

CANape Advanced Multimedia Option

Object Verification for Driver Assistance Systems

The Advanced Multimedia Option extends the CANape measurement, calibration, and diagnostic tool by adding a verification solution for driver assistance systems. Even with just the basic version of CANape this option enables time-synchronous recording and displaying of ECU-specific parameters, CAN, LIN, and FlexRay bus messages, and analog, digital, GPS, audio, and video signals.

Features and Advantages

Compared to the basic version of CANape, the Advanced Multimedia Option is capable of displaying objects recognized by ECUs as a video image that is recorded synchronously to the measurement. Based on object data computed by the ECU, geometric symbols or bitmaps are superimposed on the video image at specified points on the image. The user can verify the ECU's object recognition algorithms by comparing recognized objects to the real environment. Ease of configuration, high flexibility, and user-friendly control are qualities of the Advanced Multimedia Option.

Functions

The Advanced Multimedia Option can be used to superimpose objects recognized by the ECU (vehicles, lane markers, traffic signs, etc.) in perspective on the video screen and to simultaneously show them in a separate, user-scalable display from side view or bird's eye view.

Application Areas

The flexible configuration capabilities of the Advanced Multimedia Option cover a wide range of application areas in the development of driver assistance systems. They can be used to:

- > Check object recognition algorithms for ACC (Adaptive Cruise Control), "stop and go" systems, and parking assistance systems with the help of object overlaying
- > Develop lane keeping systems or adaptive lighting for curves and display driving lanes as curves
- > Provide useful testing support of traffic sign recognition systems with linking of bitmaps

Calibration of the Camera

A coordinate transformation is needed to display object data from the ECU as geometric objects in the Video Window. In calibration mode the video camera is aimed at a number of reference points whose coordinates are known. Clicking these reference points causes CANape to automatically determine the coordinate transformation coefficients. The coordinates of the reference points are saved in a calibration file. This makes it easy to transfer them to other computers, and they can be reused later for recalibration. The calibration process only needs to be performed once, unless the system configuration (type and location of the camera) is changed.



Evaluation of objective sensor data and subjective impressions during in-vehicle tests: Display of objects from bird's eye view and superimposed on the video image of the Multimedia Window

New functions of Version 7.0:

- > Checking of Parking Assistant function via new object type
- > GFX Editor extension: It now enables easy configuration of array measurements, central setting of object parameters and the use of color functions such as color response curves

Creating the Configuration

The properties of objects to be displayed, i.e. the relationship between real objects and their display on the screen, are stored in the Object Signal Mapping file.

This file contains the flexible mapping of all parameters, i.e. measurement variables and preset constant variables, to display objects (X, Y, Z coordinates, size, color, text and numeric fields, etc.). Numerous standardized, predefined symbolic objects such as crosses, squares, triangles, and lines are available for representing objects. Saved bitmaps may also be used to represent objects. An open interface allows the user to integrate customer-specific expansions, e.g. for displaying curves. For more intuitive evaluation of the display it is possible to combine individual objects into groups. The GFX Editor supports the user in creating and managing the object-signal mapping file.

Display and Evaluation

The video image's coordinate system represents, in real-time, object data that CANape acquires and saves as measurement signals; representation features include:

- > Perspective views and time-synchronous display of the evaluated object information in the video image
- > Continuously adjustable object display (from side view to bird's eye view) with variable grid size (X, Y, Z elongation)
- > To achieve an optimum display for online or offline evaluation purposes, objects can simply be selected by numeric input (e.g. object numbers 1-5, 6, 8-10) or by preconfigured groups

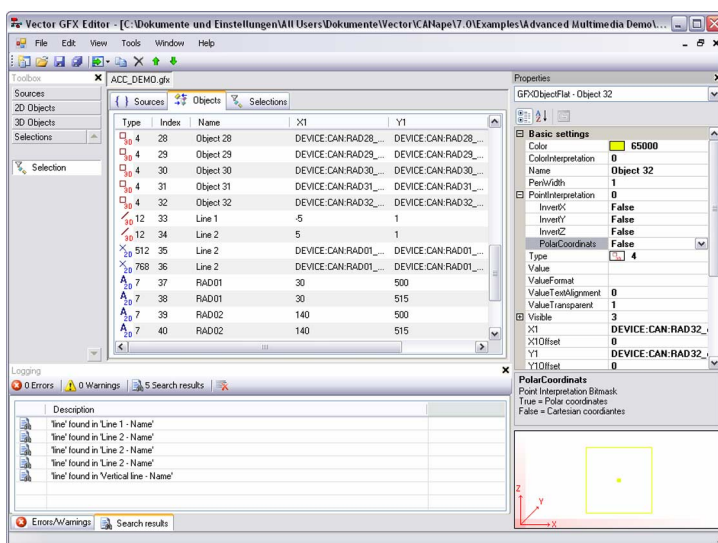
- > Objects, texts, and parameter values can be drawn as supplemental information at fixed or variable pixel positions
- > Relative speed and lateral deviation can be displayed as horizontal and vertical excursion lines
- > Textual and numeric information on the object can be located on the screen with adjustable spacing
- > Post-measurement adjustment of all object parameters (size, color, text and numeric fields, etc.) for offline processing

Hardware Interfaces

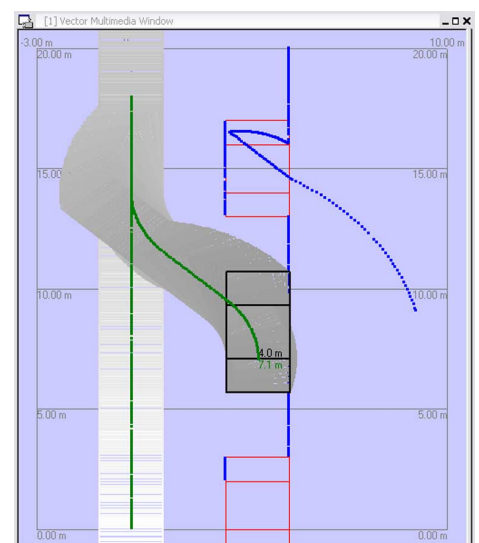
To record video signals Vector offers a USB camera with tested driver. In principle, all USB or Firewire cameras with DirectX (DirectShow) support may be used. Furthermore, it is possible to connect an analog camera via a Frame Grabber interface.

System Requirements

- > Windows 2000, XP or Vista
- > CANape Graph 5.6, CANape 6.0 or higher
- > PC resources (CPU, memory size, graphics card, speed of hard disk drive) must be matched to the camera resolution, frame frequency, and compression
- > Sufficient hard disk memory space (data rates of up to 20 Mbyte/s when recording uncompressed video data)
- > Supported CAN interfaces: e.g. Vector XL product family
- > USB camera/Firewire camera or Frame Grabber interface



Using the GFX Editor to conveniently perform object-signal mapping and grouping for object display



Display and checking of Parking Assistant function