

CANoe.ISO11783, Version 5.1

Development, Simulation and Test of ISO11783 Systems

ISO11783 (or ISOBUS) is a J1939-based CAN protocol for communication in the agriculture industry. ISOBUS is a CAN-based multi-master network whose protocol has been harmonized with J1939. This means that both systems may be used in parallel in the same network or segment.

Features and Advantages

ISO11783 standard allows the user to analyze and simulate complex communication structures easily and efficiently. By provision of examples such as Virtual Terminal (VT) and Tractor ECU the main components of an ISO11783 network are delivered.

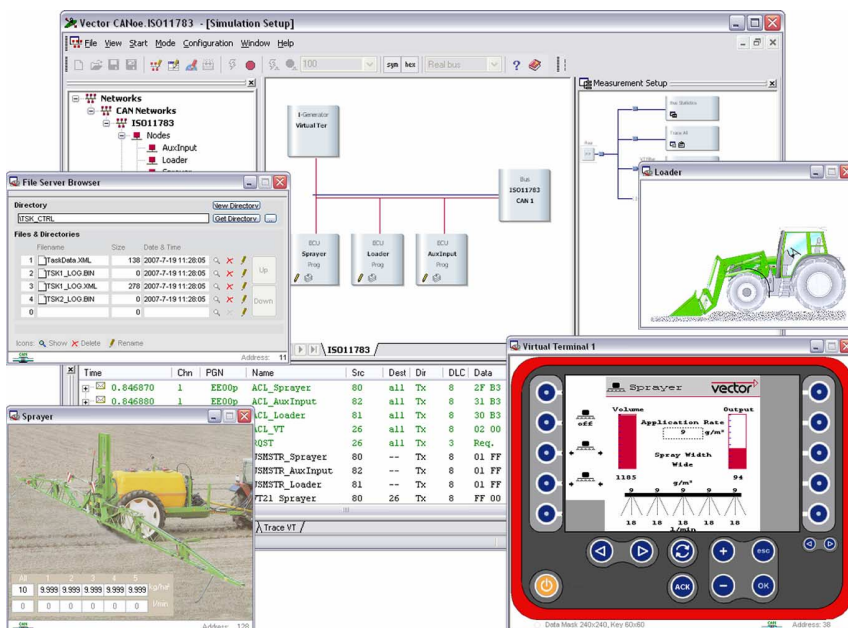
CANoe.ISO11783 supports systems of implementation level 2, 3 and beyond. The user can work with parameter groups and signals defined in the ISO11783 standard. The same communication analysis characteristics apply as described in CANoe.J1939. In addition, the examples can be adapted easily to particular circumstances. Quick access to CANoe.ISO11783 is thus guaranteed.

Functions

CANoe.ISO11783 contains CANoe.J1939 functionality and expands upon it to include:

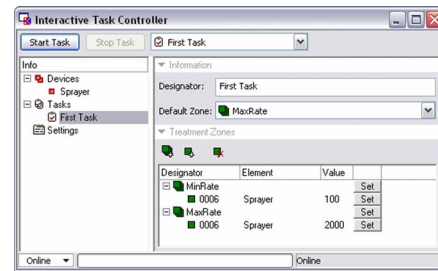
- > Simulation of the Virtual Terminal
- > Simulation of a File Server
- > GNSS display and simulation
- > Graphic display of the network nodes
- > Support of all transport protocols
- > Expanded CANdb database
- > Simulation of individual components
- > Process data access dialog
- > Interactive Task Controller

These functions will be described in detail below.



Sample configuration of CANoe.ISO11783 with File Server, simulation of two implements and Virtual Terminal

**The Interactive Task Controller
enables an easy and quick access
to the process data of an implement**



Application Areas

CANoe.ISO11783 is suitable for the design, diagnostics, and testing of ISO11783-based networks and components.

CANoe.ISO11783 gives the user an optimal tool that can be used from development to end-of-line testing.

Hardware Interfaces

CANoe.ISO11783 runs with all hardware supported by CANoe. The use of electrically isolated bus drivers such as the CANcab251opto is recommended.

Virtual Terminal Simulation

CANoe.ISO11783 offers all of the functionality needed to simulate a Virtual Terminal (VT). The user can choose between two variants: CAPL-based or an easy-to-use VT dialog. The CAPL-based variant lets the user adapt the simulation to specific requirements by programming. The dialog Variant enables simulation of a VT without requiring programming knowledge.

Great importance was placed on the flexible description of the terminal properties. For example, the user can configure the simulated terminal so that it supports a color or black and white display. The number of "Softkeys" and the screen resolution are also freely configurable. With this tool, the user can test all terminal variants and operating concepts in practical situations.

Besides its use for pure simulation, the VT can also be run passively in the network as a reference. In this case, the CANoe Virtual Terminal does not actively participate in CAN communication, rather it listens to the communication between an implement device and the real terminal. This makes it easy to reveal compatibility problems of the real VT quickly. In addition, the passive VT operating mode is well-suited to the analysis of previously recorded bus traffic. Problems in communication can be visualized immediately using the CANoe VT, simply by playing back a log file. This simplifies the time-consuming analysis of the CAN data traffic and its potential effects on the application level.

Interactive Task Controller

An easy to use process data dialog allows access individual data of any implement. If available CANoe can read in standardized XML files to query implement information or receive it directly from the implement via CAN. A Nodelayer DLL is available for simulation of an object directory in CAPL. The DLL handles communication with the task controller and sets up the object directory. With the help of DDI (Data Dictionary Identifier), the CAPL program can read out information from the object directory and modify it. The Nodelayer DLL also automatically provides logging data requested by the task controller.

New functions of Version 5.1

Extension of the Virtual Terminal

- > VT support for implementation level 4 is adapted to the latest draft.
- > Language can be selected during the measurement.
- > Data and Softkey Mask of a Working Set can be adapted to the size of the Virtual Terminal window.
- > Virtual Terminal window opens faster.

Button for time-synchronous display

- > The time-synchronous display of data can be activated with the help of a button.

CANdb++ Editor optimized for messages with DLC>8

- > Simplified arrangement of signals for messages with DLC>8Byte

CAPL extension

- > The assignment operator supports parameter groups with DLC>8Byte.

Optimized DTC Monitor

- > The multiple selection of nodes allows targeted representation of error codes.

Error messages with time stamp

- > Error messages regarding transport protocols contain a time stamp in the Write Window. This simplifies analysis of cause in the Trace Window or in the log file.

Revised J1939 Scanner

- > The view is optimized for dynamic networks, which significantly simplifies tracing and analyzing changes in the network configuration.

Analysis, GNSS

In addition to the functions of CANoe.ISO11783, the user has access to a GNSS Monitor (GPS). This allows the recording and representation of saved paths. At the same time, speed or elevation information for any point in time can be seen with a colored background. The NMEA2000 Fast Packet Transport Protocol, which is used for the transmission of GNSS (GPS) data, is also supported. In order to reduce the quantity of data displayed, there is a special filter available that filters out parameter groups using source and destination addresses.

With the GNSS node layer DLL or an optional dialog, the user can define paths that will then be taken by the GNSS Simulator. Thus expansion devices can be simulated easily. The realization, with the aid of the node layer DLL, also allows complex simulations that take into account feedback of systems, e.g. speed and direction changes.

After stop of measurement, the GNSS Monitor, Graphic Window and Trace Window can be synchronized for the subsequent analysis. Starting from location information in the GNSS Monitor the user is lead to the respective parameter group in the Trace Window or gets a measuring point in the Graphic Window at the corresponding point in time or vice versa.

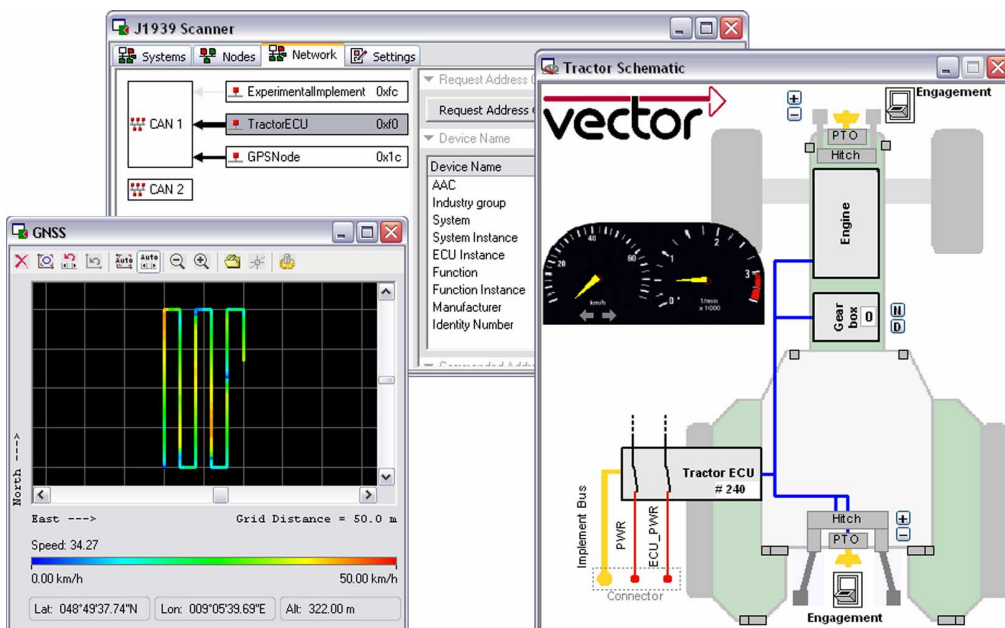
Graphical Display

The Scanner monitors the communication and provides a clear display of all network nodes. Especially changes in a dynamic network can be easily traced and analyzed. Address changes are briefly highlighted. Time stamps for the first appearance and the last address change of a node are also available as are warnings regarding occurrence of protocol violations and notes about unusual occurrences in communication. Synchronization of information with the Trace and Graphic Window is possible. If necessary, a central and clear reconfiguration of the node addresses can take place. In addition, information about function, manufacturer, and affiliation to a Working Set are output.

Transport Protocols

With the use of transport protocols such as BAM, CMDT, and ETP, CANoe.ISO11783 can reassemble the individual fragments. Communication is monitored for errors during measurement and, if necessary, warnings are output.

The interpretation of the ISO11783 protocol is limited to the channel configured by the user. Gateway solutions with various protocols can thus be monitored easily. Display of 29 and 11 bit CAN identifiers is supported at the same time.



CANoe.ISO11783 with GNSS Monitor and schematic representation of a tractor

Training

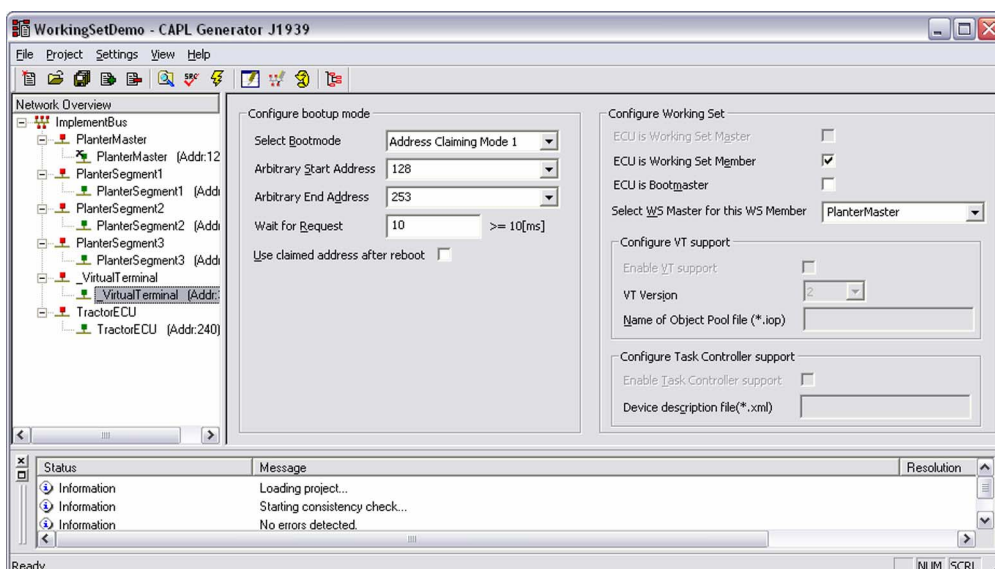
As part of our training program, we offer a range of classes and workshops on CANoe.ISO11783 in our classrooms and on-site at our customers. For more information and the dates of our training courses, please visit our homepage on the Internet at: www.vector-academy.com

Database

ISO11783 parameter groups and signals are described in a database, which already contains predefined standard objects that serve as examples. This database is already filled with all standard objects. The user can expand the database using the editor (included with delivery). This makes it possible to define application-specific parameter groups, for example. Parameter groups and signals thus defined can be selected symbolically in the entire program.

Simulation of Individual Components

The simulation of individual network components is simplified greatly through specific functionality. For the creation of communication, a CAPL code generator is available. With the aid of a graphical interface, the user can generate and configure the CAPL models. Stepwise development is supported. The generated models can be read back and changed with the CAPL code generator. Even written code does not get lost. A Nodelayer DLL is also available for programming. This makes available additional functions such as network management, transport protocols, etc.



With the aid of the integrated ISO11783 CAPL Code Generator, a rapid realization of ISO11783 models is possible