

## Product Information CANoe.Ethernet

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### Documentation Note

Valid for CANoe.Ethernet from Version 8.2.

This document presents application areas and functions of Option .Ethernet for CANoe.

CANoe.Ethernet expands standard CANoe functionality. You will find **product information** and **technical data** on basic CANoe functions in separate documents.

Please consider the environment before printing this document.

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# 1 Introduction

Ethernet-based networks and the protocols built upon them continue to grow in importance in the embedded environment. In contrast to IT networks in the office area, the main focus is on transmission of most periodic signals. Furthermore, real-time Ethernet systems generally react sensitively to disturbances of connected analysis tools. Option .Ethernet lets you extend CANoe by adding support of Ethernet systems. Exclusive use of Ethernet interfaces on the PC prevents Windows and other applications from affecting the real-time Ethernet system. When using the VN5610 interface hardware, it is also possible to spy on point-to-point connections.

## 1.1 Overview of Advantages

- > Linking of a database enables access to signal and RPC parameters.
- > Perfect interaction with the VN5610 interface hardware enables spying on point-to-point connections.
- > Data traffic can be simulated and analyzed without disturbing effects of the operating system.
- > Simulation and stimulation on various protocol levels (layers 2 through 7) with the ability to generate protocol errors
- > Processing of Ethernet packets and signals extracted from them in CAPL
- > Send out user-configured (even faulty) Ethernet packets configured with Ethernet Packet Builder
- > Cyclic sending and simple IPv4 socket communication with the Ethernet Interactive Generator
- > Programmable sending of packets in CAPL and in .NET
- > Simulation of TCP and UDP client sockets (IPv4 and IPv6) with independent instances for each CAPL node
- > Simulation of Ethernet nodes and gateways
- > Representation of all vehicle networks referenced to a common time base
- > Testing of gateway functionality by analyzing the communication on different bus systems

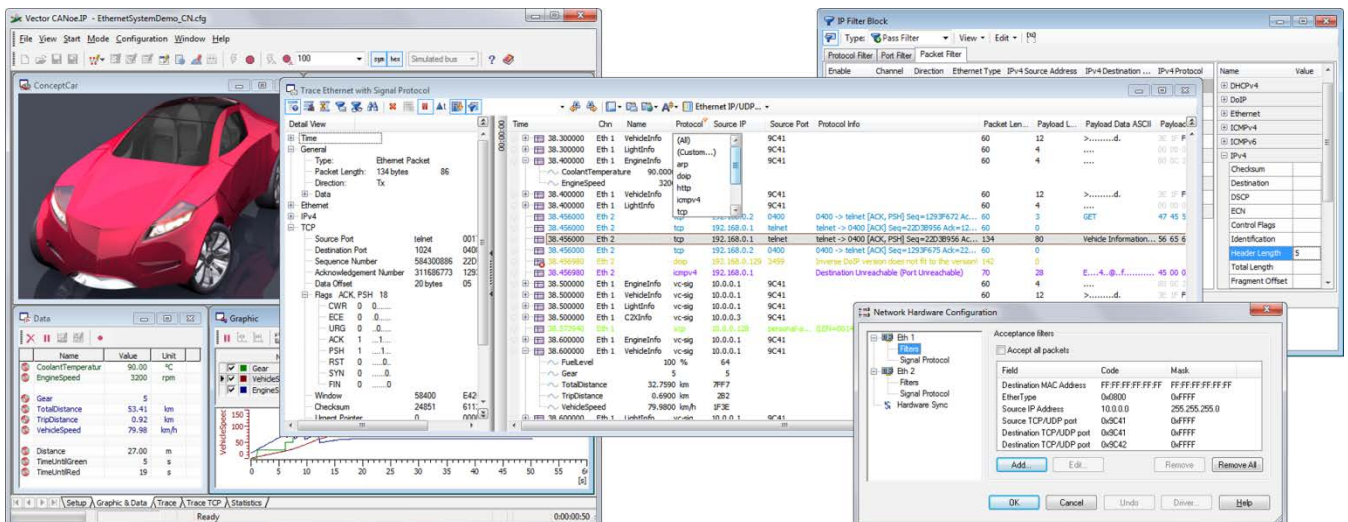


Figure 1: CANoe.Ethernet configuration for simulating and analyzing signals in the Trace window and active filter for data reduction.

## 1.2 Application Areas

In supporting Ethernet-based networks, in vehicle development the same use cases generally occur as in CAN bus systems, especially in such areas as video data transmission, Ethernet as a broadband backbone network, diagnostics over IP (DoIP) and communication between electric vehicles and charging stations. A special advantage of CANoe.Ethernet is that it can be used to measure delay times when gateways convert signals for other vehicle networks. For example, this makes it possible to track diagnostic information throughout the entire vehicle and check it for consistency. Furthermore, it is possible to reproducibly test embedded implementations and to increase their robustness in handling protocol errors by intentionally sending corrupt Ethernet packets.

## 1.3 Further Information

- > [Vector Download Center](#)  
Various documents related to CANoe are available on the Internet. In the Demo version, for example, you get sample configurations for the various use areas and detailed online Help texts, in which all CANoe functions are described. In addition, you benefit from our valuable know-how in the form of technical articles and application notes.
- > [CANoe Feature Matrix](#)  
More information on variants, channels and bus system support is presented in the feature matrix.

## 2 Functions

Option .Ethernet extends the functional range of CANoe by adding Ethernet-specific functions:

- > Configuration of up to 32 Ethernet channels
- > Supports the Vector VN5610 Ethernet interface and PC Ethernet interfaces
- > No effects on network communication by the Windows operating system or other applications thanks to the isolated Ethernet interface. This may be a necessary requirement especially in real-time systems.
- > Linking to a FIBEX-4.x based database enables use of signal and RPC parameters.
- > Supports Ethernet and Ethernet-based protocols such as VLAN, AVB, IP, UDP, TCP, SOME/IP and DoIP
- > Various filter options (Hardware/Measurement Setup/View)
- > Display of protocol header information in the Trace window
- > Use of your own signal protocol decoder DLLs
- > Ethernet Packet Builder for configuring and sending Ethernet packets
- > Ethernet Interactive Generator for periodic sending
- > Function library for Ethernet access from CAPL or .NET
- > Interaction layer for simulation of ECUs based on SOME/IP
- > Separate TCP/IP communication software instances for each CAPL node (IPv4 and IPv6)
- > Logging of data traffic, including Rx/Tx direction and channel

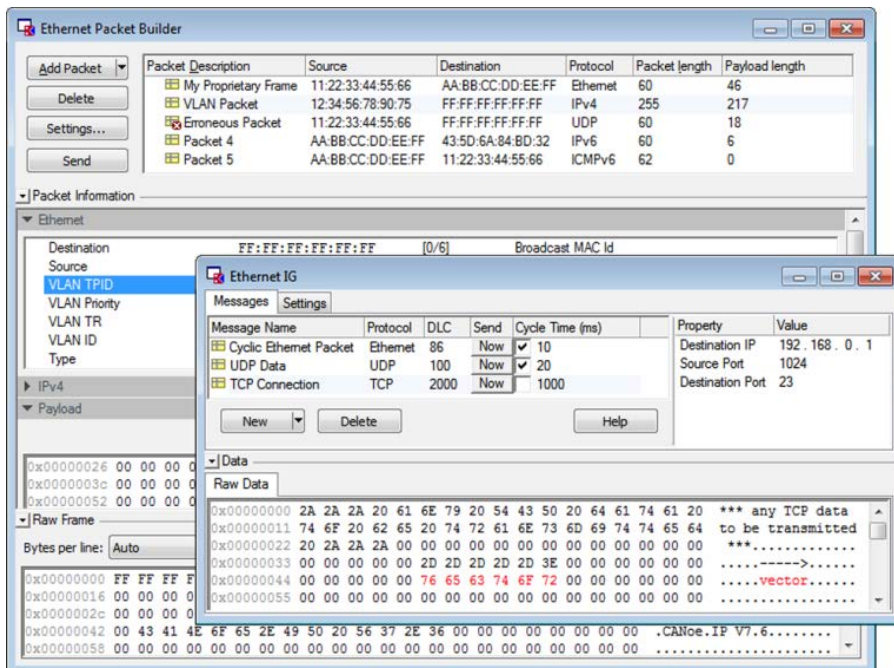


Figure 2: Ethernet Packet Builder and Ethernet Interactive Generator is used to create and send out Ethernet frames conveniently and without programming

### 3 Hardware

At least one Ethernet interface is required to analyze Ethernet communication. The interface that is used may be the Vector VN5610 Ethernet interface or the Ethernet interfaces available at the PC. The VN5610 is an Ethernet interface that was specially designed for measurement purposes, and it offers specific advantages such as high resolution of time stamps, synchronization with other Vector bus interfaces, spying on point-to-point connections and support of automotive-specific physical layers such as BroadR-Reach. You will find more detailed information online at: [www.vector.com/vi\\_vn5610\\_en.html](http://www.vector.com/vi_vn5610_en.html)

### 4 Trainings

In the framework of our training program, we offer various training courses and workshops on IP/Ethernet and CANoe at our classrooms as well as at your business site.

For more information on individual training events and a schedule, please go to: [www.vector-academy.com](http://www.vector-academy.com)

### 5 Hint

CANoe.Ethernet includes software developed by the University of California, Berkeley and its contributors.

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