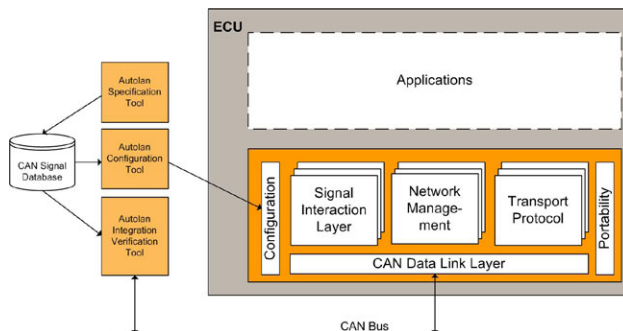


AUTOSOFT – AUTOLAN SDK

CAN Communication Software Development Kit

AUTOLAN SDK OVERVIEW



CAN communication has existed in the automotive and commercial vehicle world since 1985. Mecel has been involved in both specification and software development work since the start. The experience received over the years has been captured and formalised into the Autosoft - Autolan SDK.

The Autosoft - Autolan SDK gives the application developer a set of components that provides the basic communication mechanisms needed when ECU connects to one or more CAN-systems. By providing tools for configuration, adaptation and verification, the customer has full support through the different development stages. ■■■

EXAMPLES OF AUTOLAN USAGE

ECU single-bus solution

ECU node connected to one CAN-bus. All Autolan components are used and only application code is added.

CAN-CAN Gateway

ECU node is connected to two CAN-buses. Two instances of Autolan are used in the node, supporting a CAN-to-CAN gateway application function.

Autolan + OEM Network Management

An OEM defined Network management component is integrated into the Autolan framework.

Autolan + 3rd party components

One or more 3rd party component, e.g. CAN driver, is replacing corresponding component in Autolan.

CAN-Bluetooth Gateway

One instance of Autolan and one instance of Mecel Bluetooth SDK is forming a CAN-to-Bluetooth gateway function.

FEATURES

- Components are configurable self-contained units and exchangeable to simplify integration with customer code-base/ requirements
- Multi-instance support of components
- Software CAN filtering support
- Support for automatic code generation
- Adhere to MISRA/C rules and recommendations
- Robust
- Resource efficient
- Flexible, easy to adapt to HW/SW platforms

AUTOLAN INTEGRATION WORKFLOW

The following steps are performed once for a platform:

I Implement changes in portability module.

Adapt definitions and structures to chosen compiler and CPU.

II Component Integration Configuration.

The components of Autolan are integrated and the components service function shall be called (scheduled) within the stipulated service time.

III Verify Autolan Integration.

Link Autolan Test Integration code for target.

The Autolan Integration Verification Tool is then used to verify correctness of the integration and all pre-requisites are performed to complete the CAN communication platform.

AUTOLAN CAN SIGNAL CONFIGURATION WORKFLOW

The following steps are typically performed every time the CAN Signal Database is changed:

I Define Signal and corresponding CAN frame properties.

This can either be done using customers tools or Autolan Specification Tool.

II Generate CAN Database.

From the specification tool a CAN Signal Database is generated (standardised XML format).

III Configure Autolan.

Configured code is generated from the CAN Signal Database using the Autolan Configuration Tool.

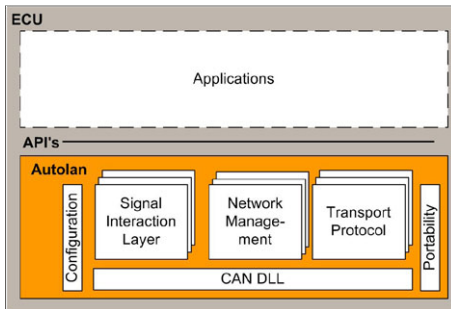
IV Implement application code.

Use the configured code in the application.



TECHNICAL SPECIFICATION AUTOLAN SDK

The target ECU for Autolan is a typical 8/16/32 bits micro-controller with internal and/or external CAN-controllers.



CAN Data Link layer

This component serve two purpose where the first is to provide optimal code for the specific CAN controller used in the ECU. The second is to provide a standardized interface for the common services needed for other software components. This includes:

- Initialization of CAN controller
- Reception of CAN messages
- Provide Message Filtering
- Transmission of CAN messages
- Wake-up functionality
- Error handling

Our Data Link Layer component has been integrated for several CAN-controllers and C-compiler combinations. We are continuously updating our list of supported CAN-controllers and c-compilers. To get the latest list of implementations, send us a request via autosoft@mecel.se. New CAN-controllers and/or c-compiler combinations can also be supported via our engineering services provided.

Network/Transport protocol

The Transport Protocol component provides the ability to send and receive segmented messages according to the ISO 15765-2 specification. Typical usage of this is diagnostic communication services or other protocols where message length exceeds the CAN data frame size, i.e. 8 bytes. Autolan support multi-channel transport service.

Signal interaction layer

The Signal Interaction Layer is the abstraction layer between application and low-level CAN communication services. By this the application software will typically use engineering units e.g. Engine Speed instead of managing CAN frames.

The Signal Interaction Layer in Autolan handles the mapping of signals into CAN frames as well as the distribution of the CAN frames. The definition of the signals and corresponding CAN frames are stored in a signal database and code is configured using Autolan Configuration Tool.

Network management

Autolan Network Management is using the master-slave paradigm and ensures a controlled start-up and shutdown of the CAN Network communication. This includes bus wake-up, supervision of the ECU's communication and controls CAN re-initializations in case a bus communication failure is detected.

TOOL SUPPORT

Autolan software components are supported with a Mecel Autolan Tool-chain from specification and configuration, to integration and verification in the target system. Mecel Autolan software and tools are using standard interchange formats e.g. XML based. Mecel Autolan tools can also generate commonly used output formats such as CANdb (*.dbc).

PRODUCT DELIVERABLES

- Autolan Software
- Autolan User manual
- Autolan Configuration Tool
- Autolan Integration Verification Tool
- Sample programs

Optional Deliverables

- Autolan Specification Tool
- Gateway Applications (CAN-CAN, CAN-BT)
- SNAP - Serial Number Arbitration Protocol
- GMLAN Communication Protocol
- J1939 Protocol Layers
- CCP - CAN Calibration Protocol

About Mecel

Mecel is a systems and software development company with more than 25 years of experience in developing solutions for the automotive industry. We specialize in in-car communication technologies, user interface development and consumer device interaction. As engineering consultants, we are pioneering state-of-the-art technology to produce innovative and efficient solutions that provide our clients with a definite competitive edge. We are skilled in taking on the entire procedure from initial R&D work to development and testing of the final products. ■■■

CONTACT US

Mecel AB

Box 14044
SE-400 20 Göteborg, Sweden

Visiting address

MöIndalsvägen 36, Göteborg

Phone +46 31 720 44 00

www.mecel.se

