VECTOR >

CANape – Tailored to Your Application

Open Interfaces for Implementing Customized Functions

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1   Introduction

CANape is a universal tool for measuring, calibrating, flashing, evaluating measurement data, etc. You edit parameter set files efficiently and traceably with the integrated but also separately available vCDMstudio. Both tools have comprehensive and powerful functions for all typical applications for optimal calibration of your ECUs. Nevertheless, there can be special cases in which the scope of functions does not match your needs exactly. By means of open interfaces, CANape and vCDMstudio can be tailored to your purposes.

A few possible expansions are listed here as examples:

> Integration of hardware measurement systems such as analog measurement technology

> Integration of cameras for detecting driving situations or temperatures (heat patterns)

> Communication using proprietary protocols

> Development of vCDMstudio plug-ins for optimization of parameters

We are happy to provide you with the necessary development services for this. Alternatively, in many cases you also have the option to perform the implementation yourself.

2   Integration of Any Measurement System with the DAIO Interface

Besides the open standard options, such as XCP, CAN, or other common automotive protocols, a universal I/O interface is also available. With the DAIO interface (Digital Analog IO), you can integrate any measurement system in CANape. The integration includes both the configuration and the actual measurement data transmission.

Configuration: The device is directly identified and selected, and the specific configuration tool is called via the "Device interface" in CANape.
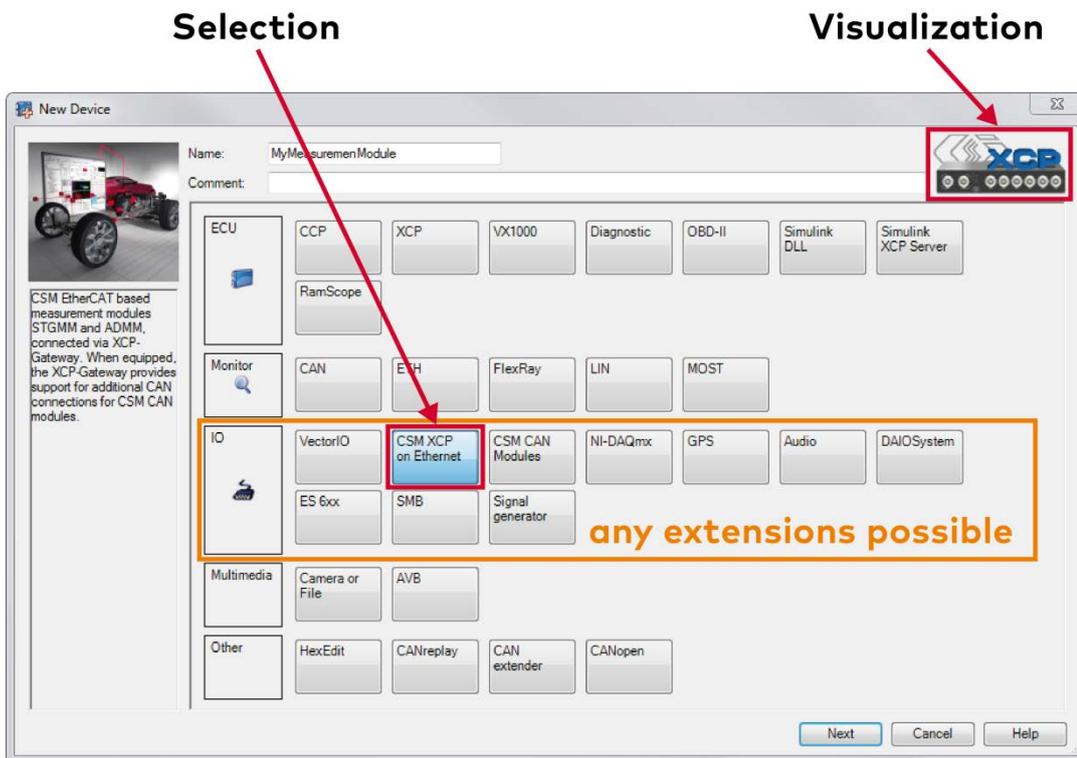
Measurement Data Transmission: Data is transmitted to the PC and to CANape via any interface. Depending on the computing power of the PC and the hard disk speed, data rates of over 200 Mbyte/s can be realized via the DAIO interface.

2.1   Implementation

Vector offers the development of the hardware driver as a service. If you decide to develop it in-house, the following information is available to you free of charge:

> Description of the DAIO interface in English and German

> Development Kit for developing the driver

> Demo implementation in C++

2.2   Project Examples

Integration of the QuantumX Product Family from HBM

A vehicle manufacturer approached to HBM and Vector because it wanted to use the HBM hardware for measuring with CANape. HBM developed the driver in order to acquire the measurement data from the QuantumX hardware with CANape.

Integration of the Kistler Indication System KiBox in CANape

To optimize combustion analysis with CANape for a vehicle manufacturer, the KiBox indication system from Kistler was integrated in CANape. The development of the DAIO driver was performed by Vector.

Human-Machine Interface: Monitoring Driver Behavior

In order to provide information on where a driver looks during driving, two different systems (faceLAB and Dikablis) for eye tracking were integrated in CANape. One system consists of eyeglasses with fitted cameras that acquire the position of the eyes. The other solution monitors the driver using cameras that are mounted on the dashboard. Both systems forward the eye position data to CANape using their individual protocols. Vector developed the drivers required for that.

Existing integrations of measurement systems via the DAIO interface:
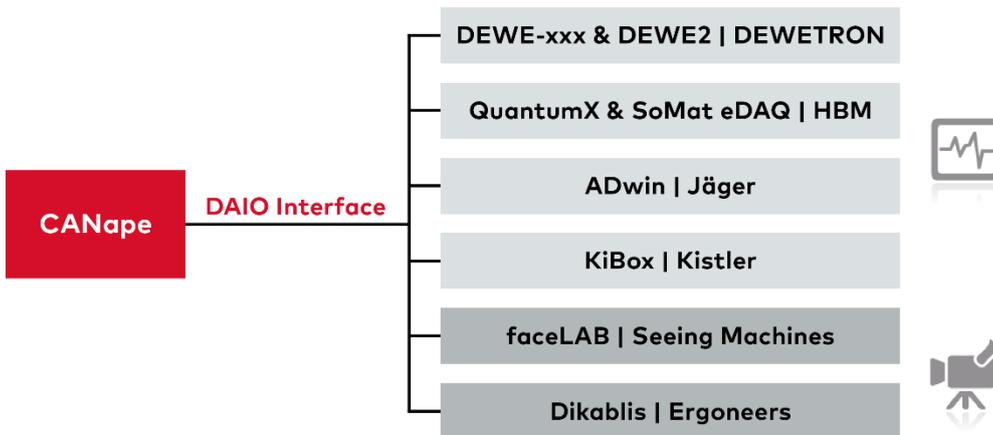
3   Integration of Cameras

CANape accesses video data via the DirectX interface. Not every camera system provides a suitable driver. So that you can still record the data of your favorite system, such as heat pattern cameras, with CANape, Vector will develop a special driver for it.

4 Communication Using Proprietary Protocols

Do you use a proprietary protocol for communication with the ECU or another system, such as a controller for a climatic chamber? Then you also need a tool solution for communicating with your ECU/system. These protocols can be transferred to XCP via an XCP-on-DLL interface.

All possibilities of CANape are then open to you, and you can simultaneously use your internal communication solution without investing resources into the development of your own tool chain.

4.1 Project Example

Integration of an ECU Platform via a Proprietary Protocol

A supplier has chosen not to use standard protocols in its ECUs and is implementing a proprietary protocol. To avoid having to develop and maintain a proprietary measurement and calibration tool as well, Vector wrote a driver that maps the specific protocol onto XCP. Users then have access to all possibilities of CANape.

5 vCDMstudio Plug-Ins for Optimization of Parameters

Expanded views often allow parameters to be assigned more easily than when using a view with values only. For example, existing point clouds of measurement data help during map optimization. Instead of generating a complete proprietary tool for this, it is worthwhile to use the many different high-performance functions already included in vCDMstudio (for instance A2L parsing and CDF2.0 file writing) and to build on this by implementing the company's own requirements.

A plug-in interface for proprietary calibration applications is available for this in vCDMstudio. This provides you with the following advantages:

> You have an integrated powerful C# development environment for implementing your requirements

> You access a variety of standard functions via the API

> You concentrate on solving your tasks thanks to a development environment

5.1 Project Examples

Deriving Model Definition from Measurements: MAP Fitter Plug-In

The relationship between a physical quantity and various driving situations is measured (such as soot particles as a function of different speed or load conditions). A model is to be developed from the measurements and is to be stored as a map in the ECU. The underlying measurement file is loaded in the plug-in for this, a map with two axes – speed and load – is created, and the values of the soot particle measurement are represented as a point cloud over the axes. The map that corresponds to the values of the measurement is generated from this.
More information in the video on YouTube.

Calibration Expert System Plug-In

This plug-in provides user interfaces for non-calibration engineers. The complex dependencies between parameters are hidden from the user using simple control elements. Configuration is simplified with the plug-in. Internal rules set the dependent parameter values automatically.

Gearshift Calibration Plug-In

A plug-in for the calibration of a dual clutch transmission was implemented in this project. The plug-in provides algorithms and operator controls that make application easier.

Function Inhibition Matrix

The "Inhibit Editor" supports the engineer during calibration of function cutoffs in the ECU. Through the editor plug-in, the dependencies of error codes on functions are represented as a matrix. The editor plug-in is contained in the vCDM product.
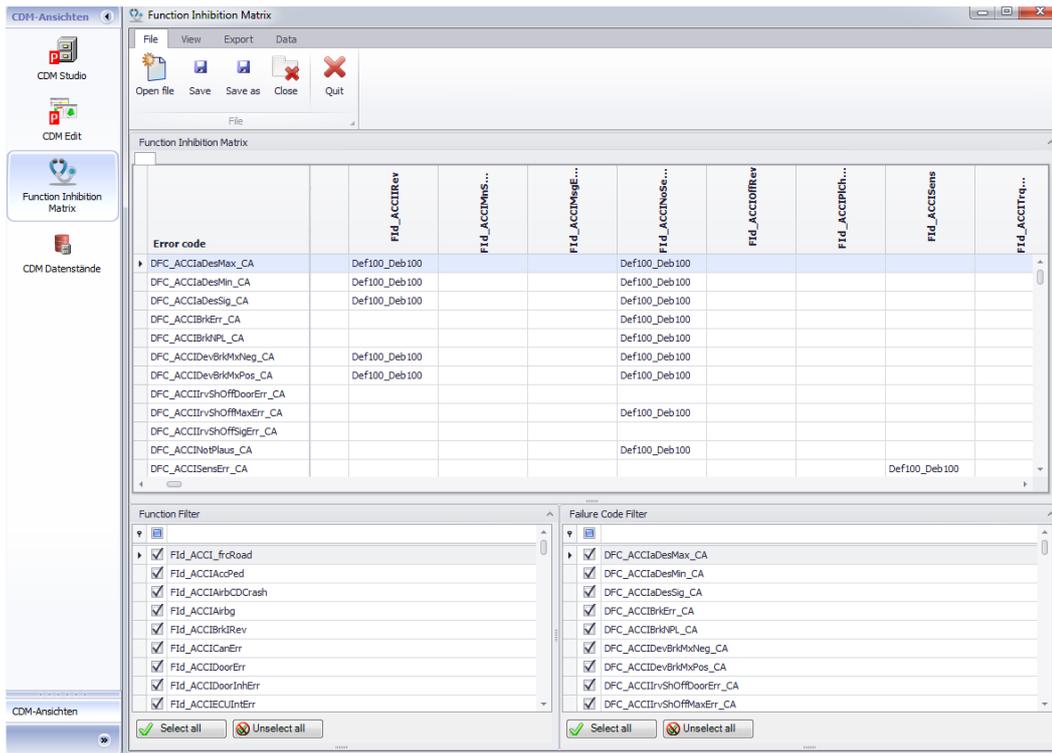
The Function Inhibition Matrix allows the configuration of relationships between the functions and error codes in a clear display.

6   Contact & Information

Inquire about a customized solution for adapting CANape to your applications:
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You will find further information on the following Internet pages:

>   **CANape**

>   **vCDMstudio**

>   **vCDM**

>   **Downloads** (Demo Version, Technical Articles, Application Notes …)

>   **Webinar recordings**

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