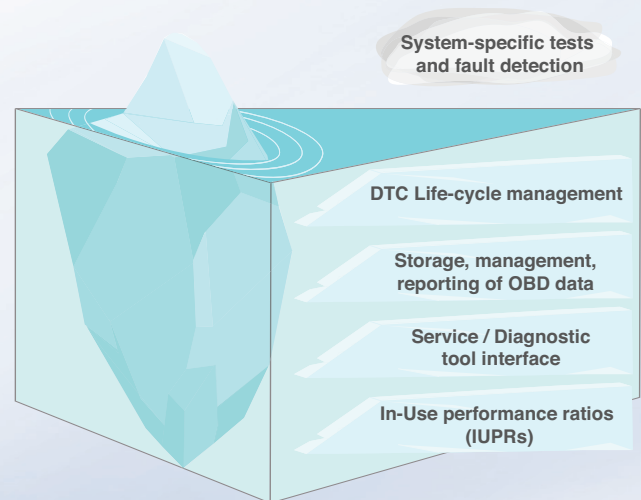The OBD Infrastructure software product guides ECU developers through the complex process of implementing on-board diagnostics (OBD), particularly where compliance with CARB, EPA and European emissions legislation is required.

Systems engineers can focus on their area of expertise by defining specific tests and fault detection criteria.   The OBD Infrastructure software then reduces the complexities of managing fault handling. This task requires specialist knowledge and typically takes over 10 man years of effort to start from analysing legislated specifications and finish with a compliant software implementation.

The product significantly reduces the effort to add OBD to a typical project by successfully capturing Pi Innovo engineering expertise gained over years of OBD implementations in vehicle applications including powertrain and exhaust gas aftertreatment.

System-specific tests and fault detection

DTC Life-cycle management

Storage, management, reporting of OBD data

Service / Diagnostic tool interface

In-Use performance ratios (IUPRs)

OBD Challenge

On-board diagnostic capabilities improve efficiency in the detection and repair of increasingly complex vehicle systems. Exhaust emissions legislation adds complex mandatory OBD capabilities to ensure that vehicle emissions related systems continue to function as designed.

Allowed emissions are continuously being reduced and the scope of applicable vehicles is being increased. Within the decade legislation will extend to include hybrid, alternative fuel, off-highway, motorcycles and marine.

OBD Standards

The OBD Infrastructure product has the flexibility to support all major proprietary and legislative OBD requirements. Pi Innovo experts monitor the leading regulatory bodies:

- California Air Resources Board
- US Environmental Protection Agency
- European Union

and communication standards:

- Light duty vehicles (ISO 15765)
- Heavy duty (SAE J1939)

on which global standards are based.

Scan Tool

OBD Implementation Iceberg

The OBD Infrastructure product guides the developer through the OBD implementation iceberg by providing two key elements:
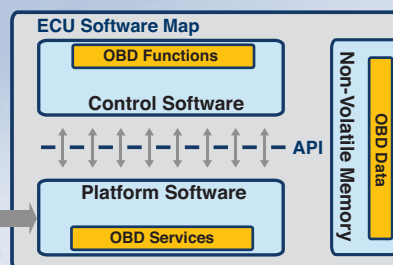
- Libraries of configurable software
- Intelligent software build system

Libraries of Configurable Software

Once a fault condition has been detected, OBD legislation precisely defines how the fault and associated information should be stored and reported using defined constructs including:

- Diagnostic Trouble Codes (DTC)
- Freeze-frames
- Diagnostic Monitor Entities (DME)
- Diagnostic Test Entities (DTE)
- In-Use Performance Ratios (IUPR)

For each construct, configurable Simulink® blocks, or C functions, guide their correct addition to the control system. Interactive dialogues then prompt for correct compliance selection and data.

ECU Software Map

OBD Functions

Control Software

API

Platform Software

OBD Services

Non-Volatile Memory

OBD Data

Intelligent Software Build System

The developer can add OBD functionality to each system test independently and rely on the Intelligent build system to take on the highly complex task of optimising the entire system for:

- Control vs platform software partition
- ECU performance
- Software code size
- Non-volatile memory usage

Comprehensive Support Package(s)

- Access to Pi Innovo expert support
- Optional product and application training packages
- Pi Team services can be engaged for all or any aspect of a project.

Product Options & Required Tools

Using OpenECU and Simulink®:

- OpenECU Developer Platform SIM32
- The MathWorks toolchain
- Wind River Diab C compiler

Using OpenECU and C code directly:

- OpenECU Developer Platform C-API 32
- Wind River Diab C compiler

Using alternate ECU or toolchain:

- Contact Pi Team services for quote to port product.

open ecu™

field ready technology

open ecu™

field ready technology

About OpenECU

OpenECU is a wide range of adaptable, field-ready products and intellectual property designed to accelerate electronics system development. The philosophy behind OpenECU is the creation of modular, reusable technology that is implemented to volume production standards and is fully "open" to custom configuration, adaption and further development.

### Modules

Field ready electronics modules & accessories
A family of intelligent electronic control units (ECU) and electronic drive units housed in rugged enclosures that meet various automotive and defense production standards.

Control Strategies

Model-based control strategies
A range of proven ECU control strategies developed as MATLAB®/Simulink® models that can be licensed for implementation on any software platform.
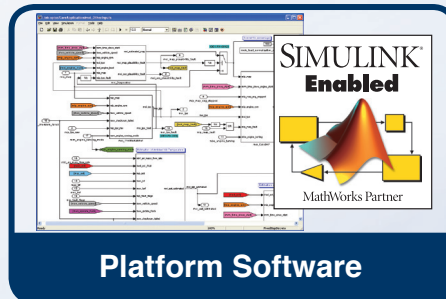
Platform Software

Portable ECU platform software
A range of ECU software platforms that enable application software to be independently written at a high level, and then targeted at any OpenECU hardware as standard or ported to custom hardware.
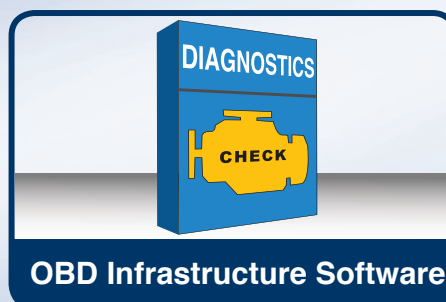
OBD Infrastructure Software

OBD Infrastructure software
A software suite designed to accelerate development of production quality system software. Easily configured for a wide range of proprietary requirements, and to comply with mandatory on-board diagnostics defined by regulatory bodies including CARB, EPA and European directives.

Contact Details

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OBDFB

Pi Innovo

vehicle electronics innovators