

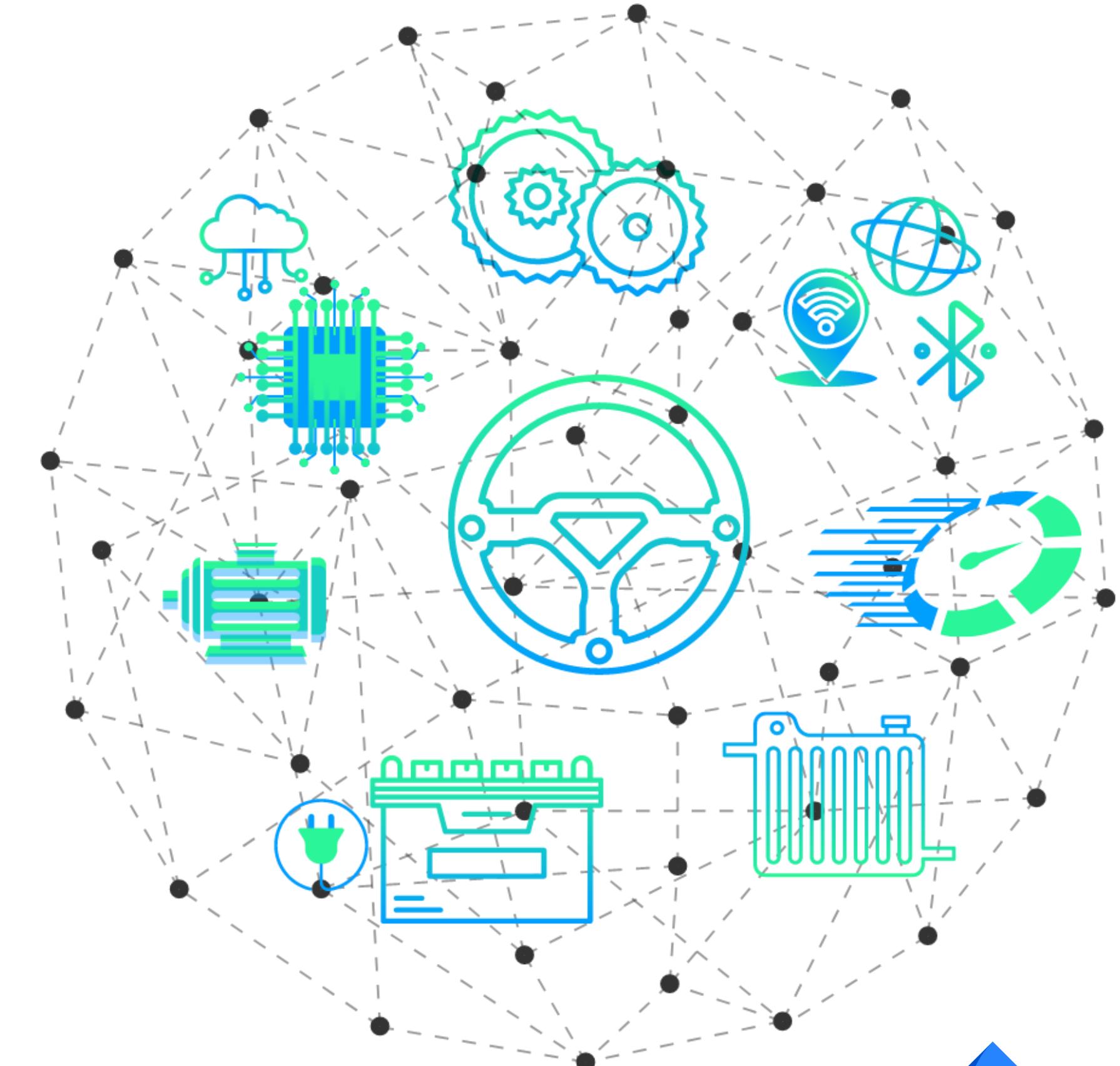
devise | 10 Years  
Of Excellence!

# Devise Electronics

Your Development Partner Since 2013



[www.deviseelectronics.com](http://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

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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



**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



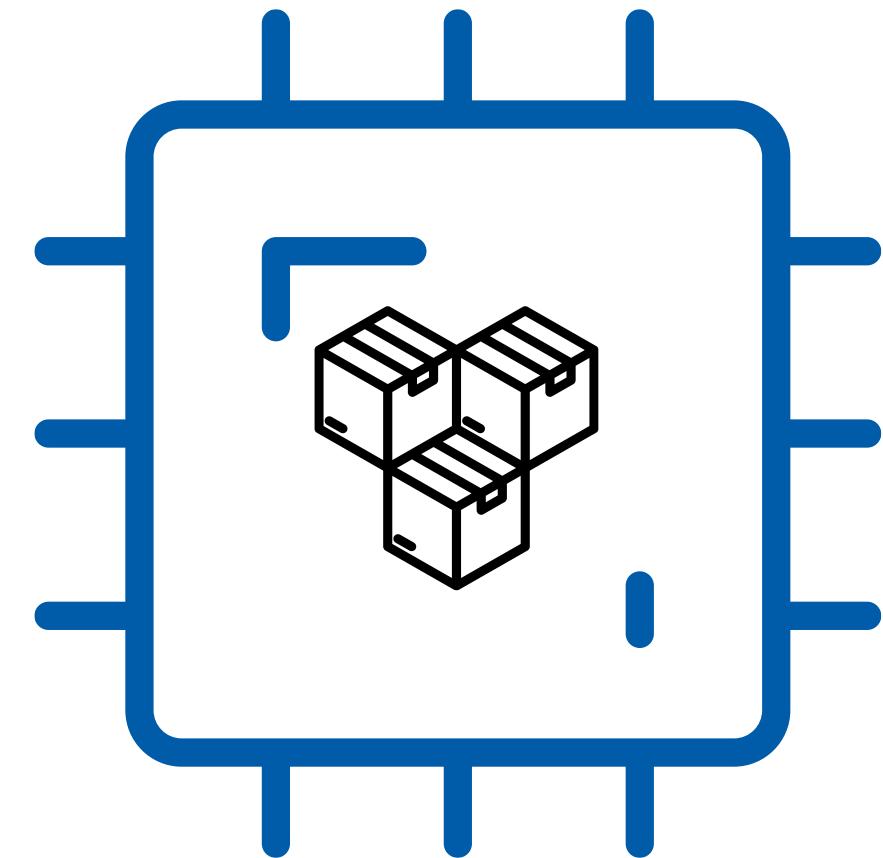
**SAGARIKA PANDE**  
Lead – Skilling  
Operations



**SUMEGH KADAM**  
Business Development Lead  
(EUROPE)



## ❖ Automotive Products



# ❖ Automotive Products

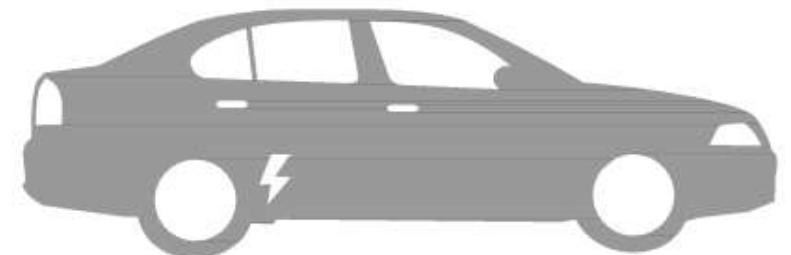
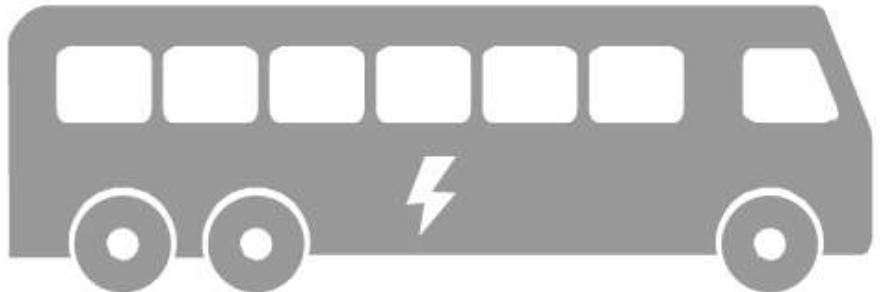
## vcu (Vehicle Control Unit)



**devCU**



**n-lite**



# Devise VCU on EV Appl.



# City Bus

Neutron 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



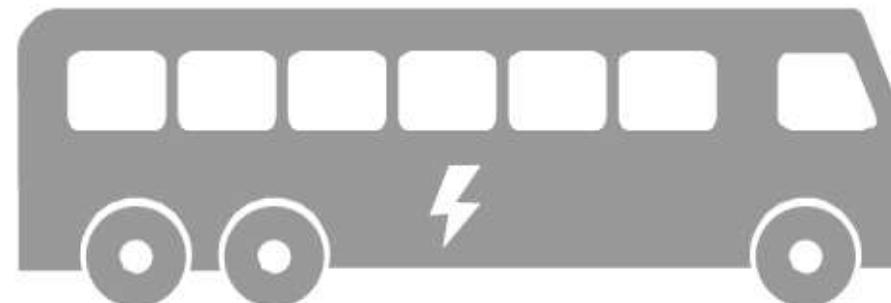
devise



**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

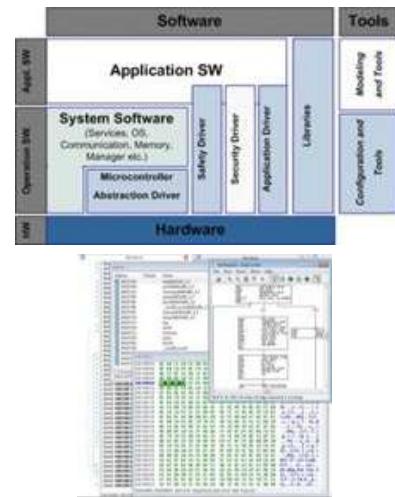
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## Embedded Hardware



- 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

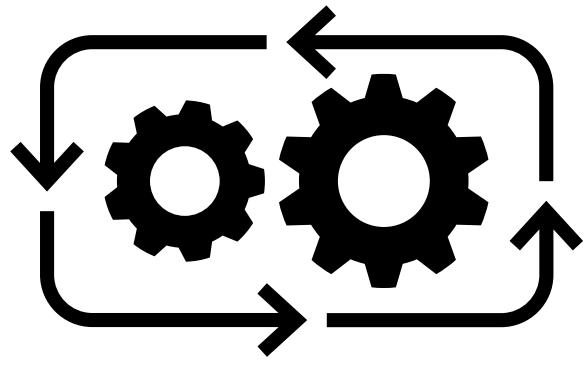


- DVP & R
- Engine Durability and Emissions Testing
- Vehicle Indoor and Outdoor Testing
- EMI/EMC Validation
- Mechanical Validation
- Environmental Validation

# Model Based Development

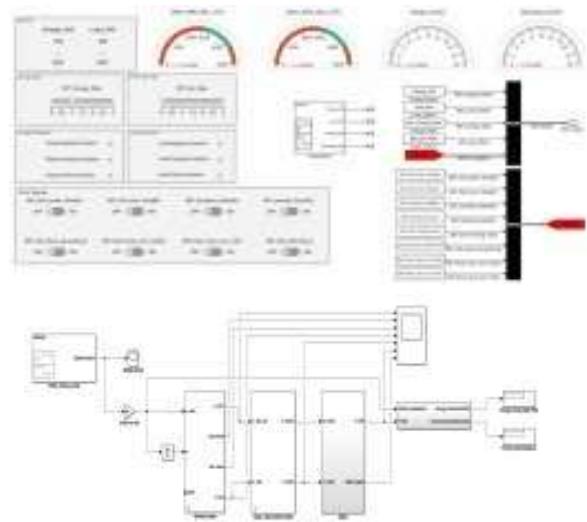
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## Workflow



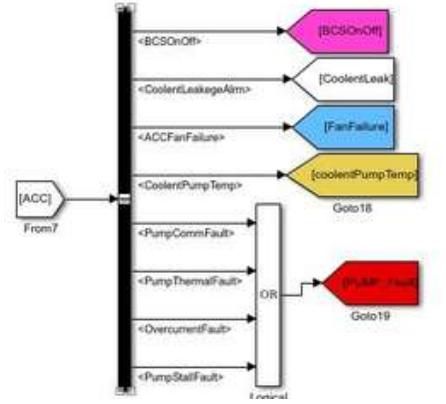
- Gather requirements and analyze the inputs. ☐
- Decide control strategy for the inputs. ☐
- Form a model with the required specifications.
- Simulate the model. ☐
- Validate data based on the relevant physical system

## Parameterization



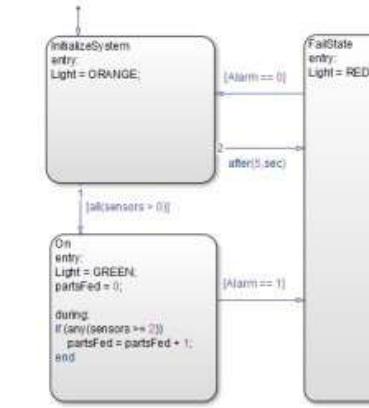
- Develop Features and Functions
- Evaluate physical system performance.
- Calculate component specification based on the performance
- Determine dependency of the component's specifications on the overall system.

## System Validation



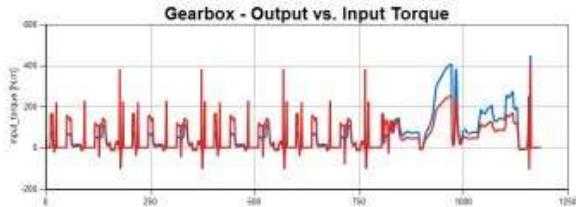
- Establish Traceability between the Model and the Code.
- Determine that the Code executes properly in its final Software and Hardware environments.
- Involve Model checks as well as SIL, PIL & HIL Testing.

## Embedded Application



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

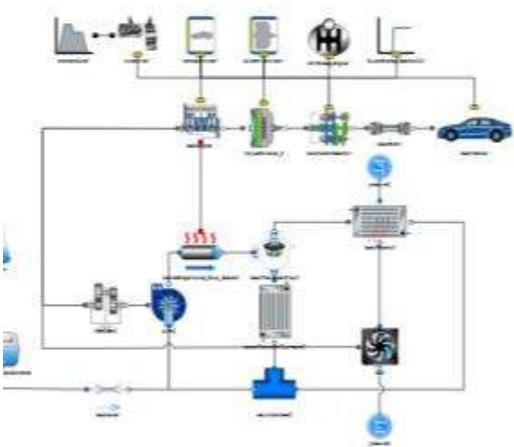
## Software Interoperability



- 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



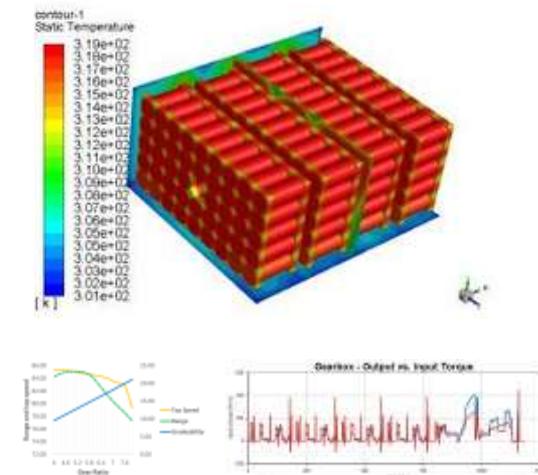
- XEV System Design
- Test System Design: after-treatment,
- Component Sizing
- Defining Boundary Conditions
- System Specification
- Component/System Architecture detailing
- Design for Certification
- D/PFMEA

## 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



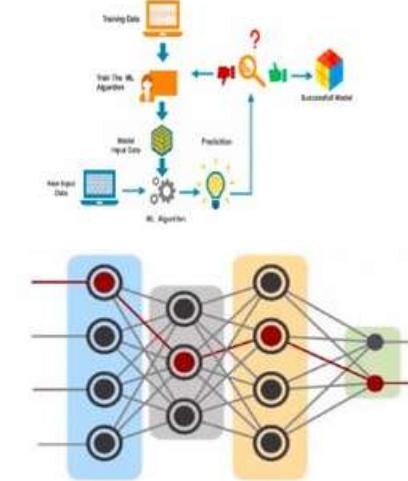
- Data Validation
- Parametric Conversions
- Gateway Handling
- Time Series Analysis
- Latency Calculation
- Feature Extraction
- Clustering and Profiling
- Sorting
- Data calibration
- Data synchronization
- Thresholds and Alerts generation
- Trends and signature analysis

## Data Fusion



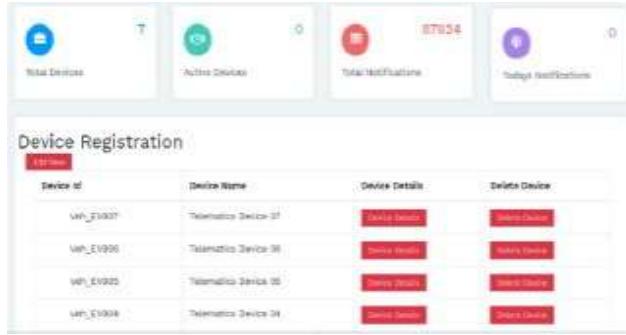
- Global Timestamping
- GNSS/IMU Fusion Systems
- Competitive Fusion
- Distributed and Centralized Architecture
- Fleet Data fusion
- AI Integration at EDGE and CLOUD
- LLM and SLM
- DTC and Fault Snapshot creation
- Pattern discovery
- Crash Analytics

## 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

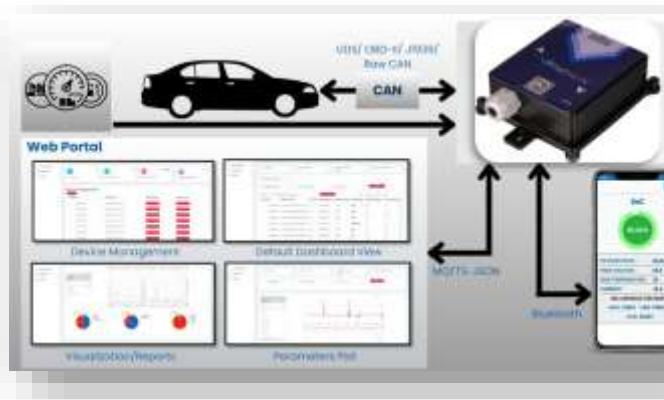


## Service Diagnostics



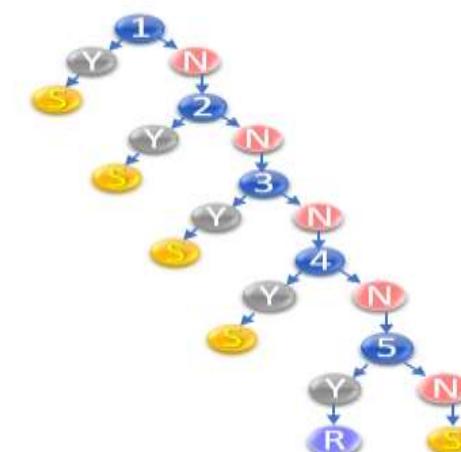
- Read VIN and ECU Dataset
- Read DTC
- Clear DTC
- Live Data Monitoring
- Actuator Testing
- Routine Testing
- DPF Regeneration
- Soot Mass Reset for DPF Regeneration
- Write Data
- Flashing

## Remote Diagnostics and Troubleshooting



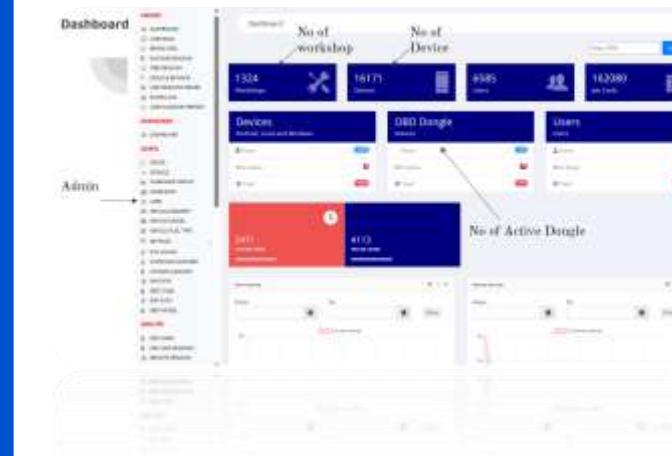
- Remote and local troubleshooting
- Device Management
- Data Datalogging
- Packet Processing
- Data analytics and Visualization

## 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

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## Techno-Commercial Consulting



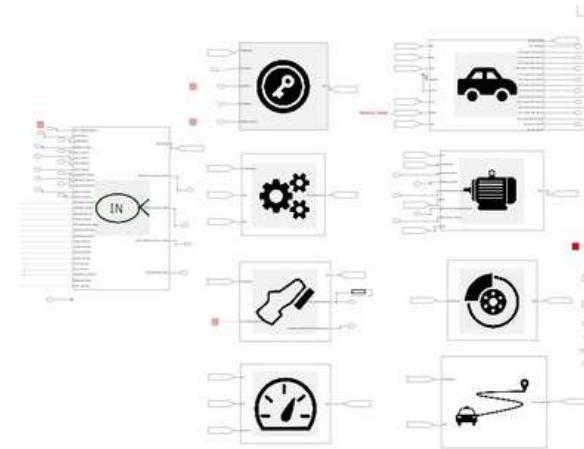
- EV Industry Entry Point Analysis for traditional Tier 1
- Supply Chain Localization for EV
- JV Setup for Local Manufacturing
- Should Cost Analysis for Motor + Inverter

## 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

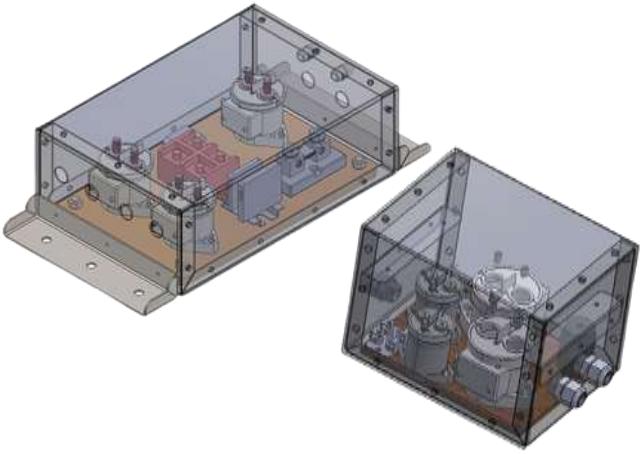
# Project Experience

## Re-chargeable Energy Storage System



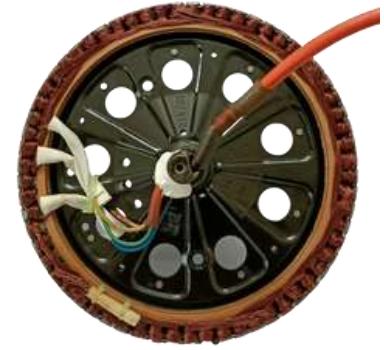
- 2W / 3W- Modular and Swappable Battery Pack
- 350 V Battery Pack for Bus Hybridization
- BMS Integration for battery pack
- Flexible Wiring Harness Integration
- Ultra Capacitor Monitoring System
- Battery Pack for ESS Applications
- Refurbishment of Battery Pack
- Repurposing of Used Li cells

## HV Integration



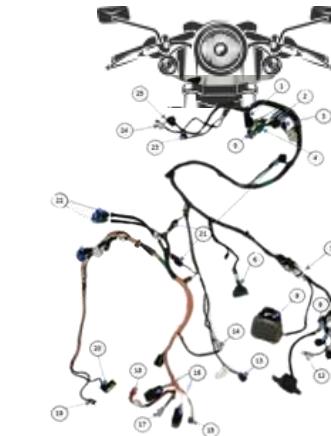
- Power Distribution Box
- 350 V Vehicle Integration for Hybrid Mini Truck
- 350 V- EV integration for Retrofitment
- HV Integration- Electric Bus
- MOSFET based Battery Disconnect Unit
- Contactor Integration
- Smart Disconnect Unit for ESS
- Accessory Power Unit for Recreational Marine Application

## 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- Vacuum

## E/E Interface



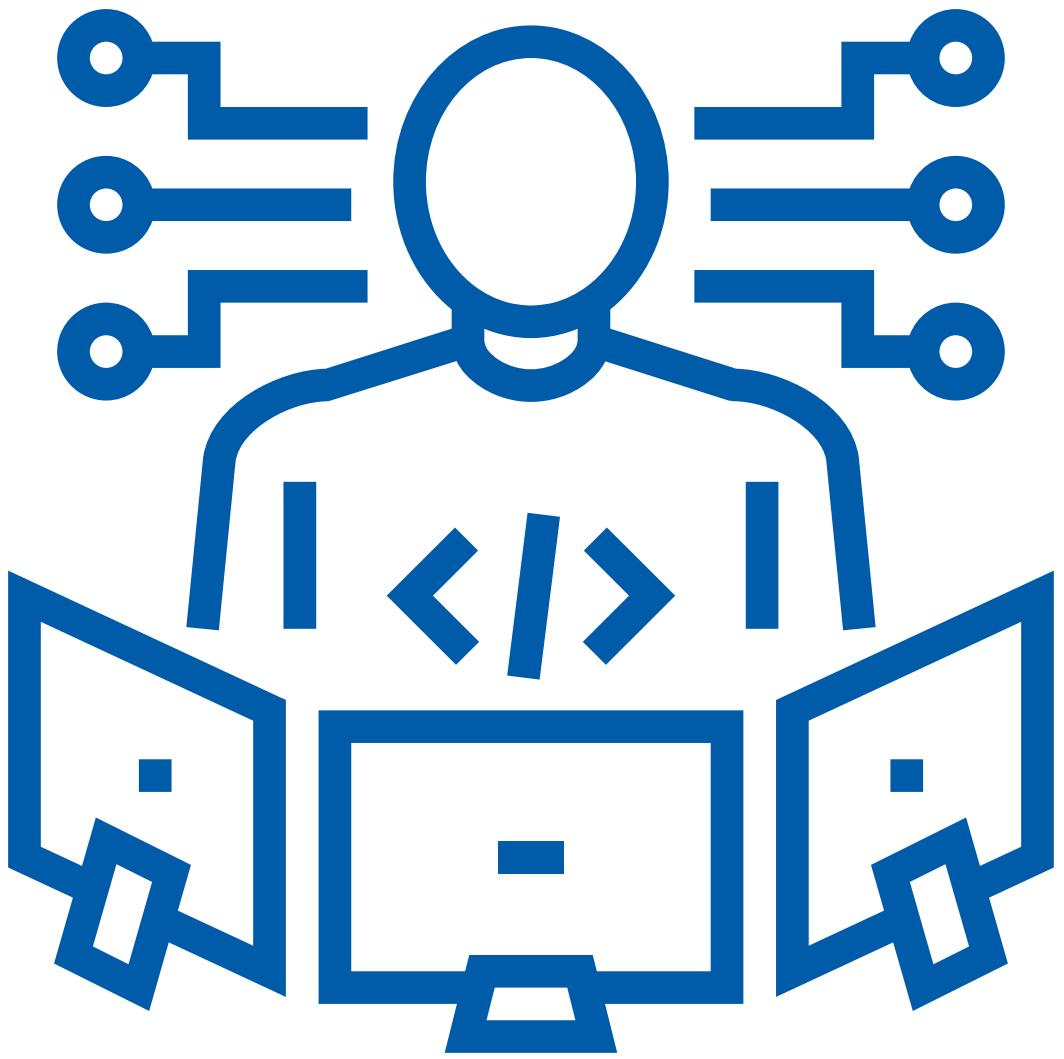
- Electrical Architecture Development for 3- Wheeler
- EMI/C Testing and Validation at Component and System level
- Electrical Architecture for AGV
- EV Retrofitment for Forklift
- Powertrain Integration in LCV
- Battery Pack for Hybrid LCV
- VCU Integration in Bus
- Vehicle Integration for series Hybrid

## 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

devise



## Vehicle Benchmarking

Subjective Evaluation  
Range and Performance Testing  
Vehicle Powertrain Components- Motor, Motor Controller, Batteries etc. Teardown Study  
Vehicle Wiring Harness and Pin-out studies  
Vehicle Electronics- VCU, BMS, Instrument Cluster, IoT hardware studies and BoM preparation  
Data analysis and report preparation

## On-board Components Benchmarking

Teardown and analysis of vehicle subsystems  
Electrical, thermal, mechanical, and functional performance evaluation  
Reverse engineering with 2D/3D CAD generation and documentation  
Material identification, costing, and Bill of Materials (BOM) preparation  
PCB-level benchmarking and signal mapping  
CAN signal decoding

## Off-board Components Teardown

Technical Architecture mapping and functionality assessment  
Wiring harness mapping  
PCB and hardware layout mapping  
BoM Preparation  
Cost analysis and subjective evaluation of functionality  
Data analysis and report preparation

## Alternate Cell Chemistry Evaluation

Test plan preparation  
Capacity testing at different temperatures and C-rates  
HPPC Testing  
Life cycle testing  
Sample battery pack preparation and testing  
Drive cycle testing  
Data analysis and report preparation

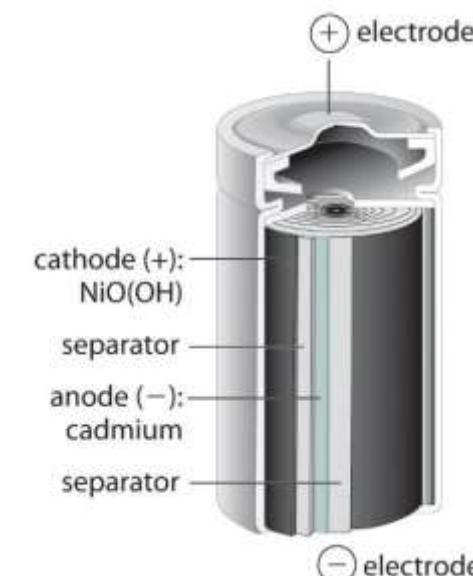
# ❖ Technical Consultancy

## 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



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# Software Defined Vehicles

Partner:  SONATUS

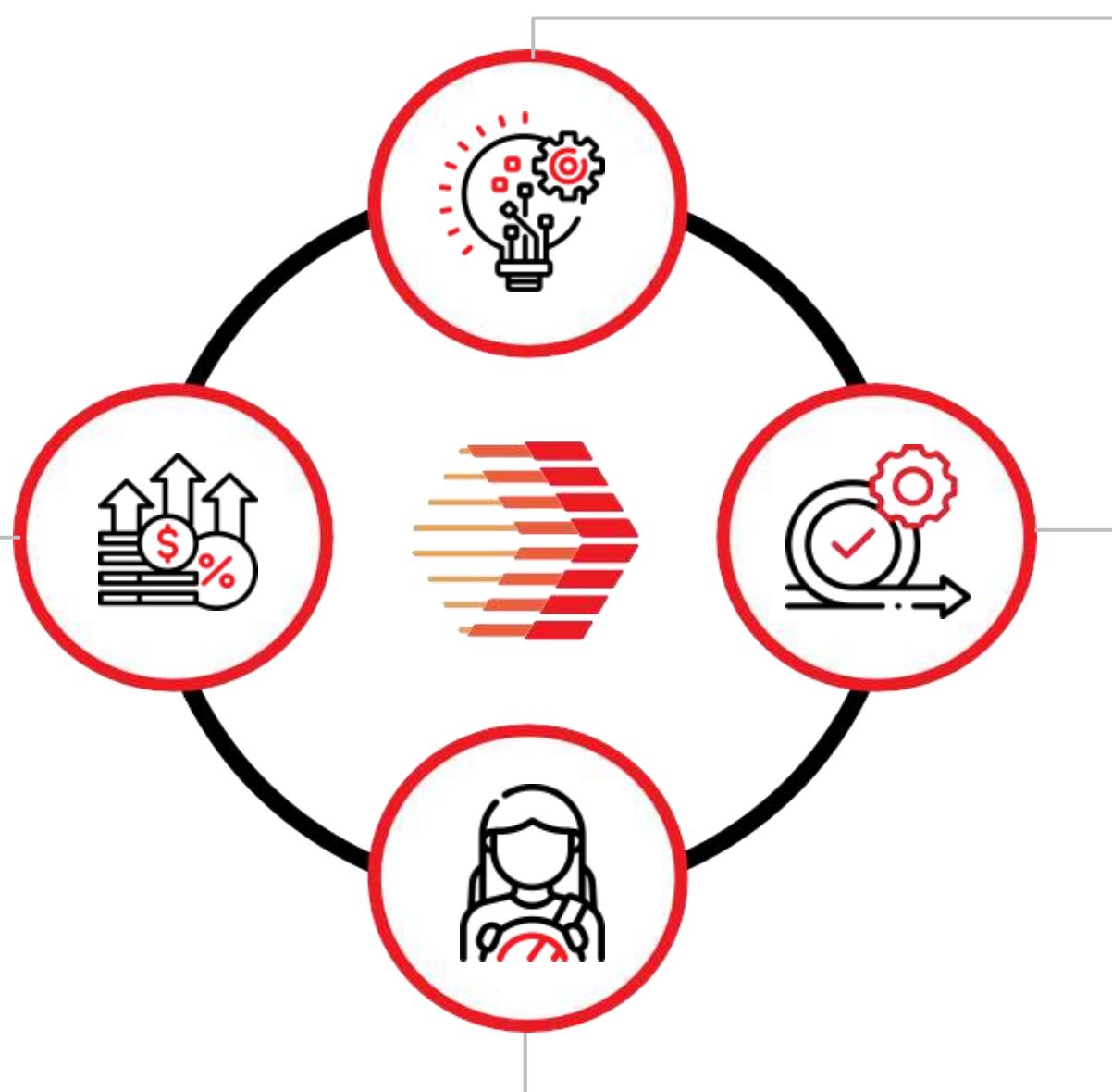
## Value-added Services

### 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

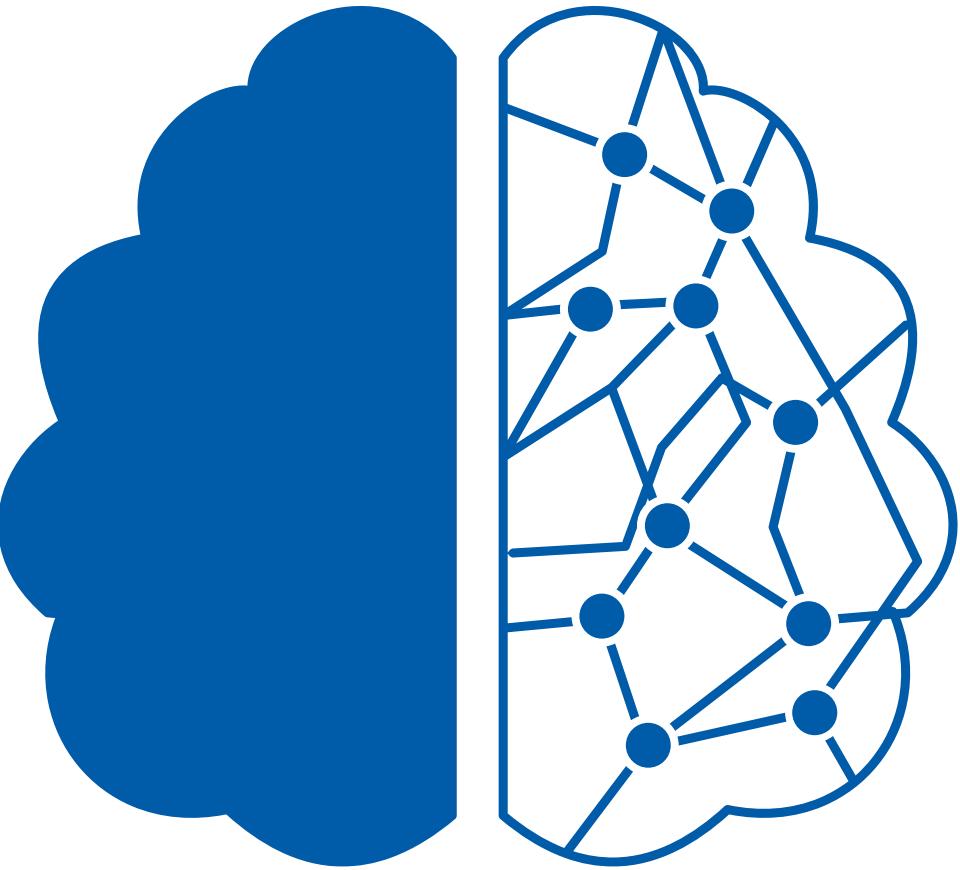
- Enable cloud-native development
- Collect data dynamically to drive innovation
- Provide faster feature prototyping
- Empower E/E architecture evolution

## 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.



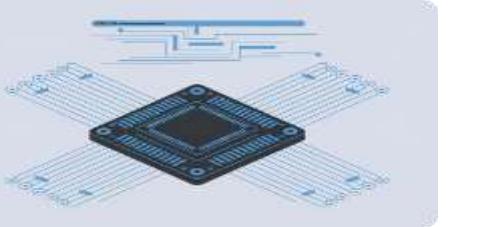
## Vehicle Engineering

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



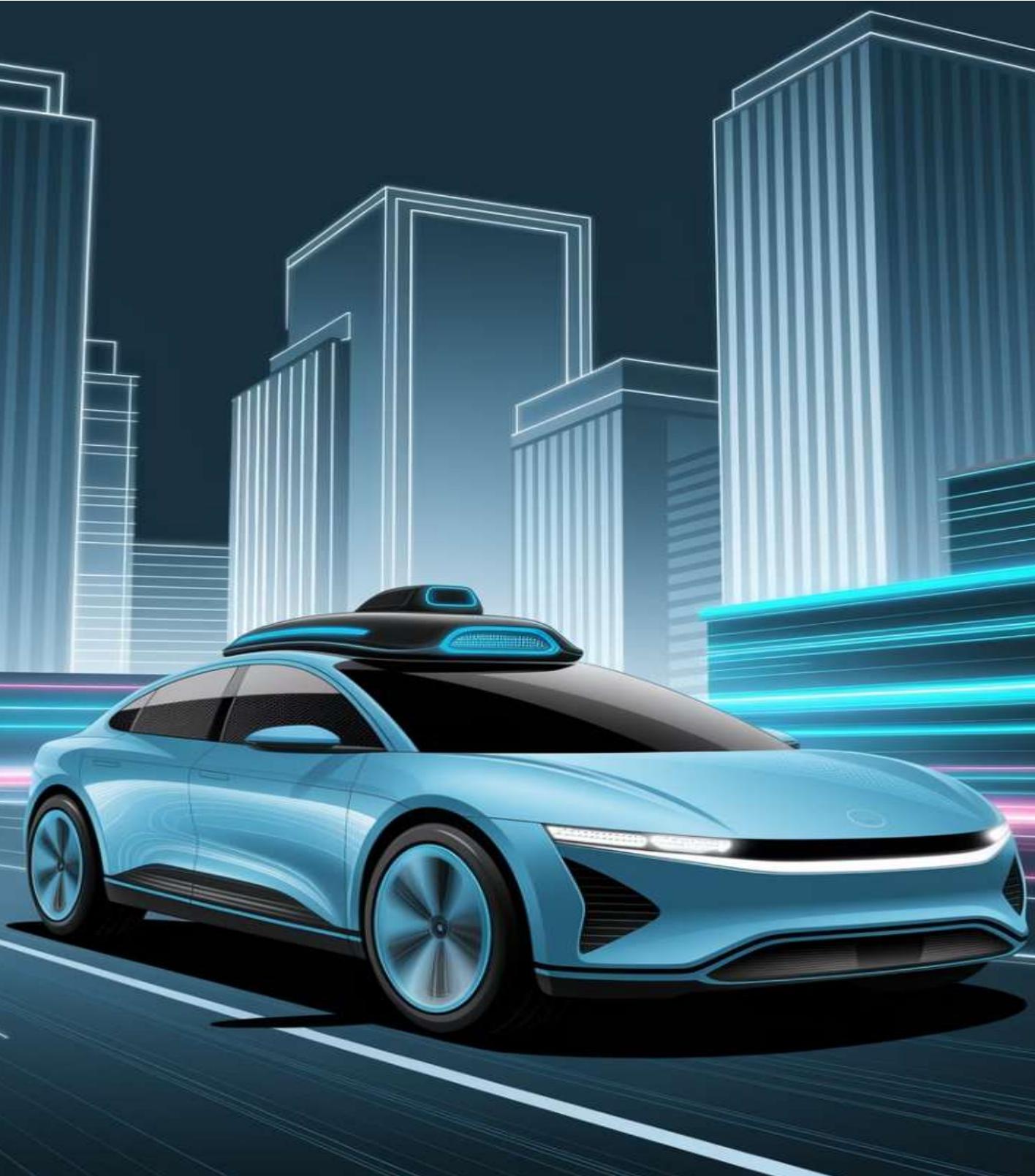
## IoT & Advanced Computing

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



## 15000+ Training Hours

Extensive experience in delivering quality training to diverse organizations.

## 4000+ Hours of Hands-On Activities

Engaging practical sessions designed to foster effective learning experiences.

## 160+ Customized Curriculums

Personalized content crafted to align with specific organizational goals and objectives.

1

2

3

4

5

## 12000+ Professionals Trained

Trusted by leading corporates, enhancing skills for thousands of professionals.



## 400+ Programs Deployed

Diverse programs tailored to meet various corporate training needs successfully.



# ❖ 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

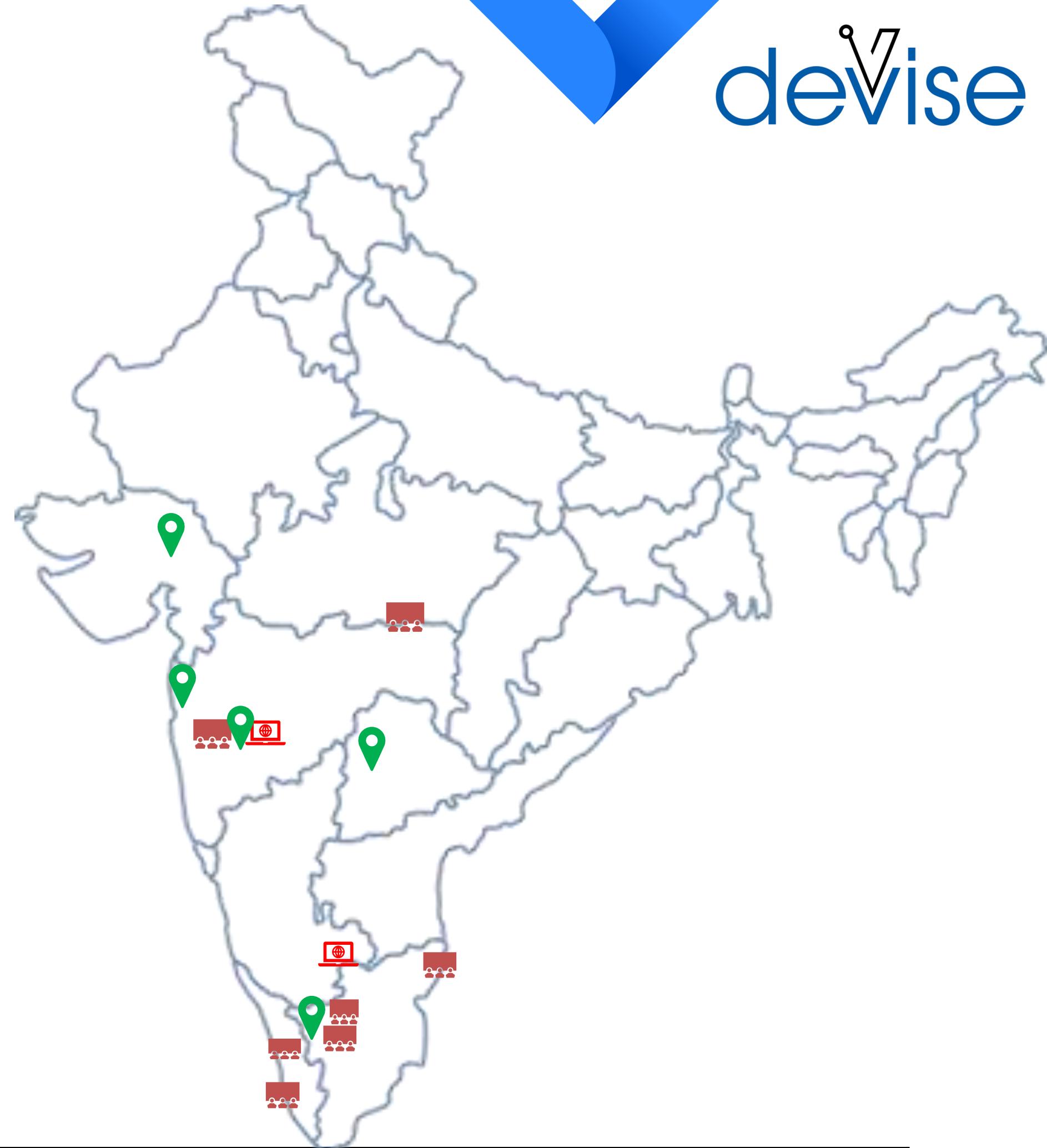
1. Haritha Mobility – Coimbatore
2. Little Flower ITI – Kochi
3. Parshuram ITI - Nagpur
4. MIT WPU – Pune
5. Si'Tarc – Coimbatore
6. CAAR – Chennai
7. IPTIF - IIT Palakkad

## 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

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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

devise



Steel Strips Wheels Limited



# Clientele

## Tier 1 Suppliers/Universities

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# Devise Electronics Pvt. Ltd.

**Address:** 1st floor, Plot No. 4, Survey No. 5,  
Bavdhan Khurd, near Carwala garage,  
DSK Ranwara road, Pune – 411021,  
Maharashtra, INDIA.

**Phone No:** +91 7030401122

**Email:** [enquiry@deviseelectronics.com](mailto:enquiry@deviseelectronics.com)

**Web:** [www.deviseelectronics.com](http://www.deviseelectronics.com)

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