



CANalyzer .Ethernet

Product Information

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Valid for CANalyzer .Ethernet of version 10.0.

This document presents the application and functions of the Option .Ethernet for CANalyzer. CANalyzer .Ethernet extends the standard functionality of CANalyzer.

Product information and **technical data** for the basic functions of CANalyzer can be found in separate documents.

1 Introduction

Ethernet and IP-based networks, as well as the application protocols which build upon them, are state of the art in the automotive field. Typical areas of use include control loops, assistance systems, backbones and multimedia. The need-based design of a network which takes bandwidths and real-time capacity into account, as well as the physical transmission layer used, play a main role when it comes to expenses. Therefore tools for checking the network parameters named earlier are extremely helpful in every phase of development.

With the .Ethernet option, you can expand CANalyzer to include support for Ethernet networks. The exclusive use of Ethernet interfaces prevents unwanted interference of the real-time Ethernet system by Windows or other applications. When using the VN5600 interface hardware family, it is also possible to monitor point-to-point connections, thus avoiding changes in the topology for measurement.

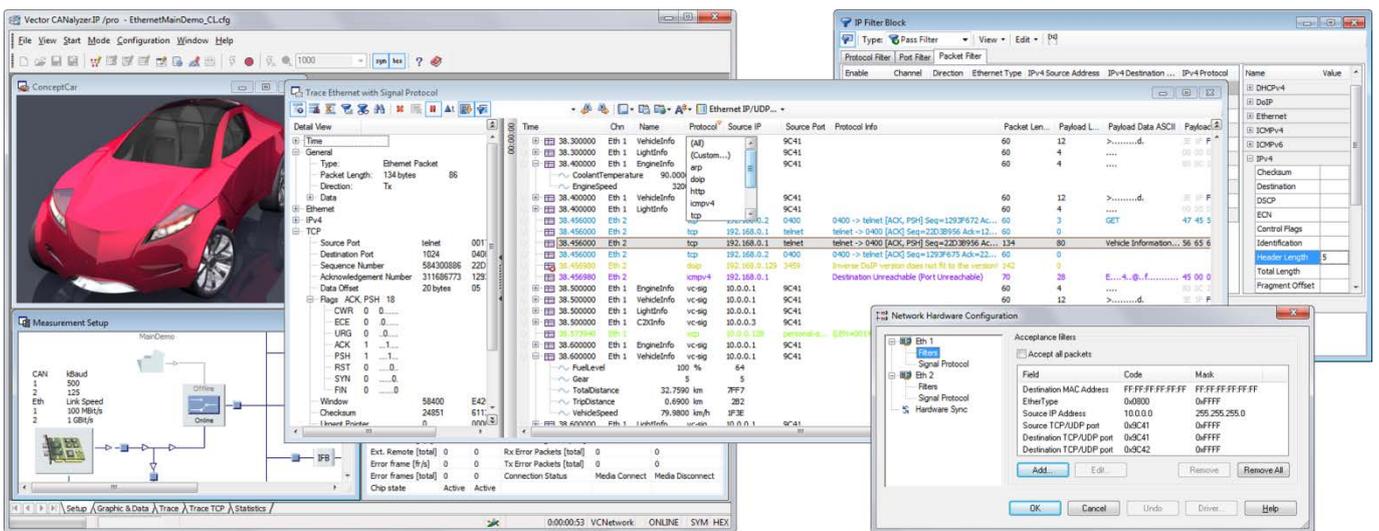


Figure 1: CANalyzer.Ethernet configuration for displaying signals. The Ethernet protocol and signal decoding are analyzed in the Trace window.

1.1 Overview of Advantages

- > The integration of a database (FIBEX, AUTOSAR ARXML etc.) enables direct access to signal, service and RPC parameters.
- > Perfect interaction with the interface hardware family VN5600 enables the monitoring of point-to-point connections and the and the topology-true simulation/stimulation
- > Data traffic can be analyzed without disturbing effects of the operating system.
- > Send out user-configured (even faulty) Ethernet packets configured with Ethernet Packet Builder
- > Representation of all vehicle networks referenced to a common time base
- > Analyze gateway communication on different bus systems
- > Recording and playback of logging files of various bus systems

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 CANalyzer .Ethernet is the measurement of delay times during signal conversion by gateways to other vehicle networks. This allows, for example, diagnostic information to be tracked through the entire vehicle and its consistency to be checked. With the help of support for typical automotive database formats (AUTOSAR ARXML or Fibex) and protocols (SOME/IP, DoIP, ...), users can directly access the application signals. This enables or simplifies the analysis of communication and application data considerably.

In conjunction with the VN5600 Ethernet interface family, errors on the Ethernet protocol layer 2 (Data Link Layer) can be reliably detected, displayed and stimulated. Typical automotive physical layers such as IEEE 100BASE-T1 (OABR) or 1000BASE-T1 are also directly available.

1.3 Further Information

> [Vector Download-Center](#)

Various documents related to CANalyzer 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 CANalyzer functions are described. In addition, you benefit from our valuable know-how in the form of technical articles and application notes.

> [CANalyzer 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 CANalyzer by adding Ethernet-specific functions.

- > Configuration of up to 32 Ethernet channels (an Ethernet channel may comprise multiple Ethernet ports. The amount of usable ports is limited by the computing power of the used PC)
- > Support for the Vector VN5600 series of Ethernet interfaces 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.
- > The integration of a database based on FIBEX-4.x or AUTOSAR3.x/4.x enables the use of signal and RPC parameters.
- > Support for Ethernet and Ethernet-based protocols such as VLAN, AVB, IPv4, IPv6, ICMP, DHCP, UDP, TCP, SOME/IP and DoIP
- > Various filter options (Hardware/Measurement Setup/View)
- > Display of protocol header information in the Trace Window, as well as breakdown of the Ethernet frames into individual PDUs
- > Use of individual signal protocol decoder DLLs for proprietary protocols based on Ethernet and UDP
- > Ethernet Packet Builder for configuring and sending Ethernet packets
- > Recording of data traffic, incl. Rx/Tx direction, channel and time stamp

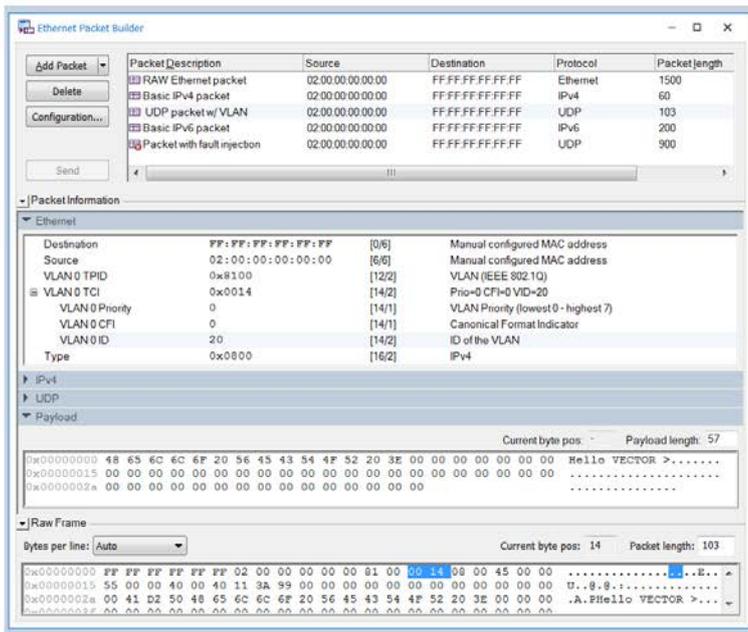


Figure 2: Ethernet Packet Builder is used to create and send out Ethernet frames conveniently. Correct as well as faulty packets can be easily created using the configurable checksum and length calculation

3 Hardware

At least one Ethernet interface is required to analyze Ethernet communication. Either a Vector Ethernet interface (e.g. VN5600 series) or the Ethernet interfaces available on the PC can be used as the interface. The VN5600 series of Ethernet interfaces is 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 100BASE-T1 (OABR) and 1000BASE-T1. You will find more detailed information online at: [VN5610](#).

4 Trainings

In the framework of our training program, we offer various training courses and workshops on IP/Ethernet and CANalyzer 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

5 Hint

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



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