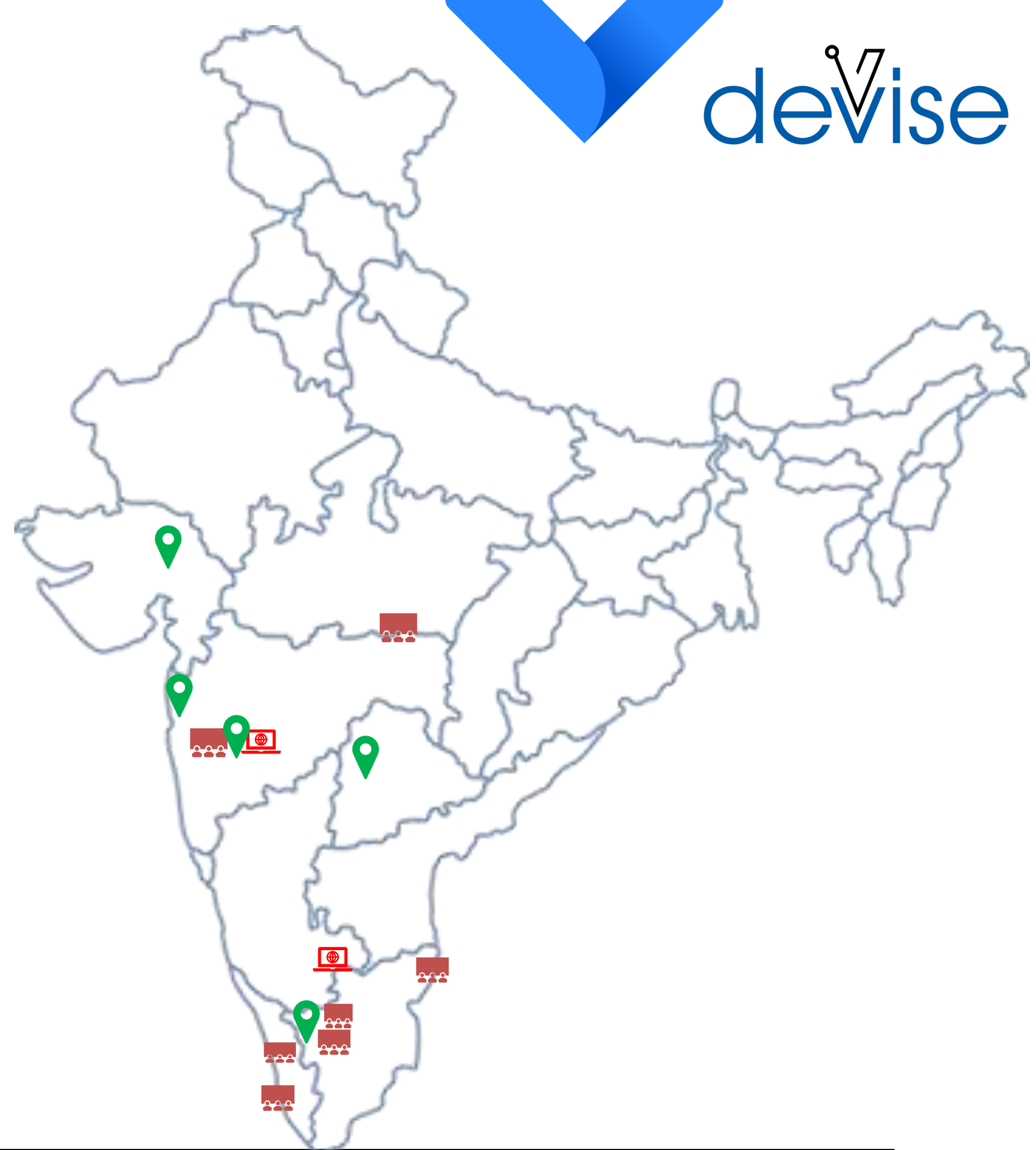
1. Haritha Mobility – Coimbatore
2. Little Flower ITI – Kochi
3. Parshuram ITI - Nagpur
4. MIT WPU – Pune
5. Si'Tarc – Coimbatore
6. CAAR – Chennai
7. IPTIF - IIT Palakkad

Cyber Centres

1. Microscan Communications - Pune
2. CyMobility - Bengaluru

Rig Deployments

1. IACE- Gandhinagar
2. TATA IIS – Mumbai
3. TATA IIS - Gandhinagar
4. MIT WPU – Pune
5. MIT AOE – Pune
6. SREC – Coimbatore
7. SRIT - Coimbatore
8. BITS Pilani – Hyderabad
9. BVRIT - Hyderabad



◆ SkillCircuit– Our Flexible LMS

devise



HOME

ABOUT US ▾

R&D SERVICES

PRODUCTS

SKILLING ▾

CAREER ▾

Training Courses:

1. EV Fundamentals
2. Battery Simulation and Modelling for Next Gen Electric Vehicles
3. Advance Motor Design
4. Advance Electric Powertrain Modelling & Control
5. Electric Vehicle Thermal Architecture
6. EV Truck Powertrain
7. Global EV Passenger Cars
8. Embedded Systems
9. Basics of CAN Protocol – Concept, Communication & Diagnostics



SKILLCIRCUIT
POWERED BY DEVISE ELECTRONICS

"Where Learning Sparks Innovation"

Explore More

SkillCircuit Pro-Lab



State-of-the-Art Equipment

Our labs are equipped with the latest technology and tools for comprehensive learning

Specialized Teaching Aids

Custom-designed educational materials to enhance understanding of complex concepts

Practical Learning Environment

Container based lab setup also possible. Designed to simulate real-world scenarios for effective skill development

◆ Clientele



OEMs/Strategy Consultancy



◆ Clientele



Tier 1 Suppliers/Universities



KALYANI





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