vMeasure exp
Acquisition and Analysis of Measurement Data Using vMeasure exp

Dr. Alexander Sundt
vMeasure exp Overview

What is vMeasure exp

- A flexible measurement software solution for reliable acquisition and efficient evaluation of measurement data.
- Various signal sources support
- Powerful functionalities
- User friendly
vMeasure exp Overview

Supported Measurement Hardware

- CAN- and EtherCAT- based measurement hardware
- XCP on Ethernet based measurement hardware
- DAIO interface for the individual support of other measurement hardware
- Audio, video and GPS devices via USB
- ECU interface with protocol XCP on CAN, LIN, FlexRay and Ethernet
- Signal acquisition on automotive bus systems and via OBD-II
vMeasure exp Overview

Display of Measurement Data
Display of Measurement Data

- Individual, flexible and signal specific presentation of measurement values

- Windows:
  - Measurement Windows
    - Graphic window
    - Numeric window
    - Bar window
    - Digital window
    - Text window
  - GPS window
  - Video window
  - Panel window

- Cursors:
  - Single measurement cursor and difference cursor
  - Time synchronous analysis of measurement data including GPS and video with global measurement cursor

- Signal presentation
  - Color functions to improve the data visualization (e.g. out of range values...)
  - Legend with additional information in customizable, compact table format
The **Symbol Explorer** offers access to signals, the measurement setup, functions, recorder settings and window templates.

- **Grouping of signals in folders:**
  - **Signals** shows at a glance a flat list of all signals in the measurement configuration.
  - **Signal Sources** organizes the signals according to measurement devices and calculated signals.

- **Measurement Setup** represents the configured measurement devices according to the bus interfaces they are connected to.

- **Function definitions** contains the pre-defined library functions and the project specific functions.

- **Recorder list** with the list of defined recorders.
Setup Measurement Configurations

- The network and device configuration is done by convenient and intuitive dialogs.
- Measurement set up and configuration extensions by
  - Integrated CSMConfig for CSM module configurations
  - Reference to the DBC description file for 3rd part measurement devices
  - Reference to an A2L parameter description file for CCP/XCP measurements
  - For OBD-II no CDD or ODX-file is needed
Calculated Signals

- With Measure exp calculated signals can be defined using a graphical formula editor
  - Algebraic expressions
  - Logical expressions
  - Trigonometric, exponential, logarithmic functions
  - Syntax check included

- More complex algorithms are possible with
  - Integrated scripting language
  - MATLAB/Simulink
  - Own DLLs

- Virtual signals are calculated during the measurement and are available as additional data
High-Speed Function

- Function dedicated to specific topics, e.g. e-motor
- Multiple- input / multiple- output function
  - Calculate multiple results in one step, e.g. active, reactive, apparent power, and phase shift between voltage and current of an AC powered system
- Guided configuration dialogs
- Improved computation performance
High-Speed Function

- Function dedicated to specific topics, e.g. e-motor
- Multiple-input / multiple-output function
  - Calculate multiple results in one step, e.g. active, reactive, apparent power, and phase shift between voltage and current of an AC powered system
- Guided configuration dialogs
- Improved computation performance

Target high-speed function: vMeasure exp 3.0

vMeasure exp 2.0
High-Speed Function

- Function dedicated to specific topics, e.g. e-motor
- Multiple-input / multiple-output function
  - Calculate multiple results in one step, e.g. active, reactive, apparent power, and phase shift between voltage and current of an AC powered system
- Guided configuration dialogs
- Improved computation performance

First benchmark with a regular PC adding two signals.
vMeasure exp Details

Support of Video and GPS

- vMeasure exp can record and display video signals and GPS positioning data to document test track and environment
- On one more Direct Show® video cameras and GPS sensors are supported
- Recorded videos are automatically **synchronized** with other measurement data
- GPS data is presented in online or offline maps
- Better and more significant analysis results are achieved by mapping the measurement data to the driving situation

![Map and Video Screenshot](image-url)
Thermodynamic state charts based on the material library TILMedia for TLK-Thermo GmbH

Various chart types available:
- Pressure-enthalpy (pH)
- Pressure-specific volume (pV)
- Pressure-temperature (pT)
- Temperature-enthalpy (TH)
- Temperature-entropy (TS)
vMeasure exp supports the multi-recorder concept to store measurement files during an online recording session.

- Signals to be recorded can be explicitly marked from the signal list.
- Trigger definitions to start recording based on specific signal conditions can be defined.
- Measurement data is recorded in the MDF 3.x or ASAM MDF 4.x format.
- Support of MDF4.1 format to store up to 4 GB data and 100,000 signals.
vMeasure exp Details

Reporting and Documentation

- Print view
- Header and footer
- Drag & drop
vMeasure exp

vMeasure exp Advantages

- Synchronous acquisition of measurement data of different sources including analog data, ECU-internal data, video and GPS data
- User friendly signal presentation in graphic, numeric, text windows and user-defined panels
- Open platform for the integration of measurement modules from 3rd party measurement technology suppliers by means of the DAIO interface
- Diagnostic support measuring OBD-II data
- Multi-recorder concept with individual trigger settings to focus on relevant signals and data
- Efficiency increase through automated procedures using scripts
- Supported of MDF4 file format for almost unlimited storage capacity
- Open and flexible platform based on standards
For more information about Vector and our products please visit

www.vector.com

Author:
Aleander Sundt
Vector Germany