ViCANdo Manual 2015 G2

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1 Introduction

ViCANdo is a general purpose application used to acquire data from multiple sources and record it to disk. ViCANdo is designed to also easily replay and analyze your recordings, but also support the use of other tools for i.e. post analysis.

A source can be anything from a Video camera, a GPS or a CAN interface. There is no theoretical limit about what kind of data that can be captured.

The captured data can always be re-played in real time with the purpose to later view and playback the data flow width high accurate time precision. To later display and analyze the data in trace and graph views. Recorded data can also be exported to other applications in several formats. The number or sources are not limited by ViCANdo, it can be expanded until the limits of your computer. Hence typical set ups of 4 cameras and 4 CAN channels is fully realistic to run on a modern laptop.

ViCANdo is based on state of the art technology and designed to be multiplatform, hence Windows, Android, Linux and Ubuntu is supported by default.

ViCANdo supports standard and established hardware for CAN and other busses, from Kvaser and Vector. Import and export of data is made possible in generally accepted formats from Kvaser and Vector. ViCANdo also supports other standard formats for communication as the .dbc format for CAN data bases.

ViCANdo is designed to be an open product, easy to integrate in a larger context and to be easily adjusted to new hardware and requirements for your measurement set up situation.

ViCANdo also have powerful scripting features, using JavaScript as the main scripting language.

1.1 Licensing

The licensee is authorized to produce a (single) backup copy. The conditions of the ViCANdo license agreement must be observed. The license is can be locked to a specific computer or a Kvaser CAN Interface.

The supplied software has a license number and a text entry for identification of the licensee. Both entries are displayed briefly when the program is started. This information can also be displayed by the menu item **Help -> About**. The licensee must take suitable precautions to prevent the production of any unlicensed copies from the version provided. If it becomes known to the licensee that a copy of his version is being used by third parties, the licensee is obligated to stop this usage immediately or to inform Zuragon. Otherwise, the licensee is liable to Zuragon for consequential damages

1.2 Supported platforms

ViCANdo is designed to be portable. In this the following operating systems are supported:

```
* Ubuntu 10.04 i386/AMD64 and later versions
* Windows XP
* Windows Vista
* Windows 7, 8
* Mac OSX
```

1.2.1 Minimum requirement

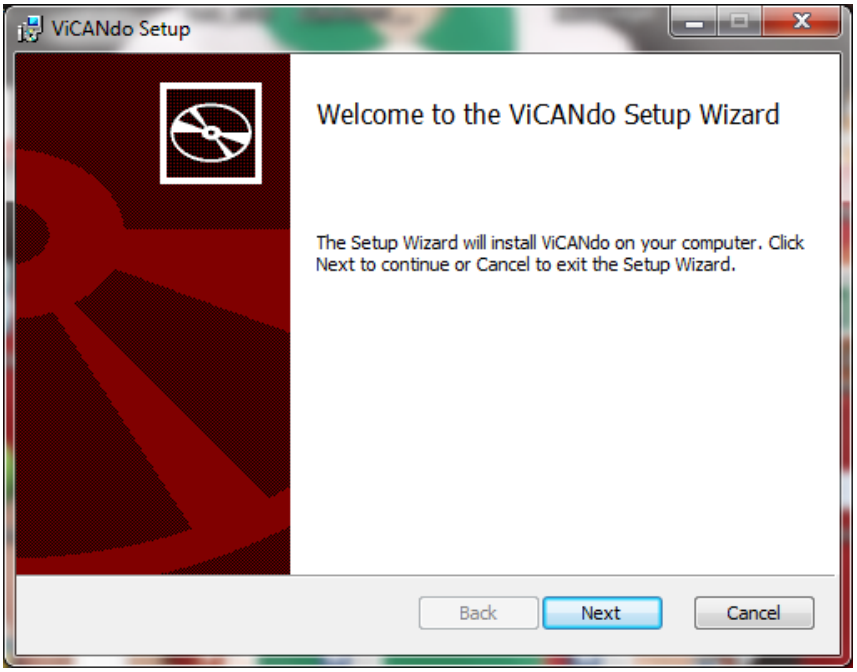
```
* 2 Gb RAM memory
* 2.0  Ghz CPU
* 30Gb free space - depends on much data that will be logged
```

1.2.2 Supported devices

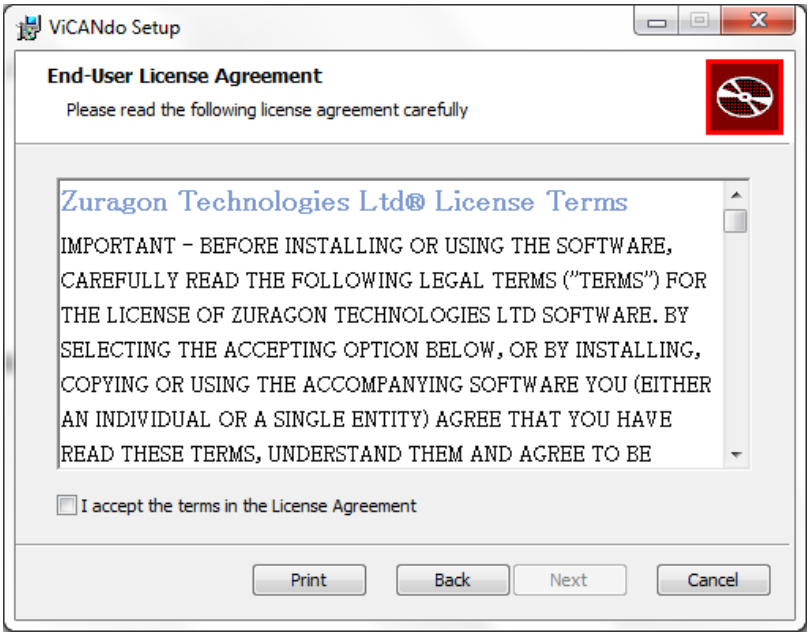
```
* All Kvaser interfaces supported by CANLib
* All Vector interfaces
* All DearBorn Group Interfaces
* Windows only: Video devices supported by Direct X 9.0 or later
* Ubuntu: Video devices supported by video4linux
```

1.3 Installation on Microsoft Windows OS

Just double click on ViCANdo SETUP.msi installation file. NOTE: the installation script is not signed, so warning will show up, just press "Run"



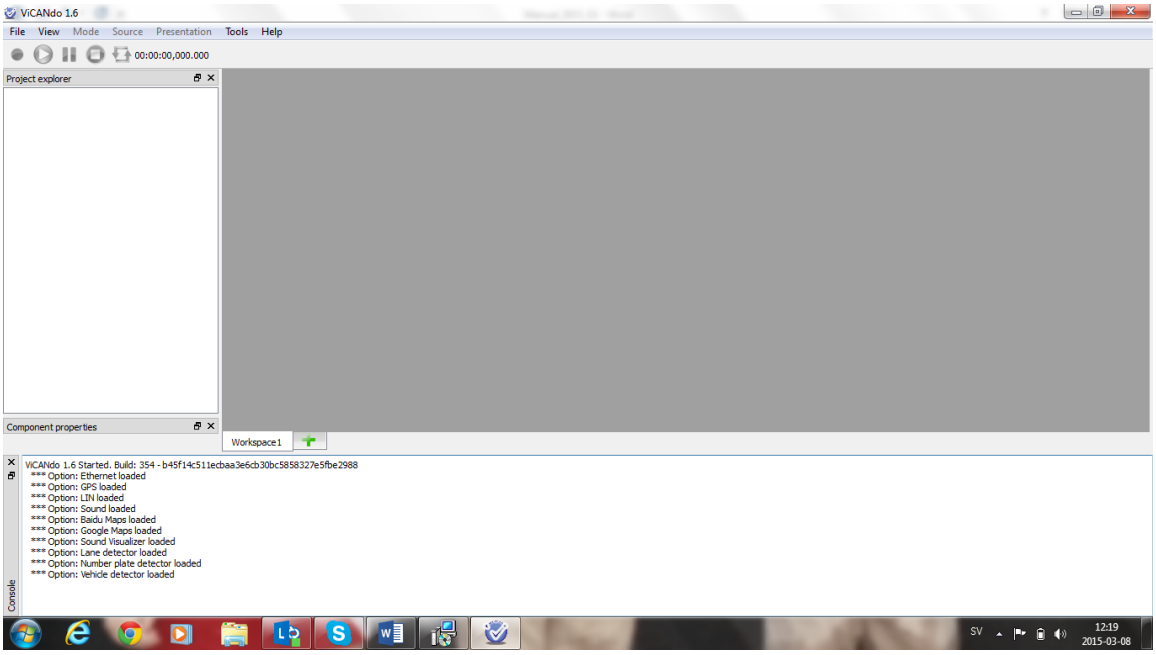
Next, just follow the installation wizard.



When installation has finished there will be a start icon on desktop and in start menu.

2. Overview

This is what ViCANdo looks like when you start up the first time. In the console window the options available for your license key are listed.



The Console window also gives you updates about actions, debug support and explanations to eventual errors.

2.1.1 Project explorer

The project explorer shows the different components included in the project.

2.1.2 Sources

A source can be anything able to acquire data. For example a CAN channel or a Video camera

2.1.3 Presenters

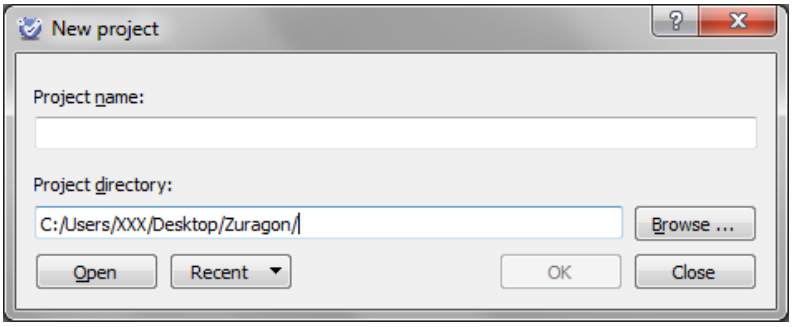
A presenter displays the data acquired from a source. It can be specific to a source, or compatible with many kind of sources. For example a Video presenter can only present data from a Video source. It's possible to setup multiple presenters connected to the same source.

2.1.4 Sessions

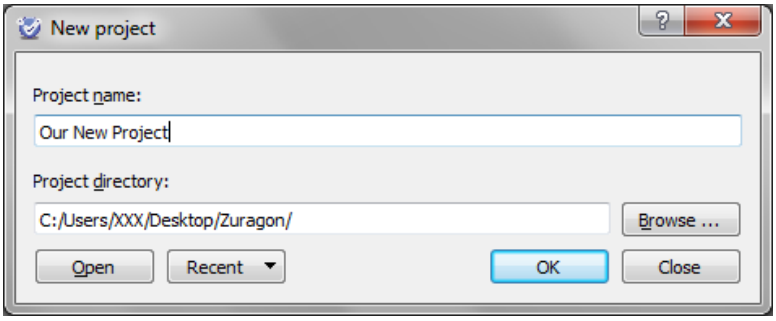
The session folder contains a list of recorded sessions.

2.2 Creating a project

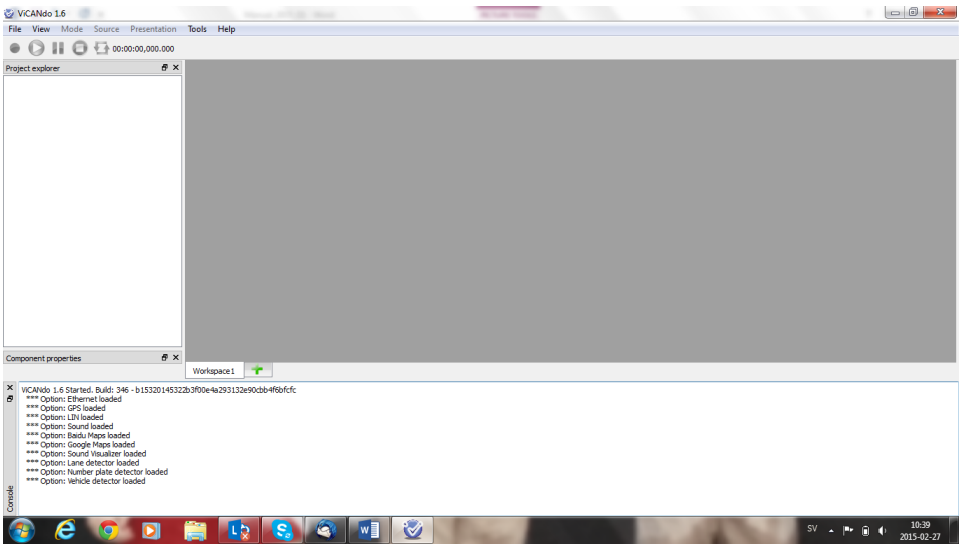
When the ViCANdo application is started the first time it will show the "New project" dialog.



By entering the project name ViCANdo will automatically suggest a project directory. The project directory path, must be a non-existing directory that will be created in conjunction with the new project.



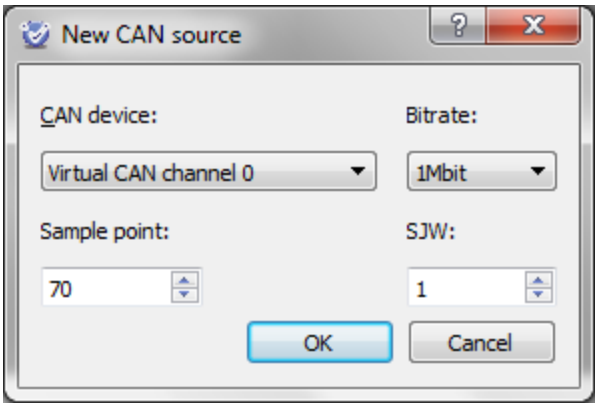
After creating the project the window looks like this.



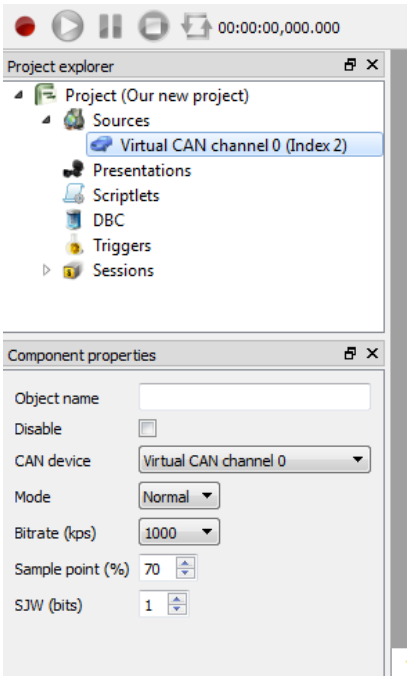
3. Basic functions

3.1 Setting up a CAN channel

From the 'Source' in the menu bar choose 'CAN Source' and the following dialog will show up:



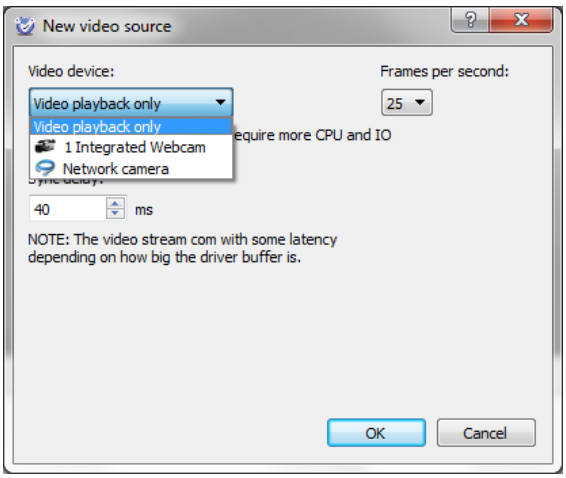
The new CAN channel is now under 'Sources' in the 'Project Explorer', it' also possible to change parameters like bit rate an sampling point from the 'Component properties' dock.



To 'Remove' the CAN channel, right click on the component in the 'Project Explorer' and choose 'Delete' from the context menu.

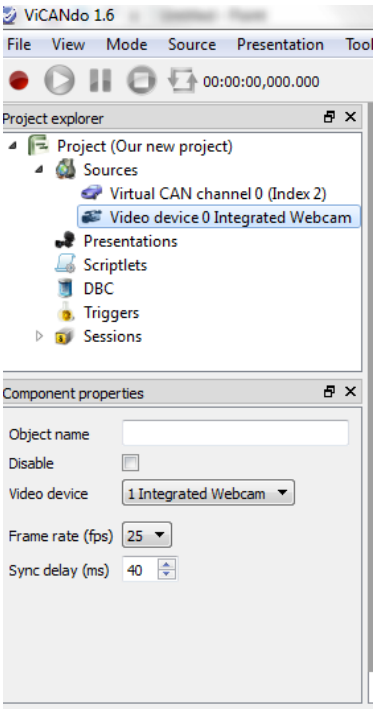
3.2 Setting up a Video channel

From the 'Source' in the menu bar choose 'Video stream' and the following dialog will appear:



NOTE: most USB cameras can do 25 or 30 fps. More advanced cameras can go up to 60 or 100 fps

The new 'Video stream' will show up in the 'Project Explorer'. Properties can be changed from the 'Component properties' dock.



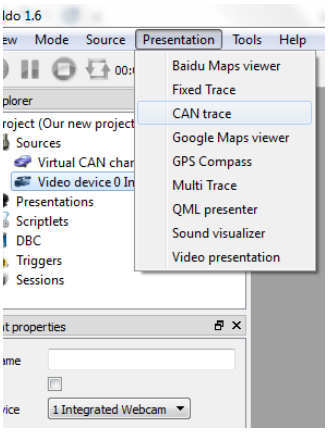
To 'Remove' right click and choose 'Delete' from the context menu.

Note: A USB 2.0 Highspeed port can only have 480Mbit/s of data traffic. If one have a hub on the port, all devices connected must share the 480Mbit/s. The result is that one can only have two 720p cameras on one USB 2.0 Highspeed port. Some computers have internals USB hubs. It might be even if your computer have 4 *external* USB 2.0 ports they are under the same *internal* USB hub.

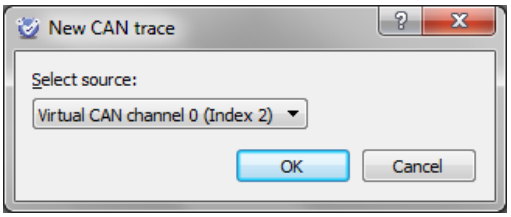
To find out how your USB ports and devices are connected. You can use USBview on Windows and lsusb -t on Linux. On Linux lsusb is usually included from default by the distribution. On Windows you need to download the USBview tool from *http://www.ftdichip.com/Support/Utilities/usbview.zip*

3.3 Setting up a CAN trace

The CAN trace window is a "raw" CAN window with no connection to a database file. So getting it started is quite simple.

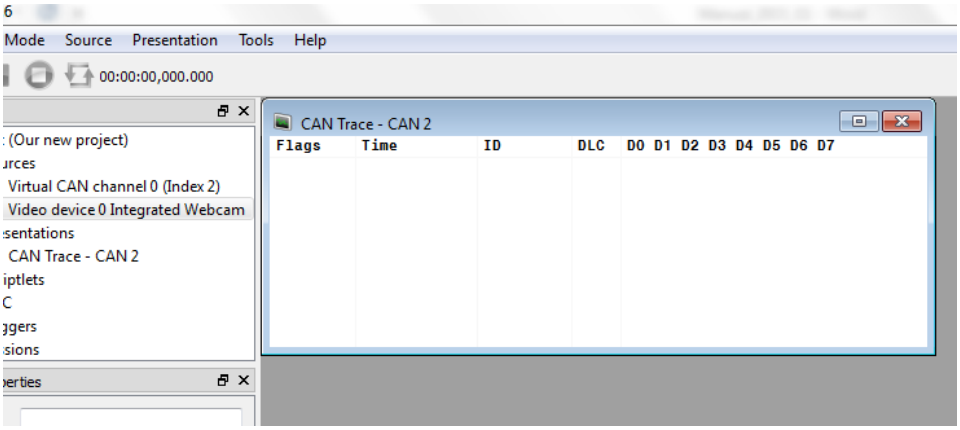


Start of choosing a "CAN trace" from the Presenter menu



Choose 1 CAN source to associate to the presenter

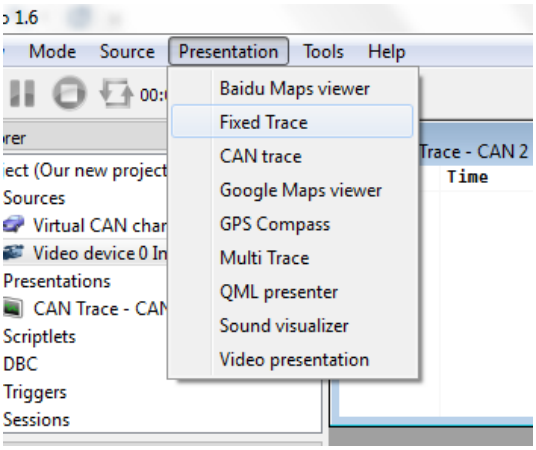
At this stage, the CAN trace Window shows up



We will get back to how it looks when there is traffic in the measurement a little bit later in the manual.

3.4 Setting up a CAN fixed trace

Start choosing a "CAN fixed" from the Presenter menu.

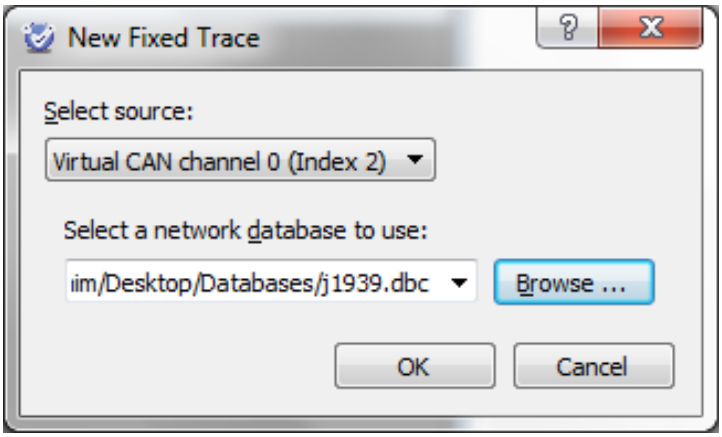


In this case, you also have to add a data base file. Not only the CAN channel.

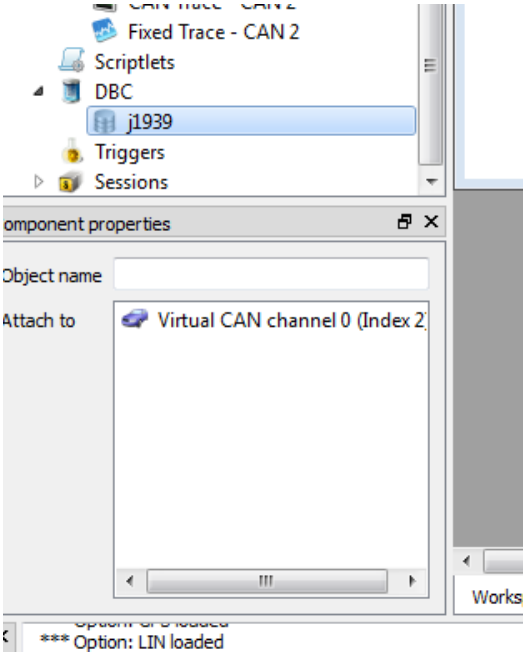
Apply the proper database file. A good practice could be to keep the database file in your ViCANdo project

Folder. That makes it easier to share complete projects in later stages.

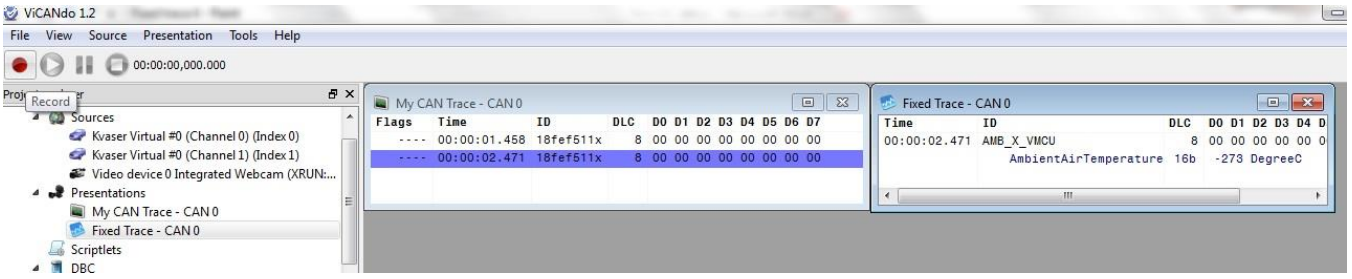
Apply the database and press OK.



In next step don´t forget to associate the database to the proper CAN channel. One dbc can be associated to several CAN channels. The logic is the same, later on in the manual introducing .ldf and Fibex formats.

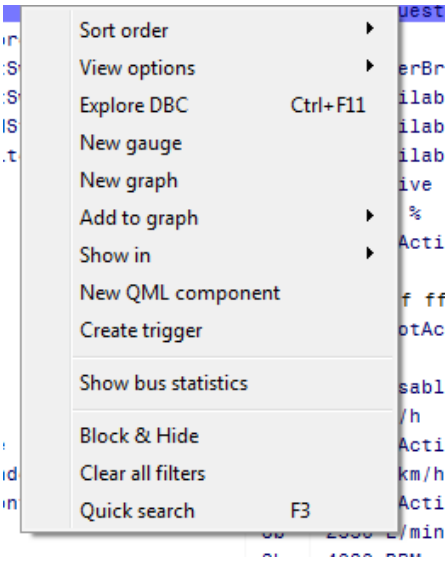


To go live (but not starting any logging activity) click the red "Record" button at the upper left corner



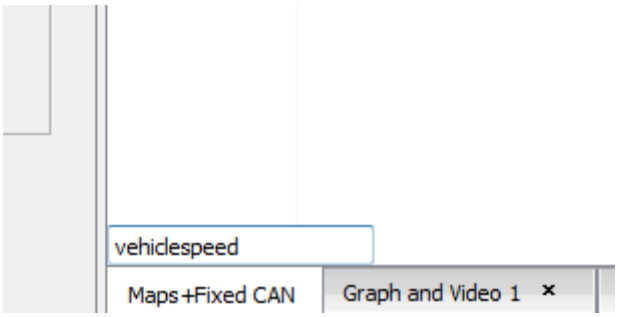
The result shows up immediately.

The fixed trace is a very central function in ViCANdo. By Right Clicking a signal a lot of options show up. In the "Advanced manual" and in our web trainings, you can learn more about the different functions that can be triggered from right clicking on a signal.

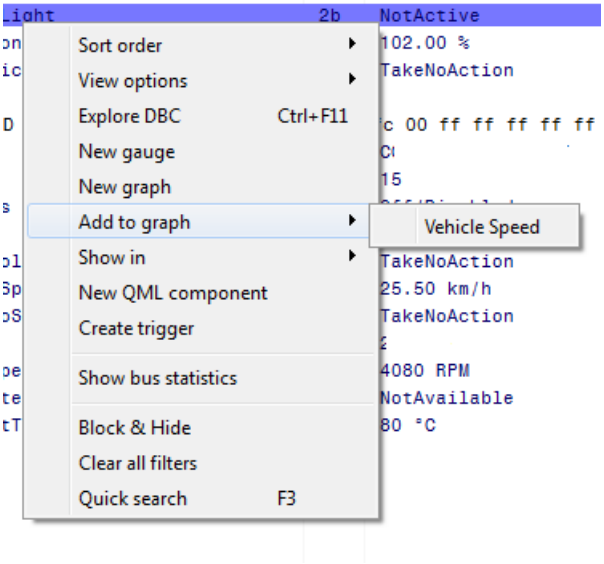


These are the function options for the fixed trace window.

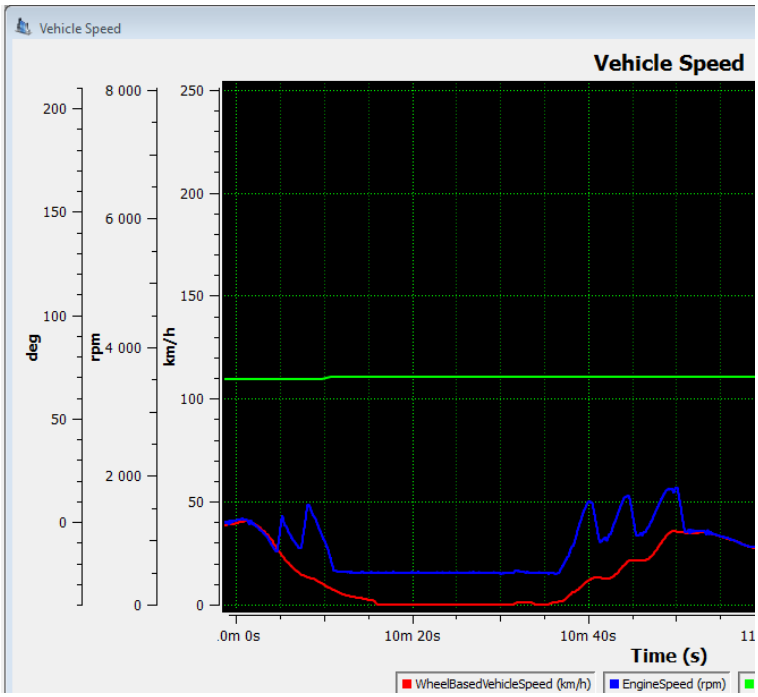
At any time while having the cursor in the fixed trace window, you can by pressing function key F3, open a quick search dialogue in the bottom of the trace window. Type in any signal name and hit F3 again and the next hit in the trace window containing the word will show up.



As an example we add a signal to graph from the "Fixed Trace" window. Right click on the signal and pick "Add to Graph"

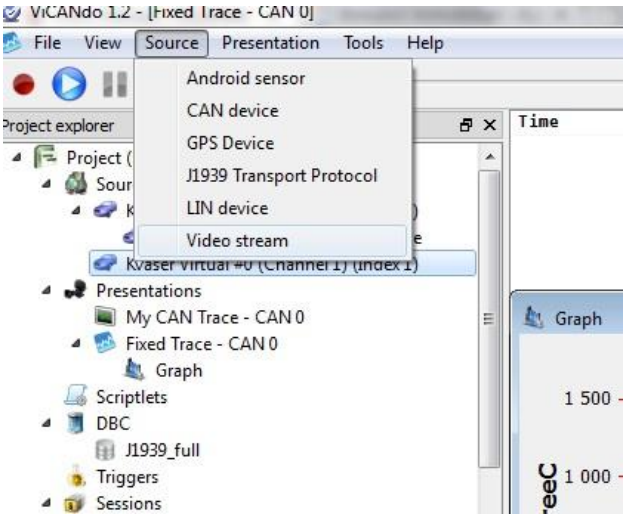


And the signals shows up in the Graph window

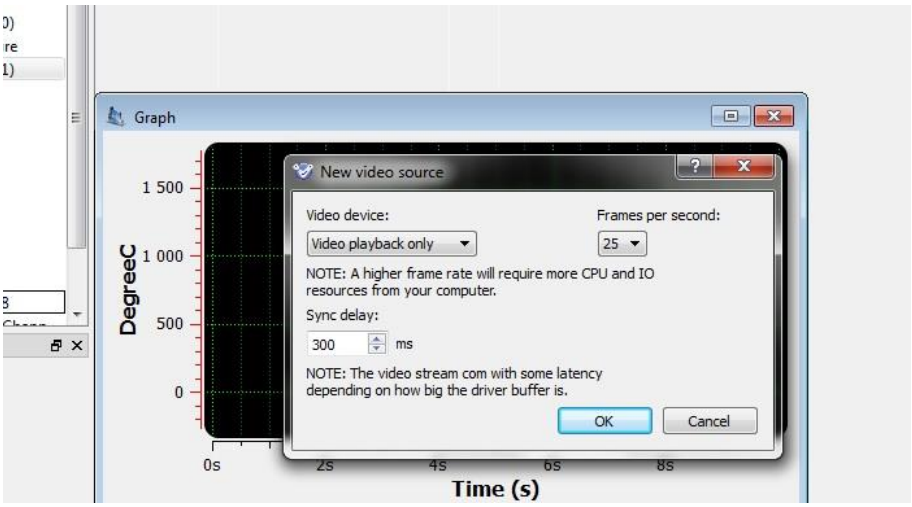


3.5 Setting up a Video presenter

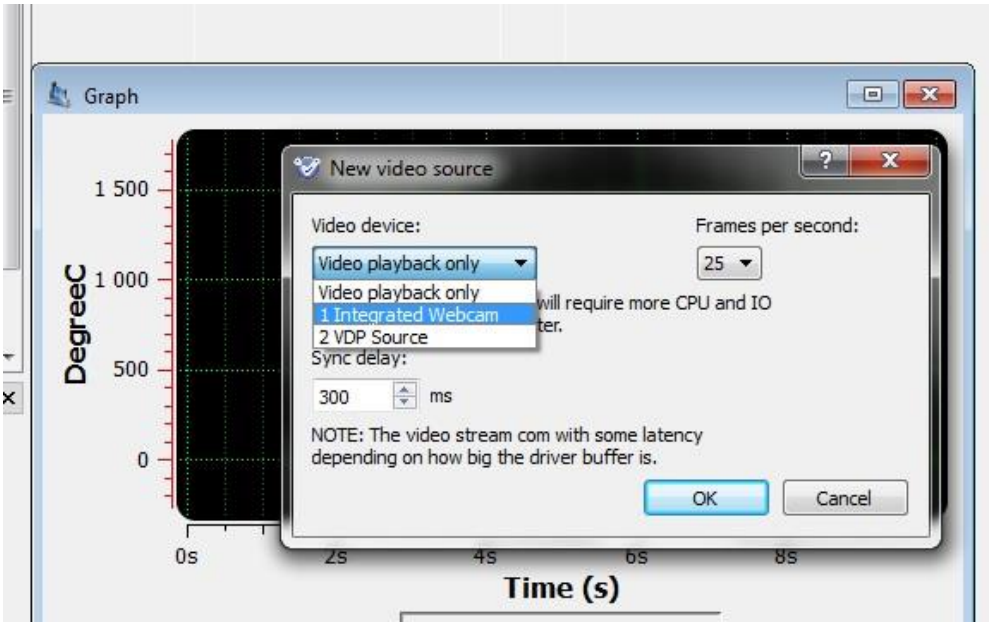
As all sources in ViCANdo you start by picking a source



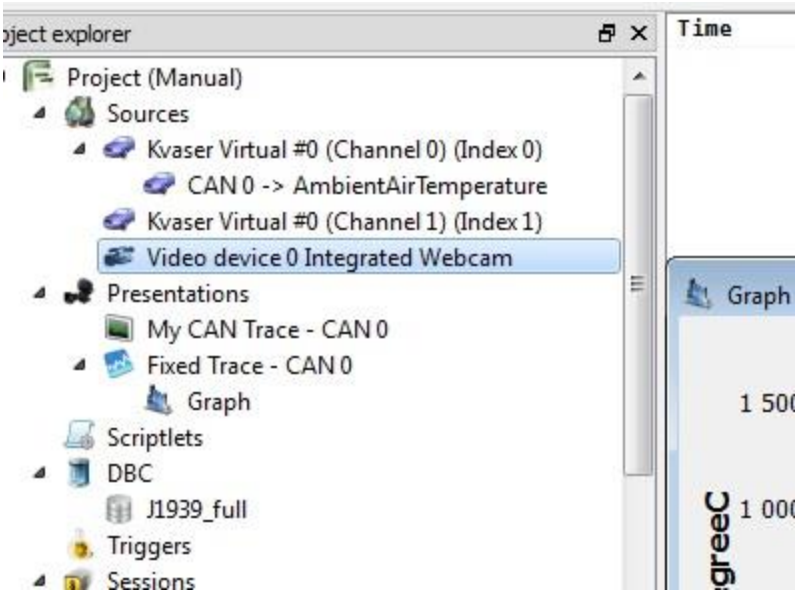
This window shows up. In most cases you don´t have to care about settings. They are normally picked directly from driver of the unit. However, in some cases you would like to adjust the number of frames per second and/or the delay.



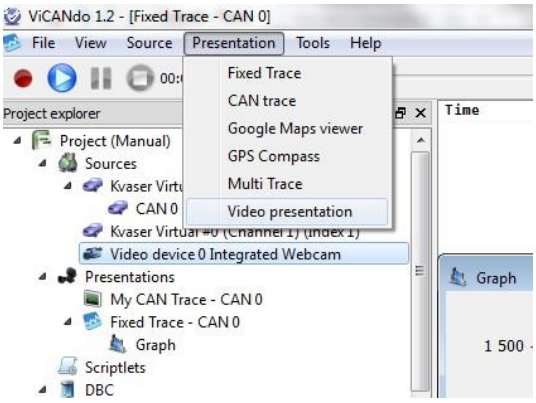
In this case. We use the built in Video Camera or the laptop.



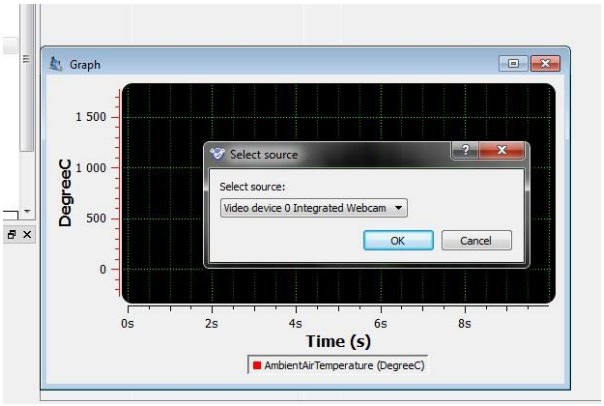
Now we have a Source that shows up in the source panel. This source can be linked to the Video presentation window, but also to i.e. the "Multi trace Window"



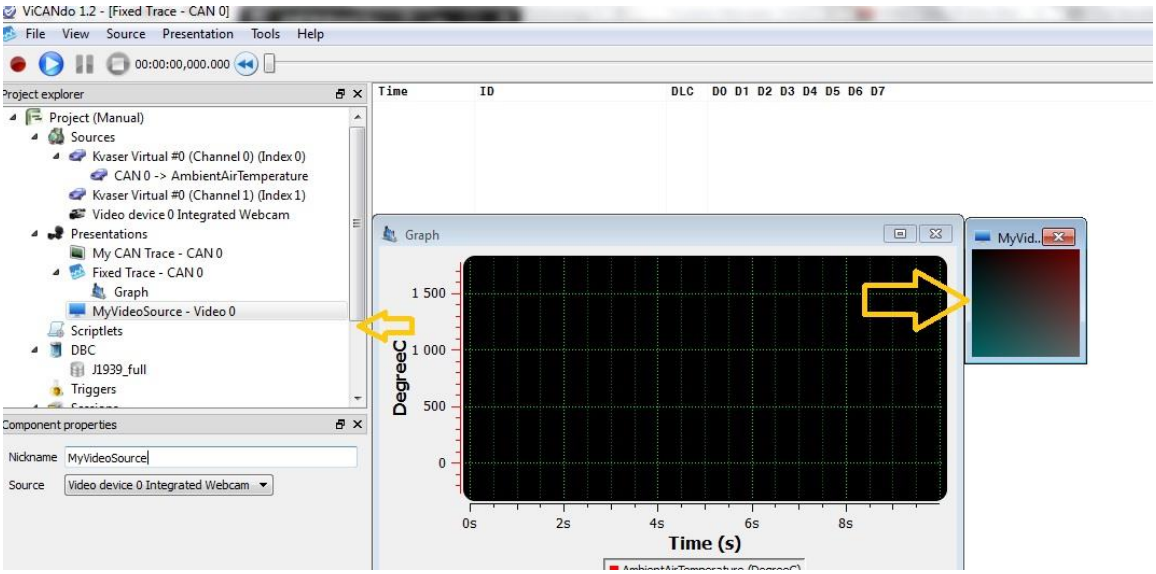
In this case we choose the Video Presentation window.



Assign the source to its presenter. Just as with the CAN (or any source in ViCANdo) sources before



And the Video presenter appears immediately in the measurement.



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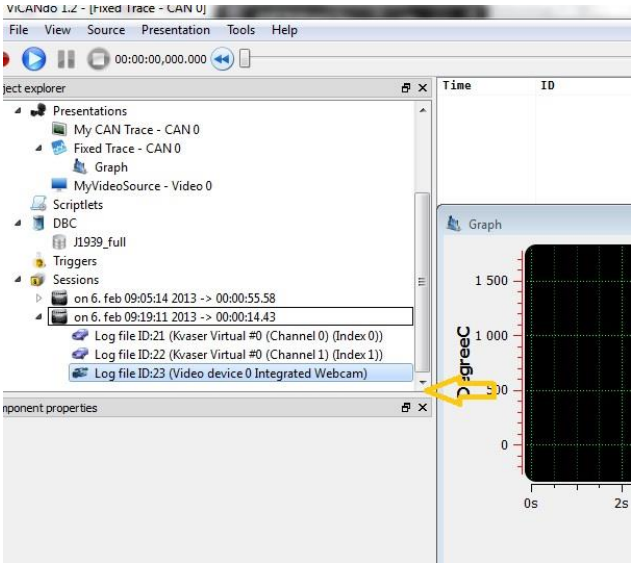
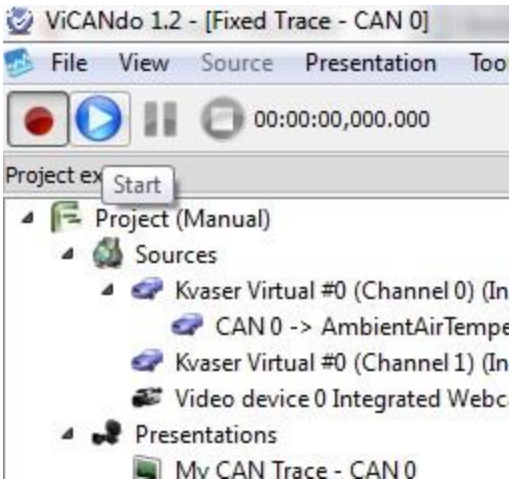
The Video log file is recorded and logged separately from all other sources. So the more cameras you add. The more video log files you will have



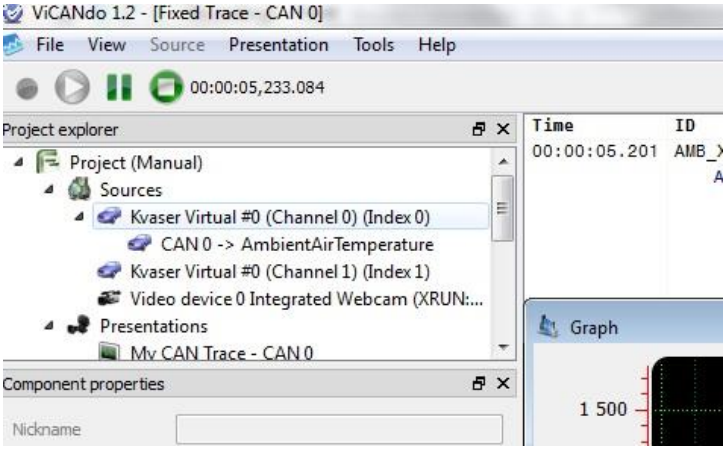
3.6 Recording and Replay

ViCANdo has basically 2 states. By pressing the "Record" button at the upper left corner ViCANdo makes a couple of things:

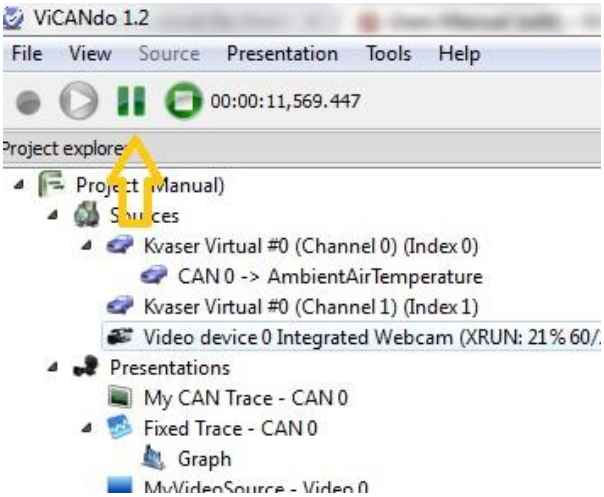
a) It takes control of the timing issues in the measurement and calculates all timing off sets of all the sources in the measurement set up, and b) Displays all active sources in their respective active presenters in real time.



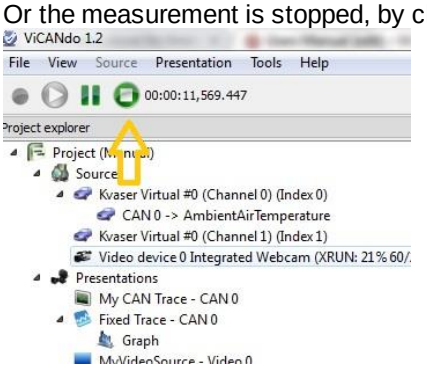
However, nothings is logged, before you click the blue "START" arrow



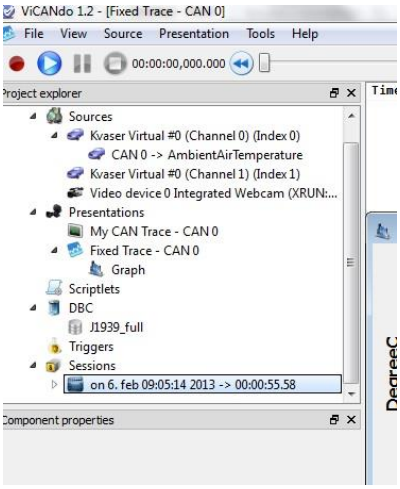
The measurement is paused by clicking the "PAUSE" button



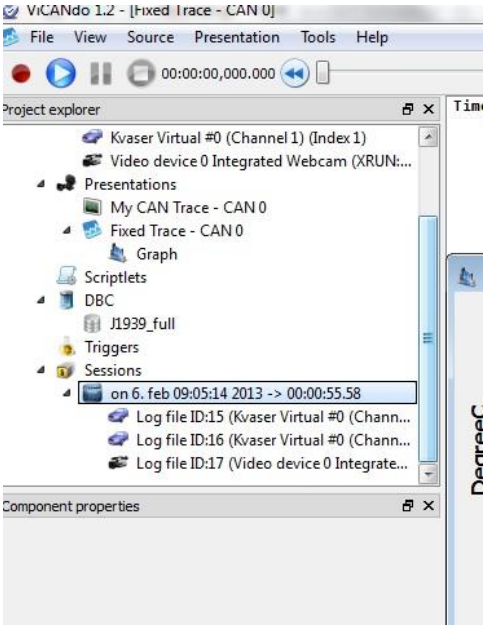
Or the measurement is stopped, by clicking the "STOP" button



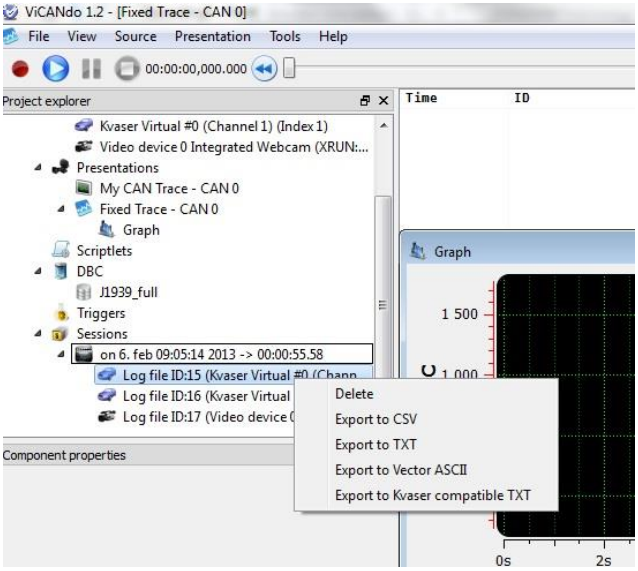
Your first recorded log file show up under "Sessions" in the project tree. The log file is automatically named with the date and time the recording started.



If you explode the "Session" it will show you what sources that have been recorded. They are all kept as separate log files with their own source time stamping. But ViCANdo has put a common time stamp on all of them.

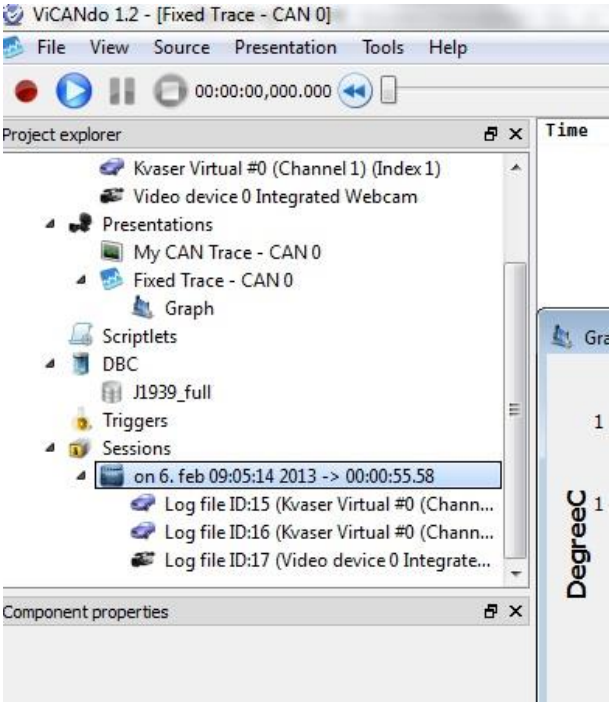


The log files can be exported to accepted standard formats. Hence if you for any reason would like to replay your log file or make post analysis in other tool than ViCANdo, it is possible to achieve.

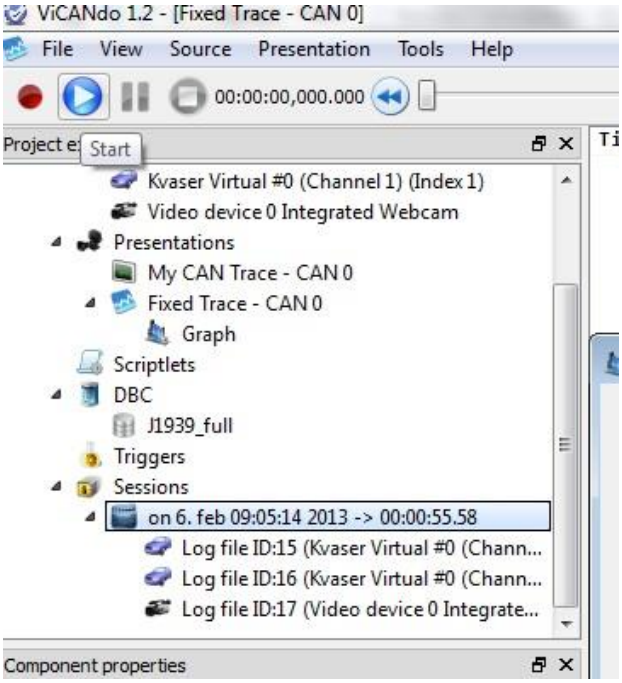


3.7 Replay

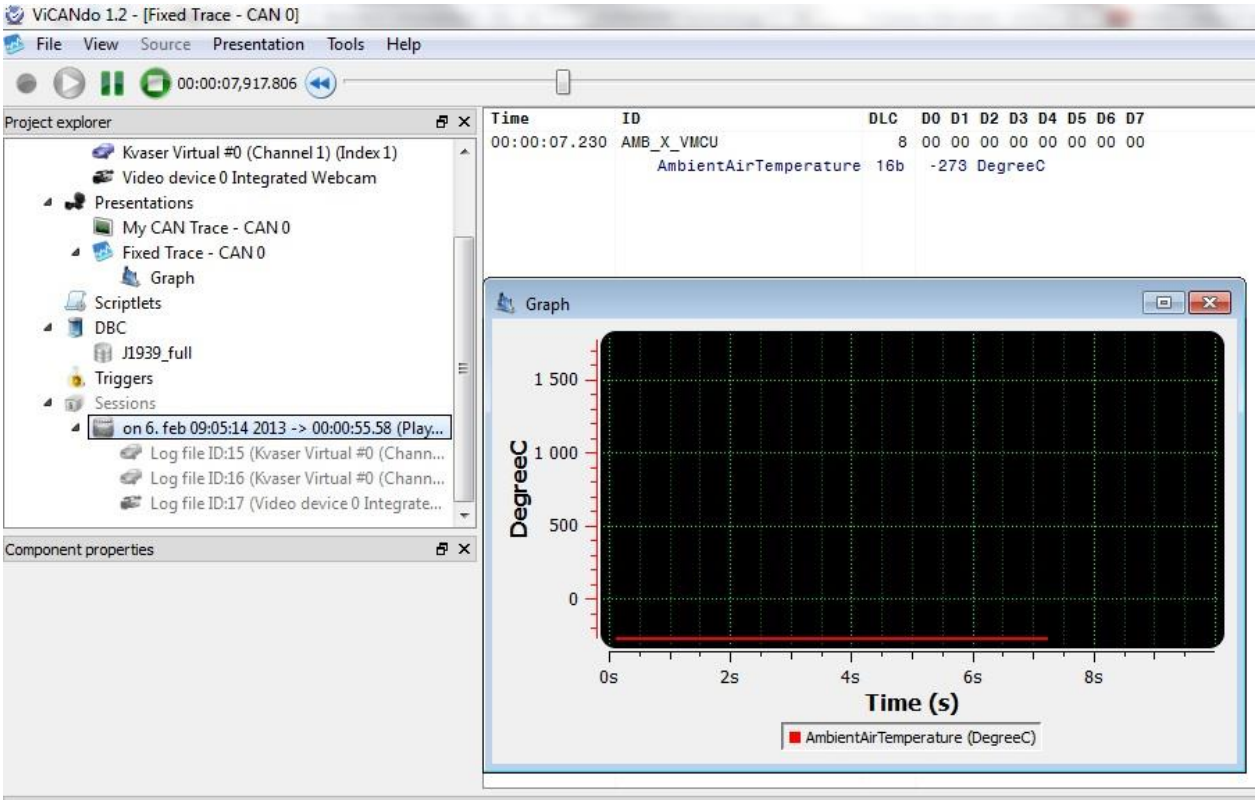
To replay the log file is very simple. Just mark the session you would like to replay



Push the blue "START" button



And the log file, with all its contents is replayed.



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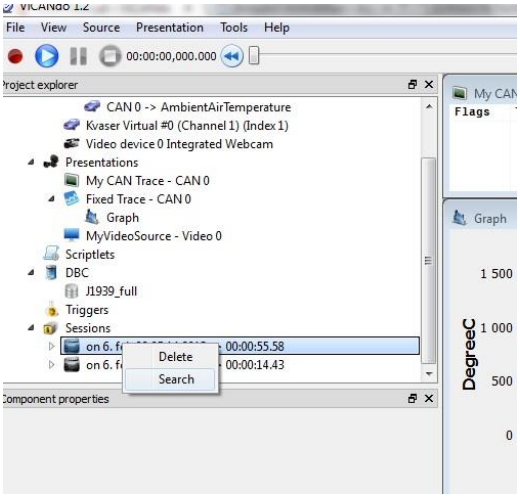
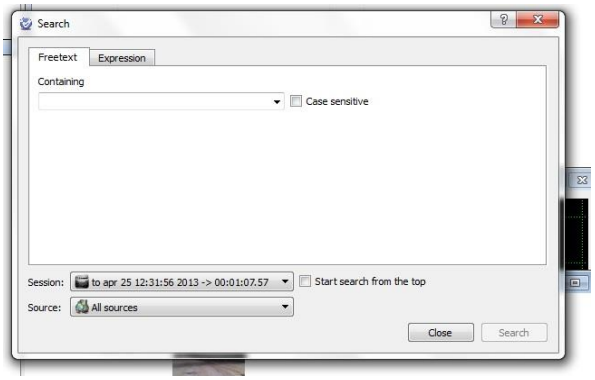
3.8 Sessions and Search in a log file

All logs taken by ViCANdo is saved in a so called "Session". A session consists of all log files taken at a certain moment. In a session, it´s possible to make a free text search. All items in the log file are searchable. No matter what source it comes from.

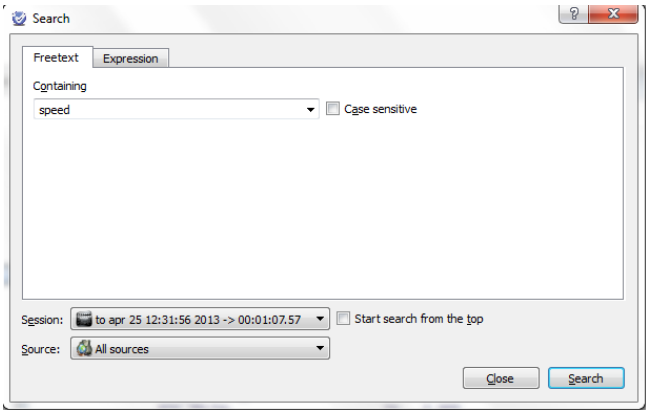
Start by right clicking the session that you would like to search.



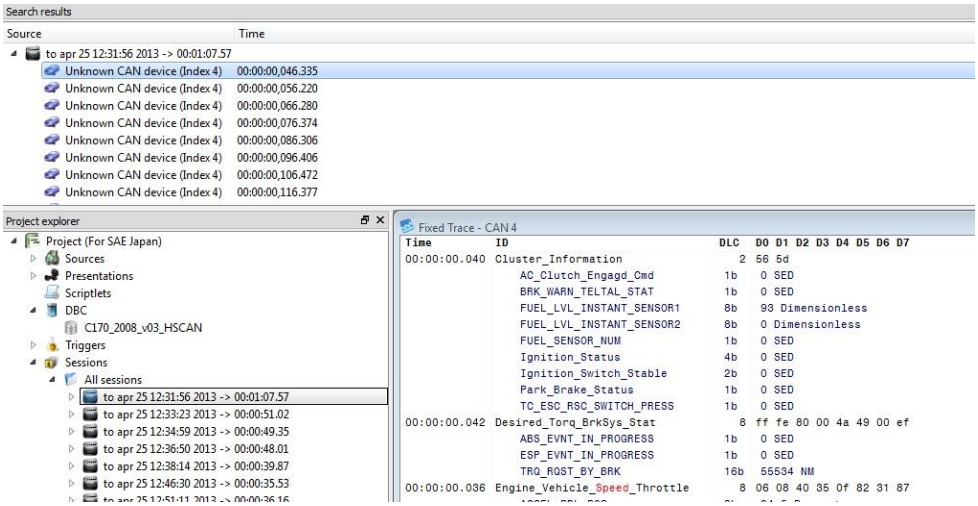
This dialogue will appear



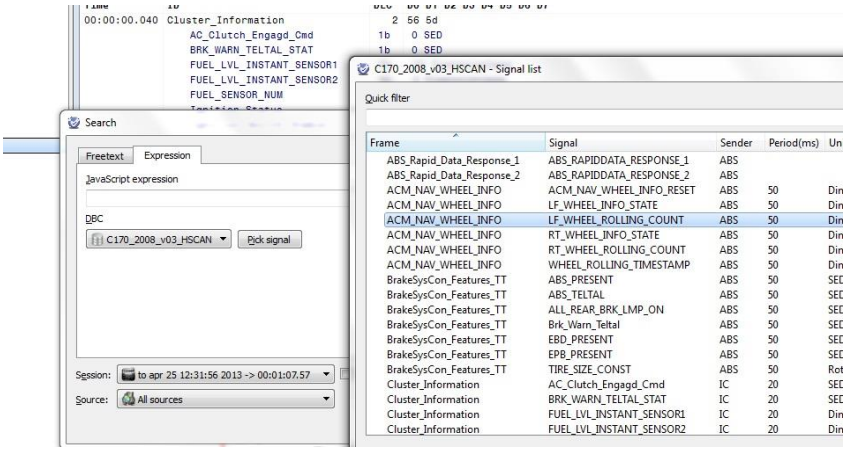
Type in the key word in this case ”speed” and hit the search button.



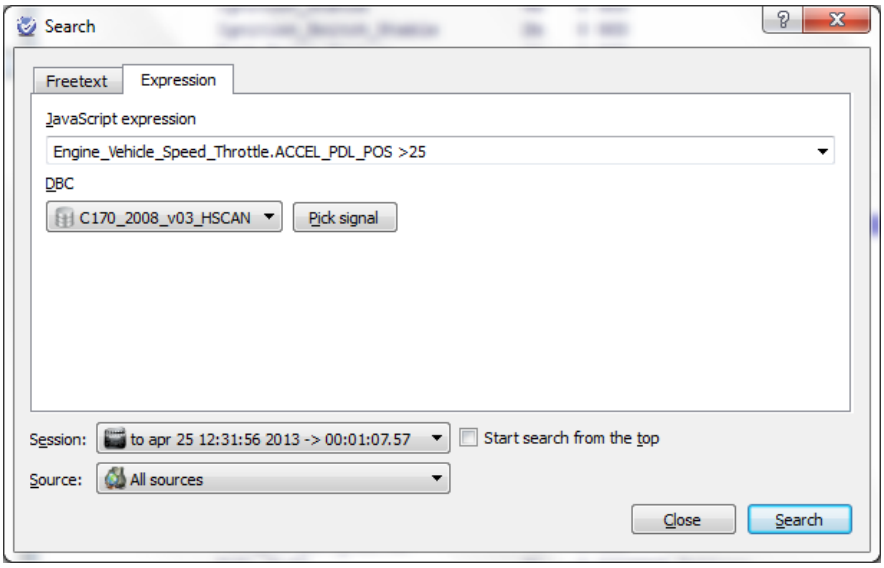
The hits will appear in a new window “Search results” and moving between the hits, the various windows in this case the fixed trace, will high light the hits in red



A more advanced way is to use the expression search tab. By pressing “Pick signal” you can use the database file to search for a specific signal.

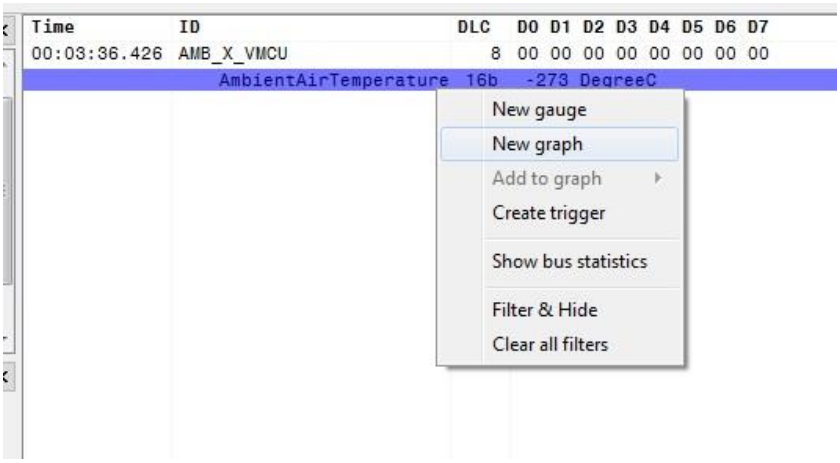


Or you can also create more complex search criteria's using JavaScript logics

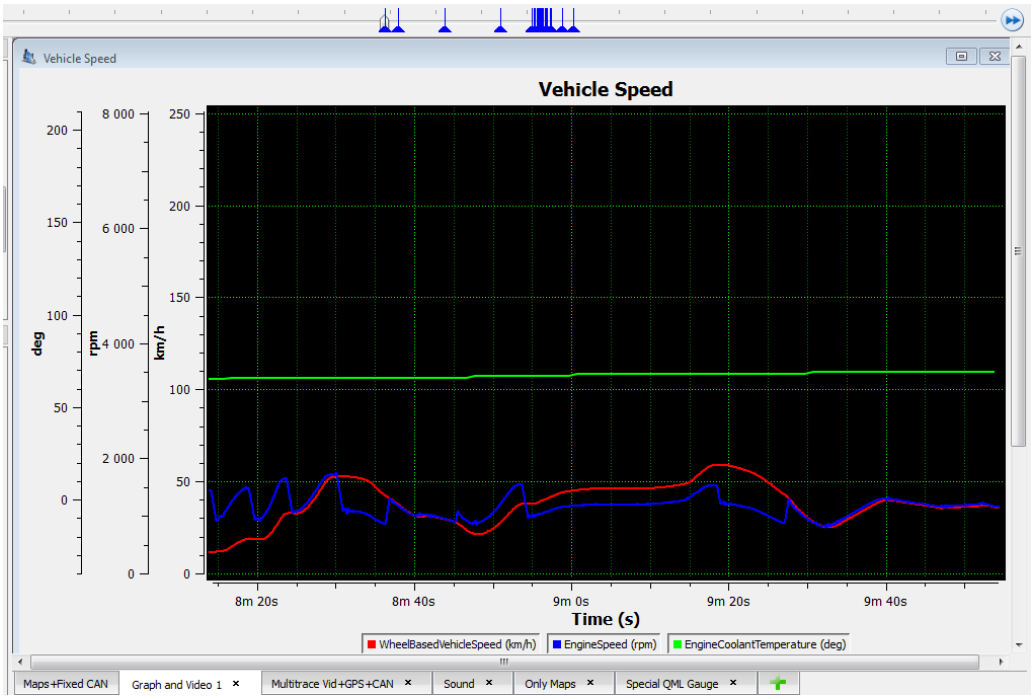


3.9 Graph Window

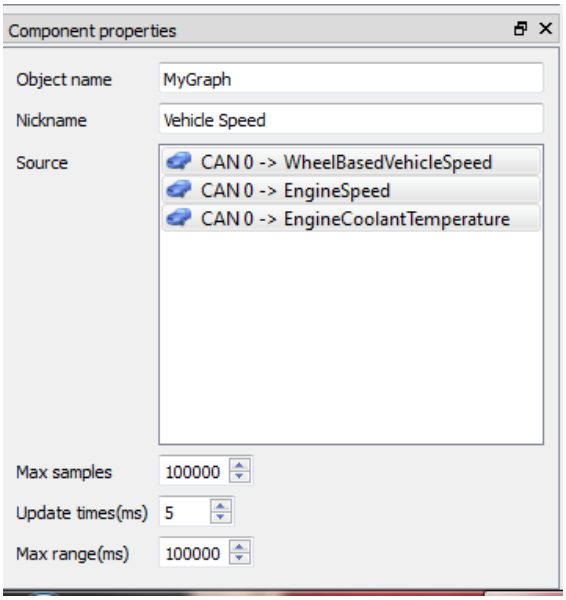
As an example we create a graph from the "Fixed Trace" window. Right click on the signal and pick "New Graph"



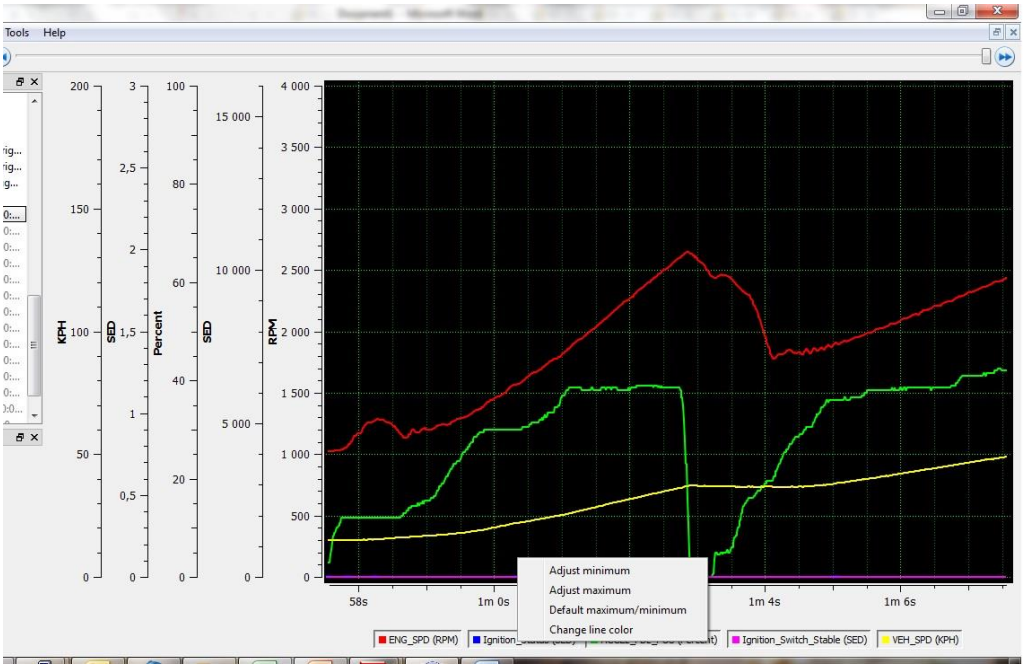
And it shows up immediately.



The properties of the graph window is available under its Component properties tab in the project window.



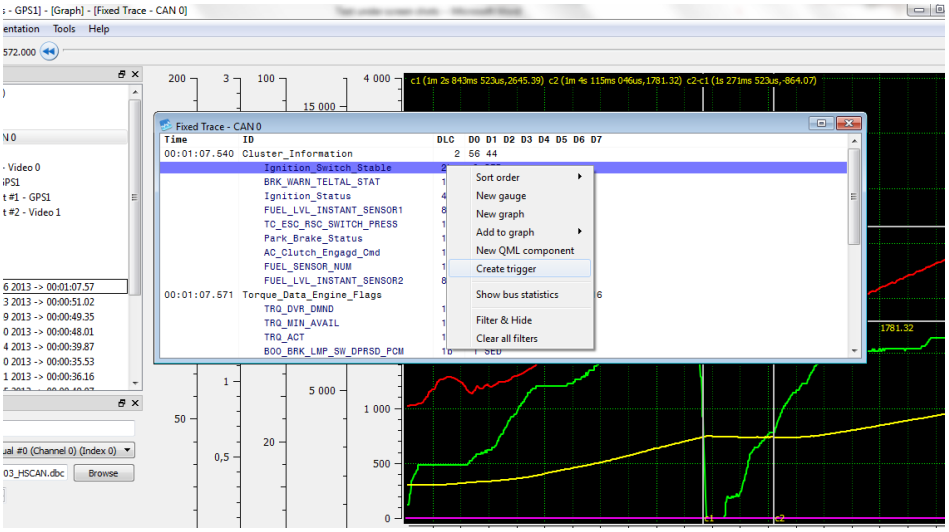
To adjust the scale of the signals displayed or change color of the graph in the graph window, just right click the signal symbol right under the graph window.



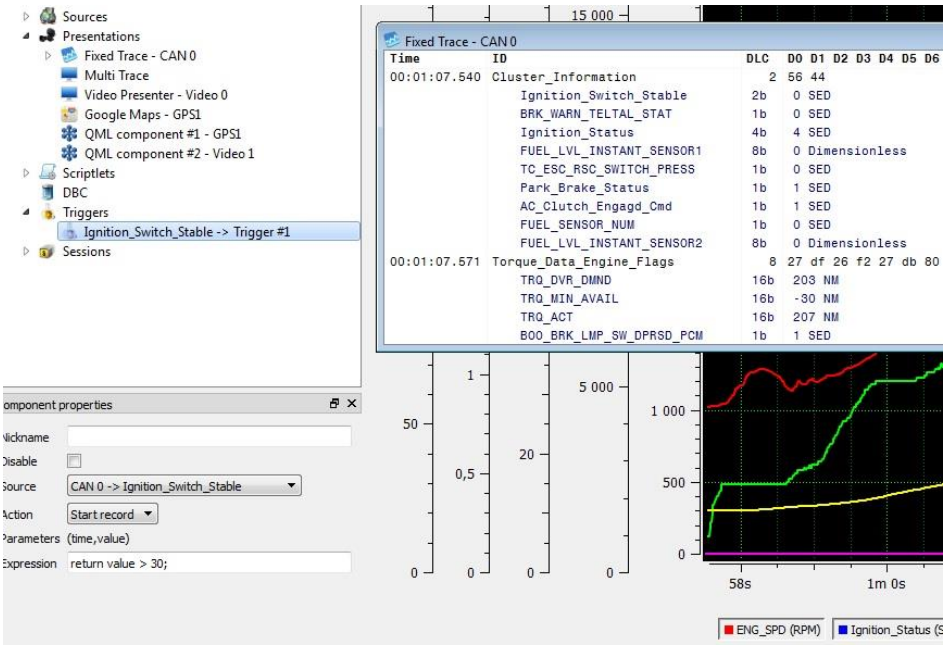
To use the possibility to measure between two points in the graph window, left click on the first point and move the cursor to the 2nd point of the measurement.

3.8 Setting up Triggers

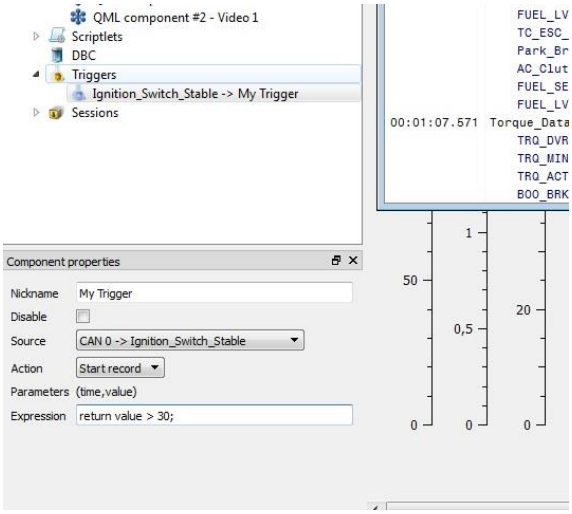
To create a trigger using a CAN signal. Right click the signal in the fixed trace window



After creating the trigger. The trigger shows up in the project tree, and from here you can edit it´s properties.

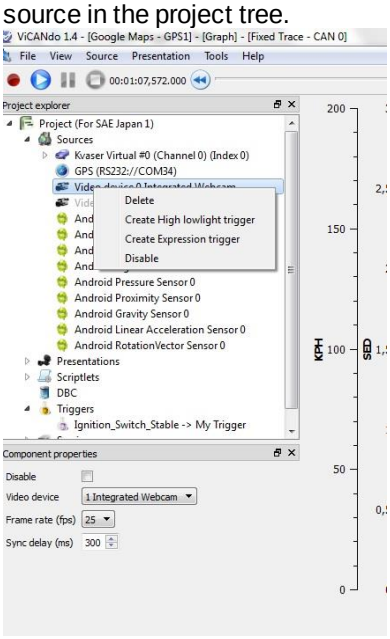


You can adjust your trigger properties in various ways to start or stop a recording based on various parameters. You can also give it its own name. The Example "return value > 30; " means that the trigger will go hot if the CAN signal value exceeds 30 and start the recording.

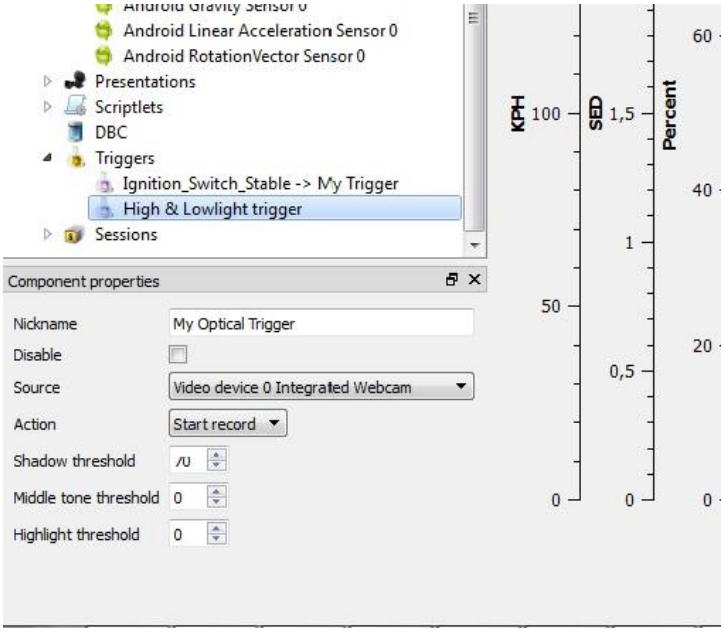


3.10 Optical Triggers

New from version 1.4 is the possibility to use your camera to create triggers. Start of right clicking the source in the project tree.



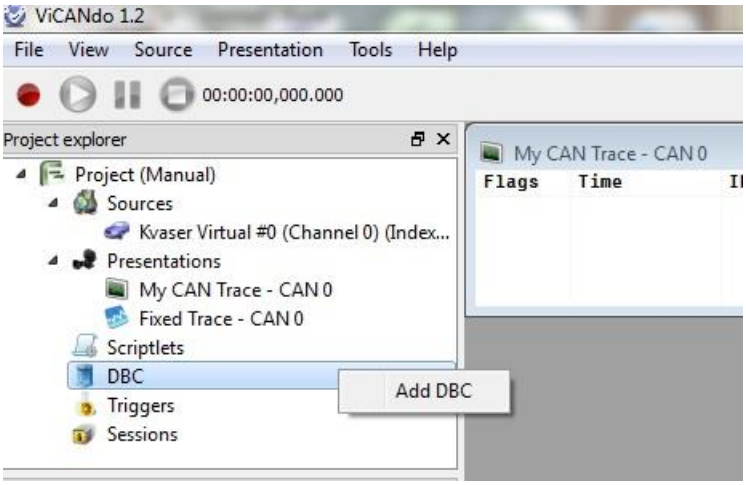
The trigger conditions are set by adjusting the optical conditions where you want the optical trigger to go hot. From light to dark. From dark to light. Spending some time with the settings you can also make it trigger by i.e. a short passage of an object.



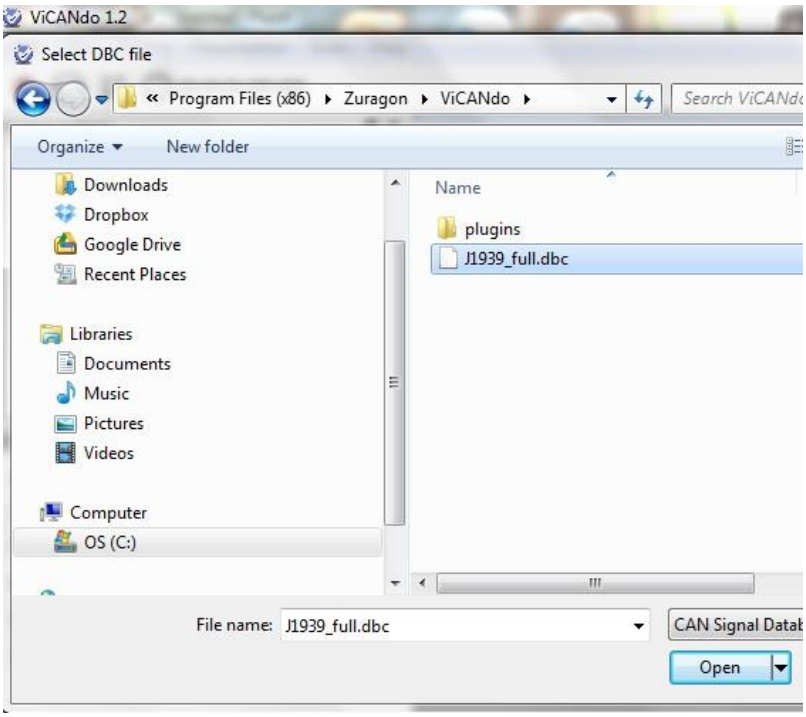
3.11 Traffic Generator

Sometimes it could be useful to generate your own bus traffic. The Traffic Generator is a separate tool under the "Tools" menu. The traffic generator requires that you have a database connected.

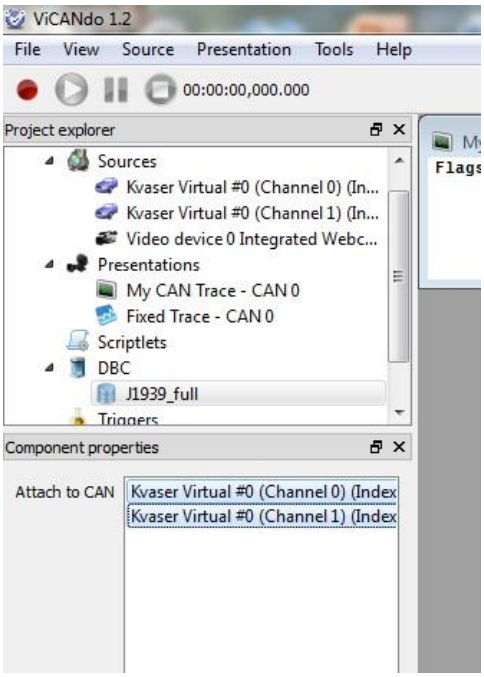
To use this resource you need to associate a database as a global resource, by right clicking the "DBC" item in the project tree.



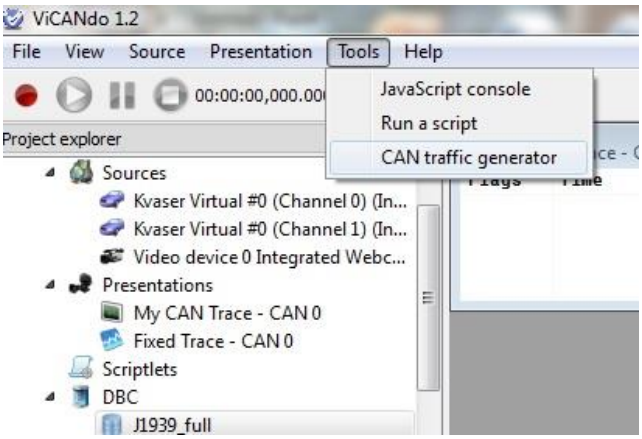
Choose an appropriate data base



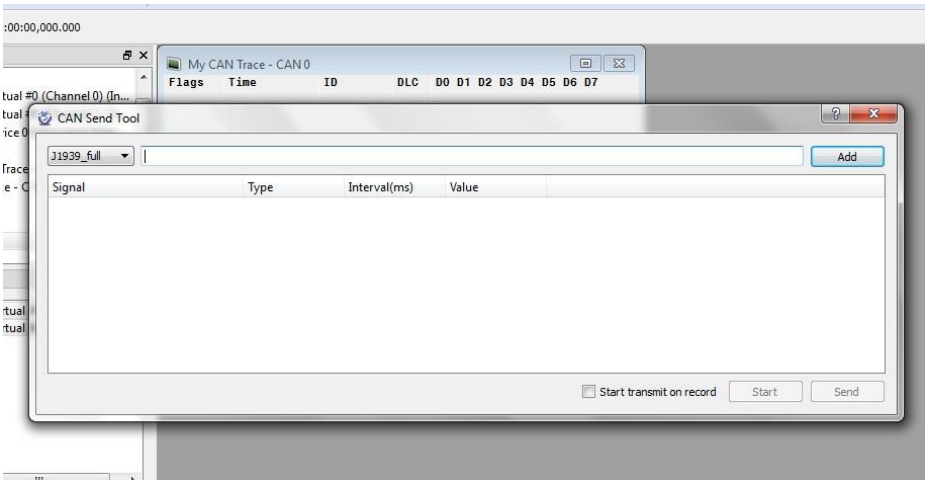
Associate the data base to the CAN channels where you would like to be able to send.



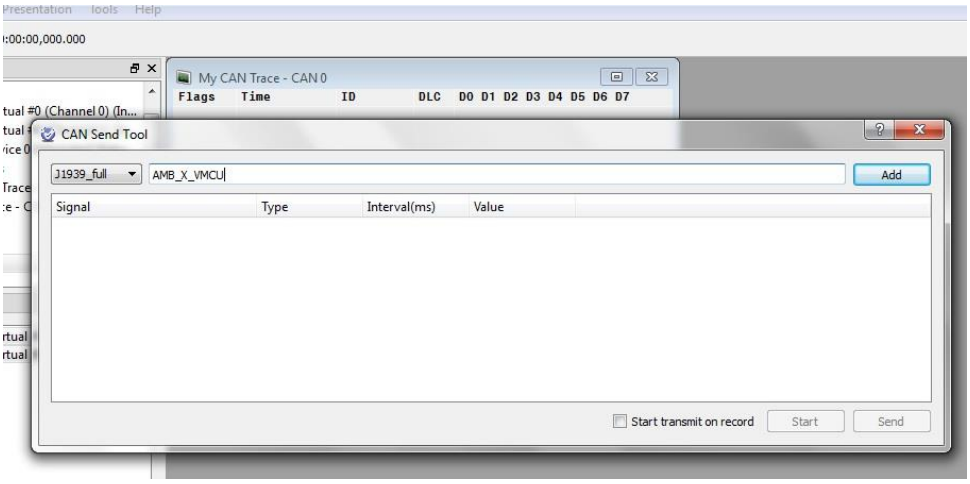
Pick the "CAN Traffic generator" from the tools menu (Ctrl+F12)



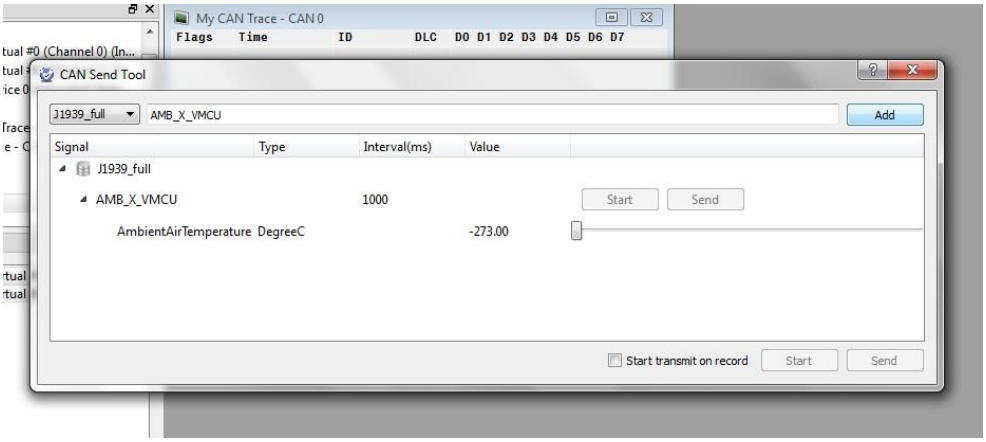
This dialog will appear



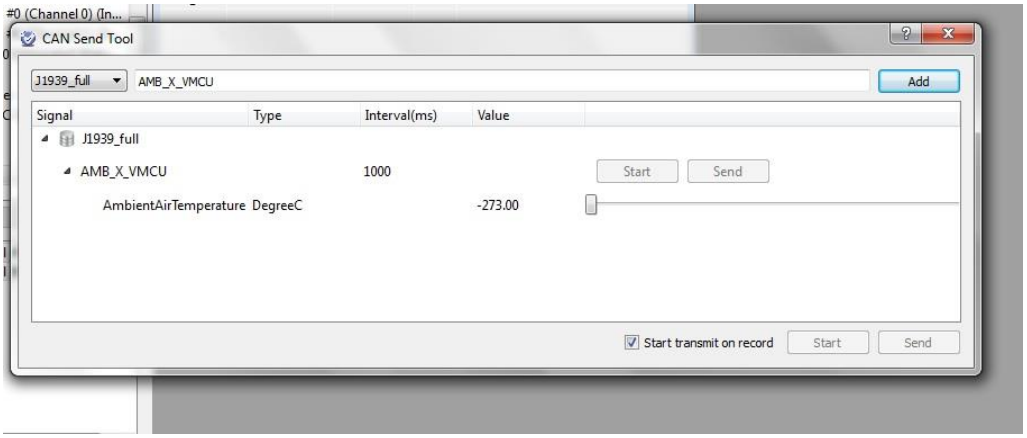
Type in the name of the message that you would like to send. The dialog is searching the data base and proposing messages as you type. Most of the times 1-2 letters is enough.



The signals in the message with their attributes will show up in the dialog. The slider is there to make a manual change to a signal value. But absolute values could also be typed in by using the key board.



For ease of use, you can click the box, "Start transmit on record". This will make the traffic start as soon as you click the red ”Record” button.

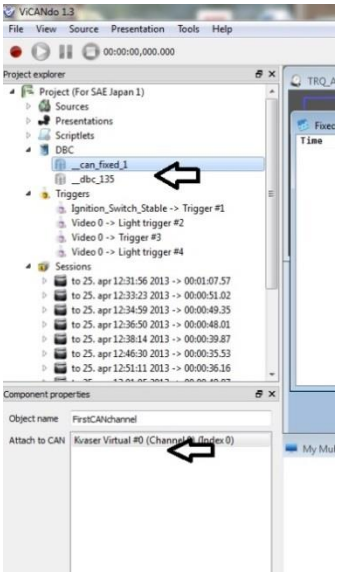


Now you are ready to go.

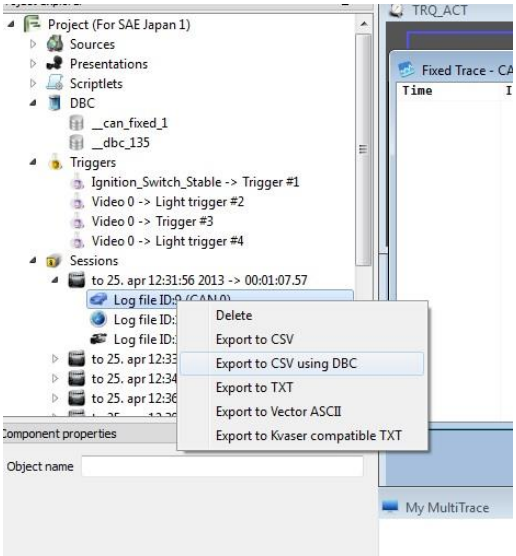
3.12 Export of log files with .dbc support

It could sometimes be valuable to make an export of the log file with support of the .dbc. This gives a possibility to follow one can signal through the whole measurement with its real name and value in engineering units.

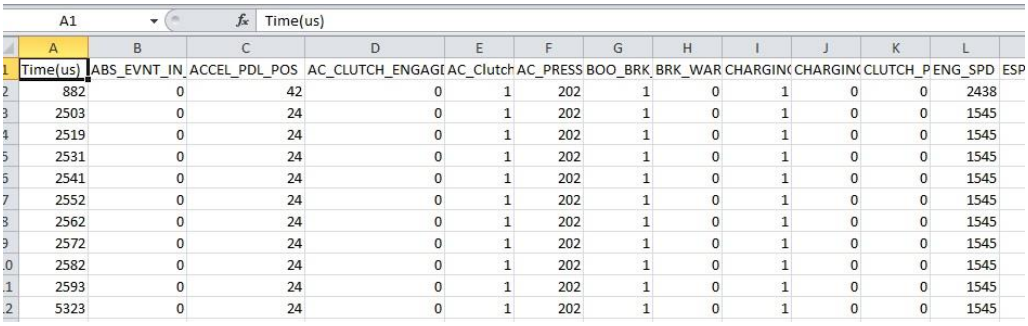
As a first step, before making the export. Make sure that you have the proper database associated on a project level. And also make sure that the database has been associated with the proper source. In this case a CAN channel.



As a next step you choose right click on the log file to export and give the export result a name



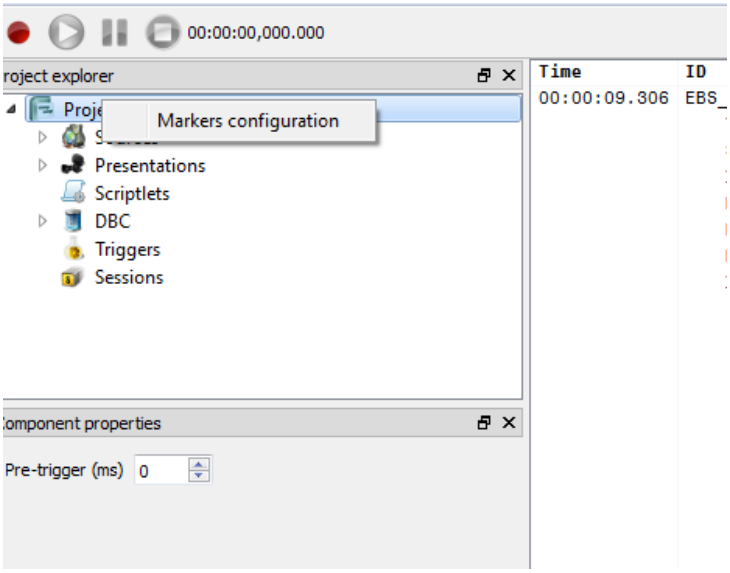
As a default, excel opens and the result is displayed in the excel sheet as columns in alphabetical order: Where the signal name is on top and the data in engineering units are displayed in order of the time stamping



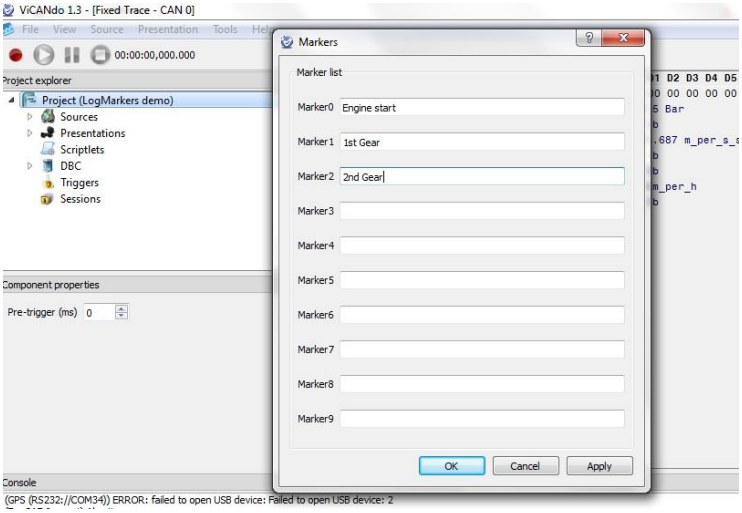
	A	B	C	D	E	F	G	H	I	J	K	L	
1	Time(us)	ABS_EVNT_IN	ACCEL_PDL_POS	AC_CLUTCH_ENGAGI	AC_Clutch	AC_PRESS	BOO_BRK	BRK_WAR	CHARGIN(	CHARGIN(	CLUTCH_P	ENG_SPD	ESP
2	882	0	42	0	1	202	1	0	1	0	0	2438	
3	2503	0	24	0	1	202	1	0	1	0	0	1545	
4	2519	0	24	0	1	202	1	0	1	0	0	1545	
5	2531	0	24	0	1	202	1	0	1	0	0	1545	
6	2541	0	24	0	1	202	1	0	1	0	0	1545	
7	2552	0	24	0	1	202	1	0	1	0	0	1545	
8	2562	0	24	0	1	202	1	0	1	0	0	1545	
9	2572	0	24	0	1	202	1	0	1	0	0	1545	
10	2582	0	24	0	1	202	1	0	1	0	0	1545	
11	2593	0	24	0	1	202	1	0	1	0	0	1545	
12	5323	0	24	0	1	202	1	0	1	0	0	1545	

3.13 Log markers

Some times it is useful to set a log marker in the log file to be able to trace back to a certain event in the log file. To create a log marker start by right clicking the “Project” icon:

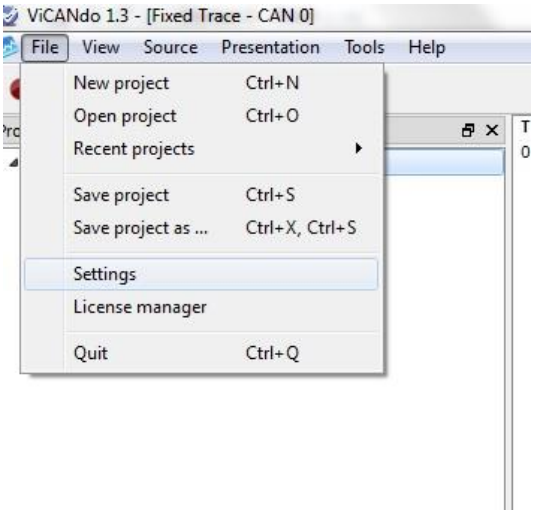


Then this dialogue shows up:

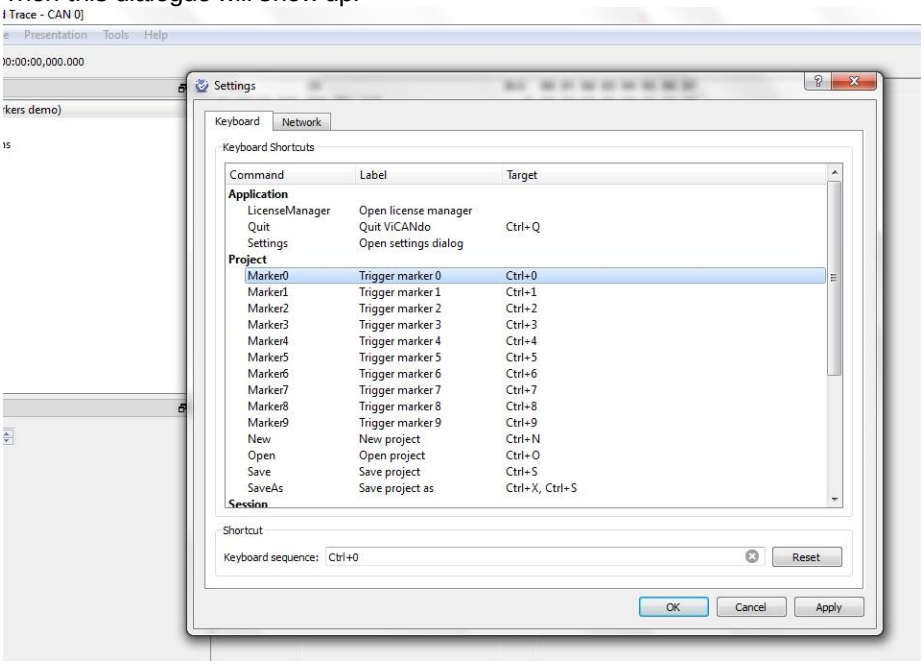


In this dialogue you can name your markers with an even that use a language you are used to. I.e. Engine Start to indicate that the engine is started at this place of the log file. 1st gear, 2nd gear and so forth.

When you have named your markers move on to the settings menu to connect them to a key on the key board by opening settings.

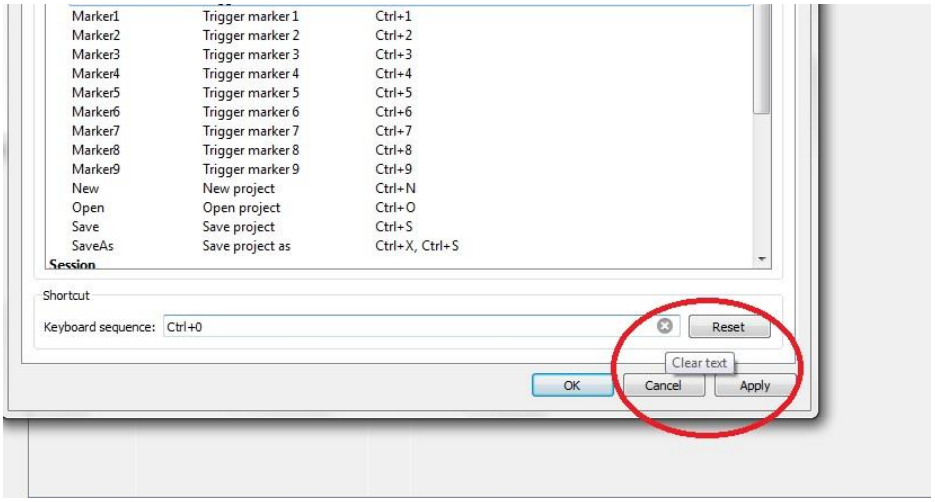


Then this dialogue will show up:

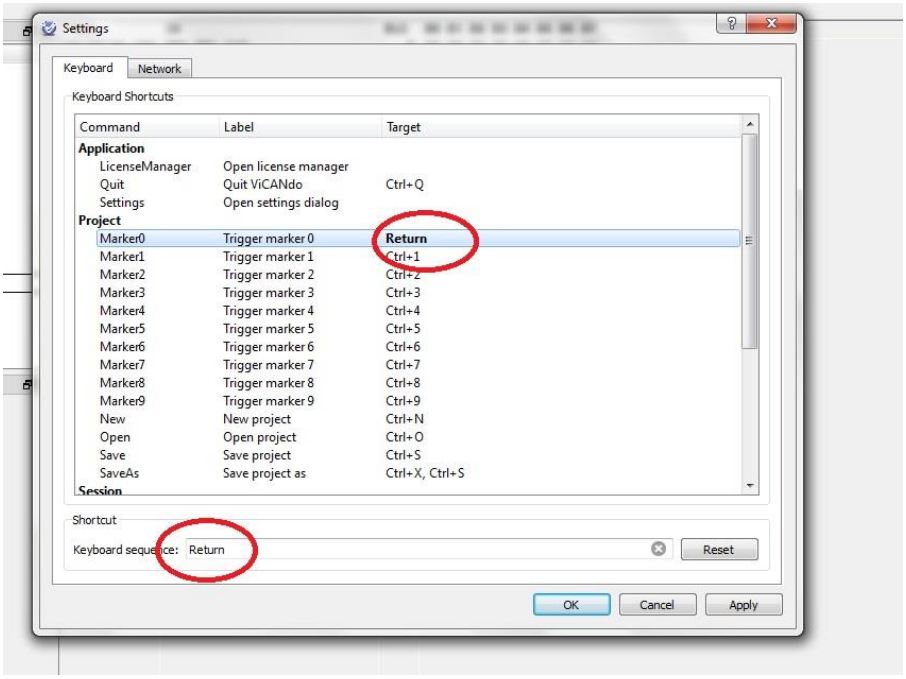


Default, the markers are tied to CTRL+ a digit. But that can be changed.

By pushing the clear text button, you can clear the space and put in any key to be your you log marker activation key

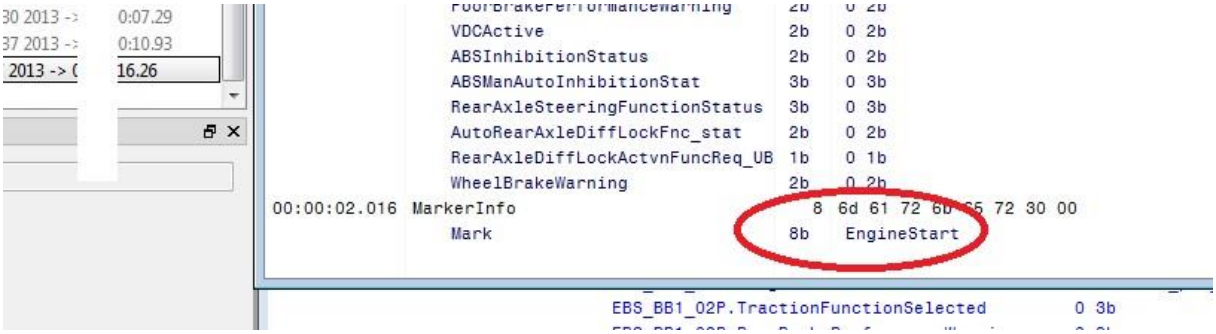


Such as i.e. the return button



The new log marker activation key is activated simply by pushing the desired key. When being content with the configuration of the keys. Press “Apply” and they will be active right away.

During run time when a log is active and the log marker key is hit, the log marker will show up in the fixed trace window.



In the log file the marker will show up depending on the export format. In the csv format It will look like this

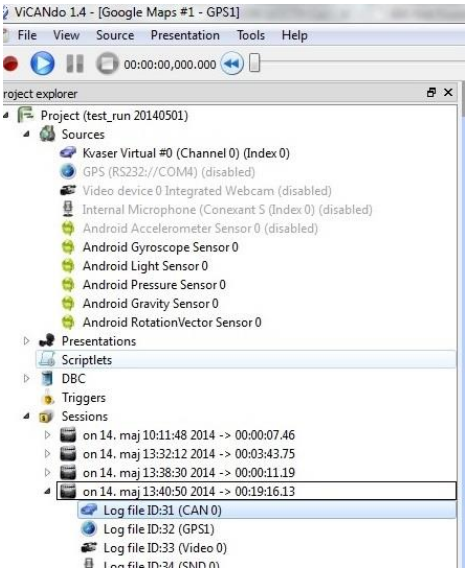
116	3565570	4493000	4	3,52E+08	8	0	0	0	0	0	0	0	0	
117	3565629	4492930	68	3,52E+08	8	0	0	0	0	0	0	0	0	
118	3629088	4556430	4	3,52E+08	8	0	0	0	0	0	0	0	0	
119	3629169	4556320	68	3,52E+08	8	0	0	0	0	0	0	0	0	
120	3690529	4617960	4	3,52E+08	8	0	0	0	0	0	0	0	0	
121	3690585	4617890	68	3,52E+08	8	0	0	0	0	0	0	0	0	
122	3752389	4679790	68	3,52E+08	8	0	0	0	0	0	0	0	0	
123	3752455	4679870	4	3,52E+08	8	0	0	0	0	0	0	0	0	
124	3815749	4743170	4	3,52E+08	8	0	0	0	0	0	0	0	0	
125	3815979	4746291	65536	-1,1E+09										*** Enginestart ***
126	3816001	4743090	68	3,52E+08	8	0	0	0	0	0	0	0	0	
127	3878426	4805830	4	3,52E+08	8	0	0	0	0	0	0	0	0	
128	3878480	4805760	68	3,52E+08	8	0	0	0	0	0	0	0	0	
129	3941429	4868860	4	3,52E+08	8	0	0	0	0	0	0	0	0	
130	3941484	4868790	68	3,52E+08	8	0	0	0	0	0	0	0	0	
131	4003391	4930810	4	3,52E+08	8	0	0	0	0	0	0	0	0	
132	4003451	4930740	68	3,52E+08	8	0	0	0	0	0	0	0	0	
133	4064568	4991970	4	3,52E+08	8	0	0	0	0	0	0	0	0	
134	4064613	4991900	68	3,52E+08	8	0	0	0	0	0	0	0	0	
135	4126411	5053830	4	3,52E+08	8	0	0	0	0	0	0	0	0	

And in the various .txt and .asc formats it will show up with its own time stamp like this:

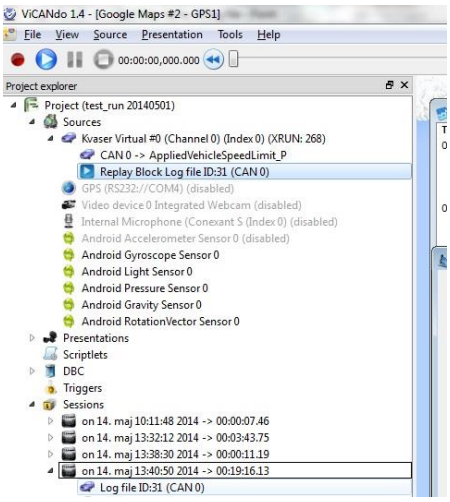
```
3.190413 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
3.253361 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
3.253415 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
3.316555 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
3.316597 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
3.380095 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
3.380171 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
3.443428 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
3.443478 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
3.502495 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
3.502548 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
3.565570 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
3.565629 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
3.629088 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
3.629169 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
3.690529 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
3.690585 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
3.752389 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
3.752455 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
3.815749 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
3.815979 1 Marker       *** Enginestart ***
3.816001 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
3.878426 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
3.878480 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
3.941429 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
3.941484 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
4.003391 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
4.003451 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
4.064568 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
4.064613 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
4.126411 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
4.126617 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
4.191567 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
4.191622 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
4.254708 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
4.254774 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
4.313570 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
4.313622 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
4.379665 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
4.379717 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
4.438695 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
4.438748 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
4.501588 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
4.502004 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
4.565519 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
4.565573 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
4.627571 1 14ff2a0bx       Rx   d 8 00 00 00 00 00 00 00 00
4.627655 1 14ff2a0bx       Tx   d 8 00 00 00 00 00 00 00 00
```

3.14 Replay of CAN log files

To replay a CAN log file you have to put the mouse pointer on the appropriate *Log File* under the right *Session*.

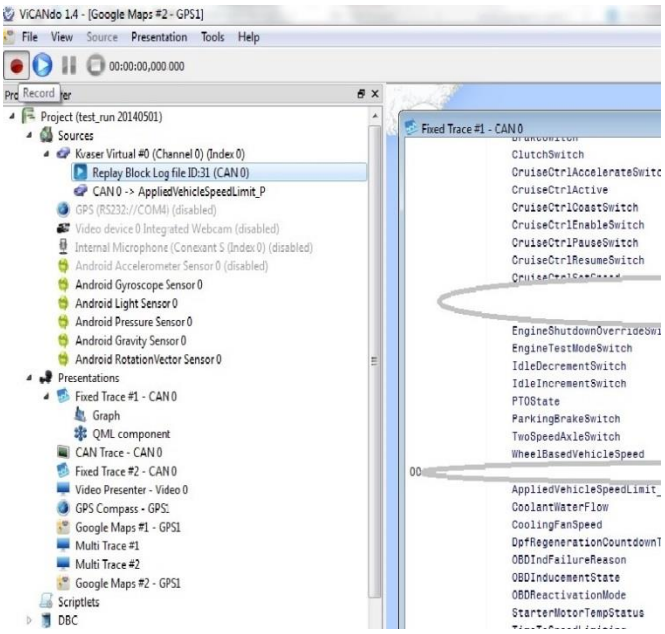


Then just drag and drop the CAN log file to the appropriate CAN source.

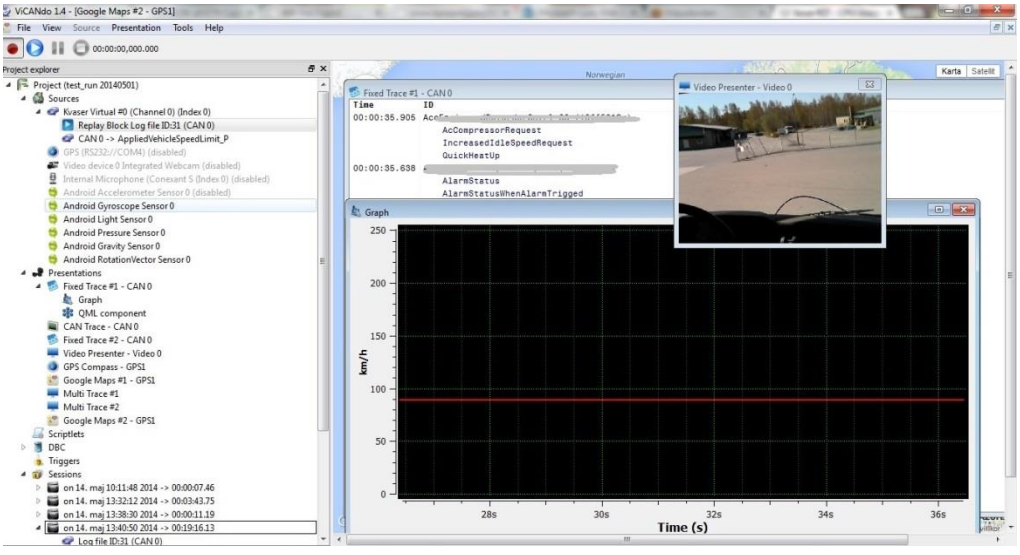


Make sure that you are off line before replaying the log file the first time. You can replay the log file using the ordinary options under the can source. Going live on a CAN bus with a log file can be dangerous.

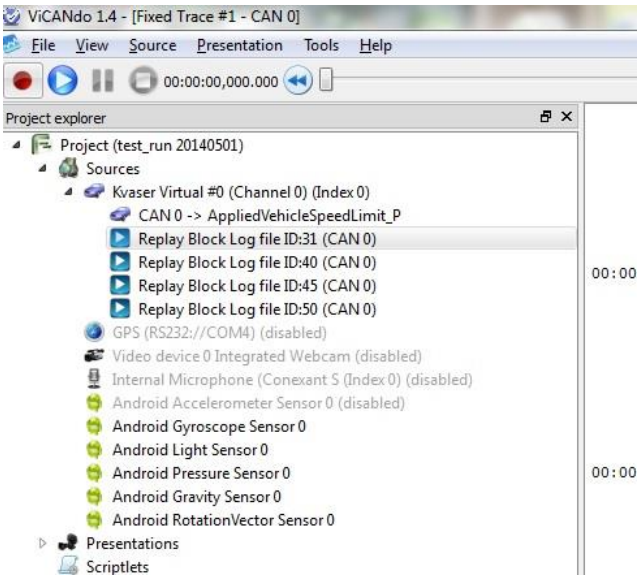
The replay block is activated by pressing the *Record* button. And the replay starts automatically when the measurement is active.



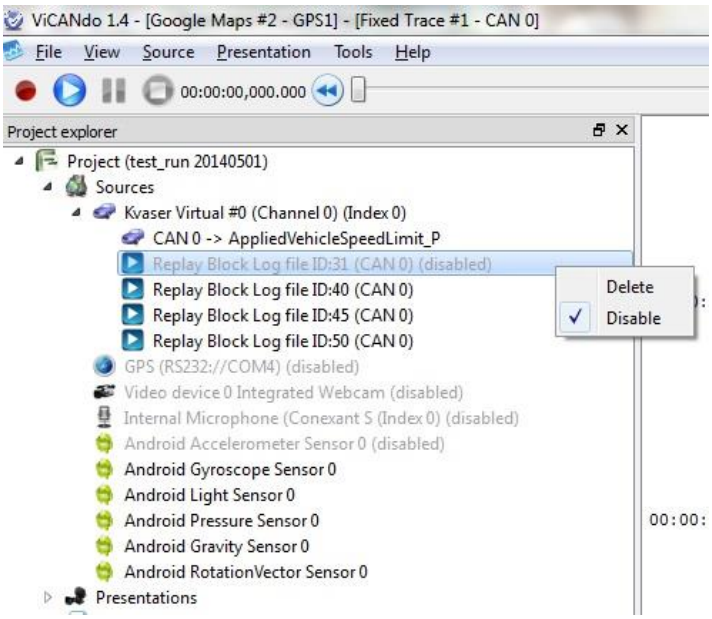
When replaying the the replay block, the rest of the ViCANdo CAN functions works as usual. Graphs and gauges can be picked either from the signal list or from fixed trace window.



Several replay blocks can be kept under the same source. The trafic from the replay blocks can also be mixed. So all active replay blocks will be replayed when the meassurement is armed.

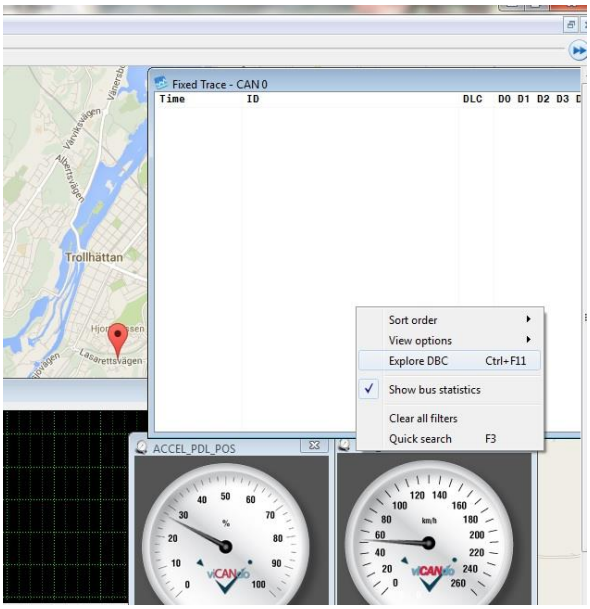


The replay blocks are disabled or deleted with a right click action

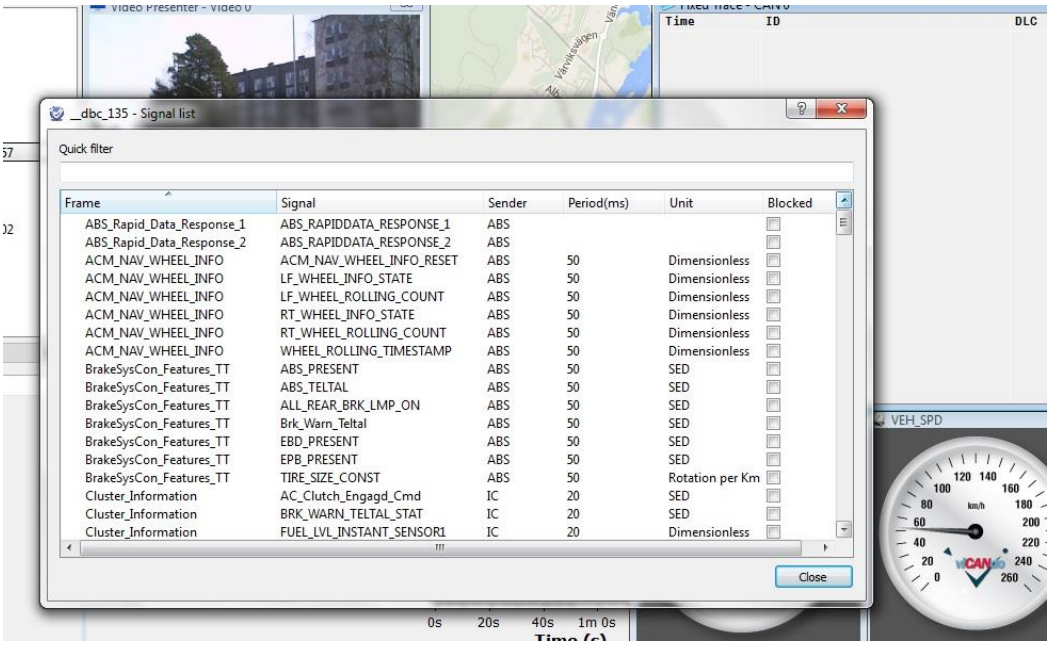


3.15 Off line use of Databases

To explore a dbc used in the project. There are 2 ways, either right click in the *fixed trace window* where the .dbc is used or using the key board *Ctrl+F11.*

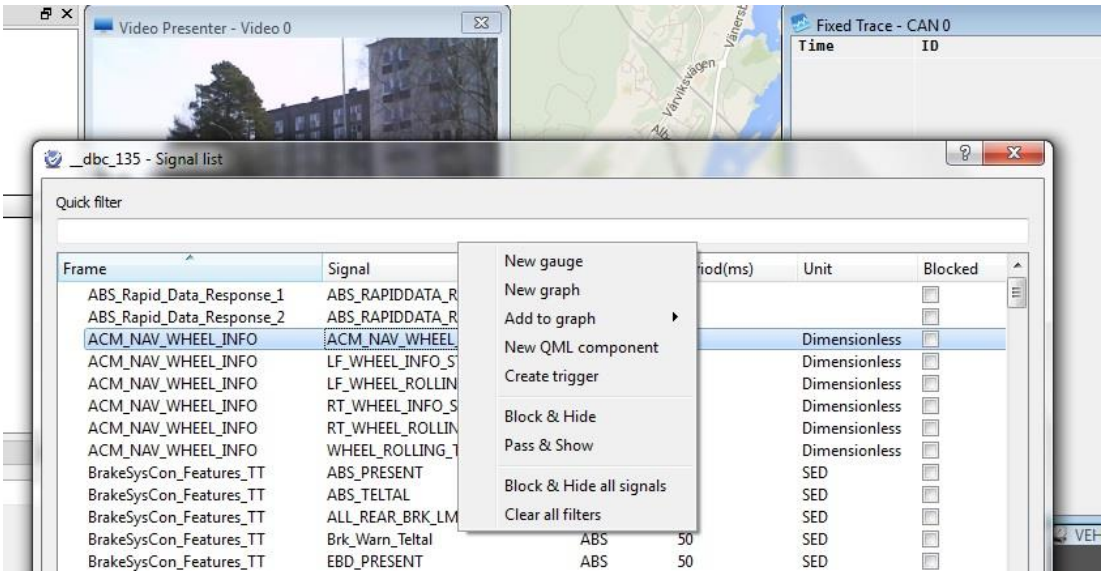


When doing so this view will show up



This view contains many features. You can i.e. choose to order signals by Frame, signal name, Sender, Periodic time and unit. You can filter away signals from your *fixed trace window,* and initiate extended functions.

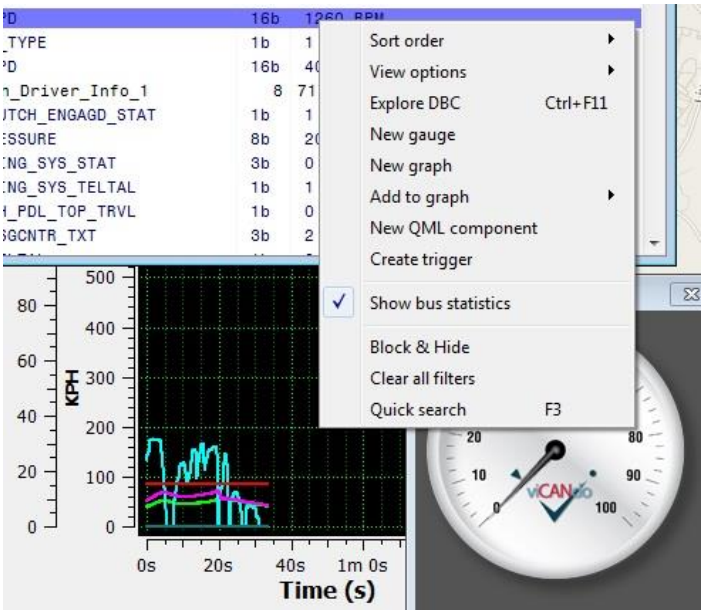
By Right clicking the signal or frame you options show up.



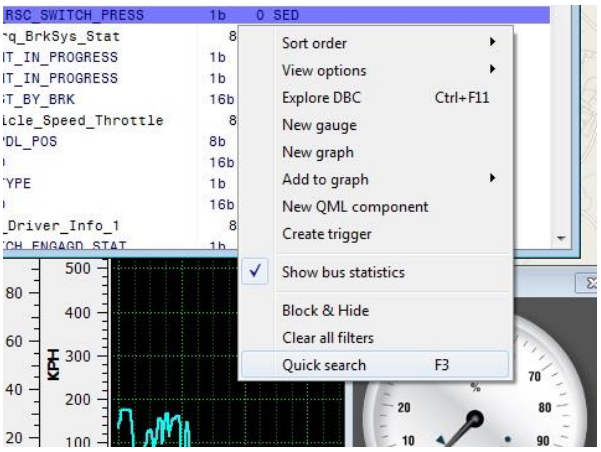
And from this point you can start to send signals to various display units, us it as triggers or connect them to QML-components.

3.16 Filters in Trace Windows

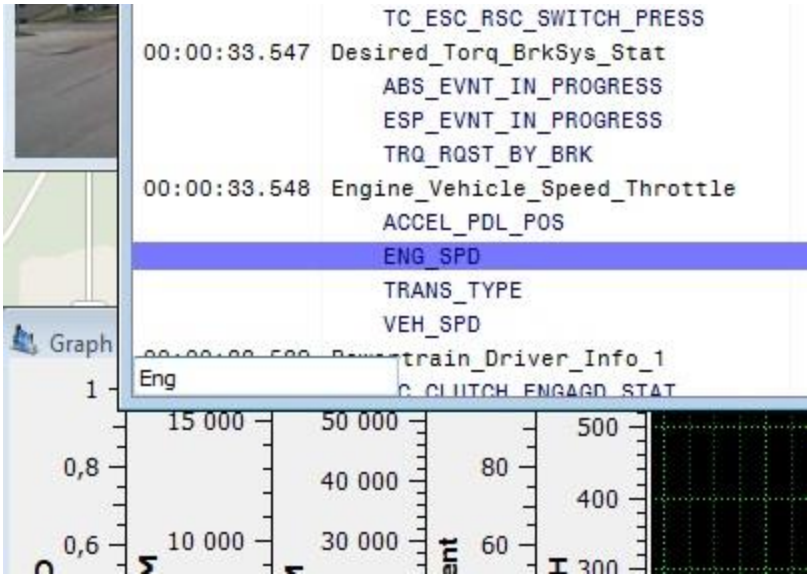
When the measurement is running there is also the possibility to filter directly in the *fixed trace window* by right clicking on a particular signal.



A new function in since version 1.4 is also the Quick Search function available also on short key *F3*



This opens up a small window at the lower left in the trace window where you can free text search in the *Fixed Trace Window.*



By typing in i.e. the letters *Eng* the cursor moves to the first hit contains *Eng*. By clicking the F3 key again the cursor moves to the next hit containing the letter combination *Eng*

3.17 Remote connection to ViCANdo functions

In some cases it makes sense to remotely control ViCANdo from another application. An example could be that you already have an application in Java or some other language that already does something that is useful, I.e. reading out a sensor value from an encoder. The input from an external application can be used to trigger events in ViCANdo. ViCANdo listen on port 14776

Following commands are possible to activate remotely:

Application.ClearConsole	Project.Marker8
Application.LicenseManager	Project.Marker9
Application.Quit	Project.New
Application.Settings	Project.Open
FixedTrace.ClearAllFilters	Project.Save
FixedTrace.ExploreDBC	Project.SaveAs
FixedTrace.QuickSearch	Session.Backward
Project.Marker0	Session.Forward
Project.Marker1	Session.Import
Project.Marker2	Session.Pause
Project.Marker3	Session.Record
Project.Marker4	Session.Search
Project.Marker5	Session.Start
Project.Marker6	Session.Stop
Project.Marker7	Tools.CANTrafficGenerator

The commands can also be combined, so *Session.Record* could be followed by *Project Marker0* to put a mark in the log file that the recording started on certain point in time, due to that a certain event occurred.

The next 2 pages contains a Python example on how to connect the socket, prints 4 log markers, stops and decouples the socket.

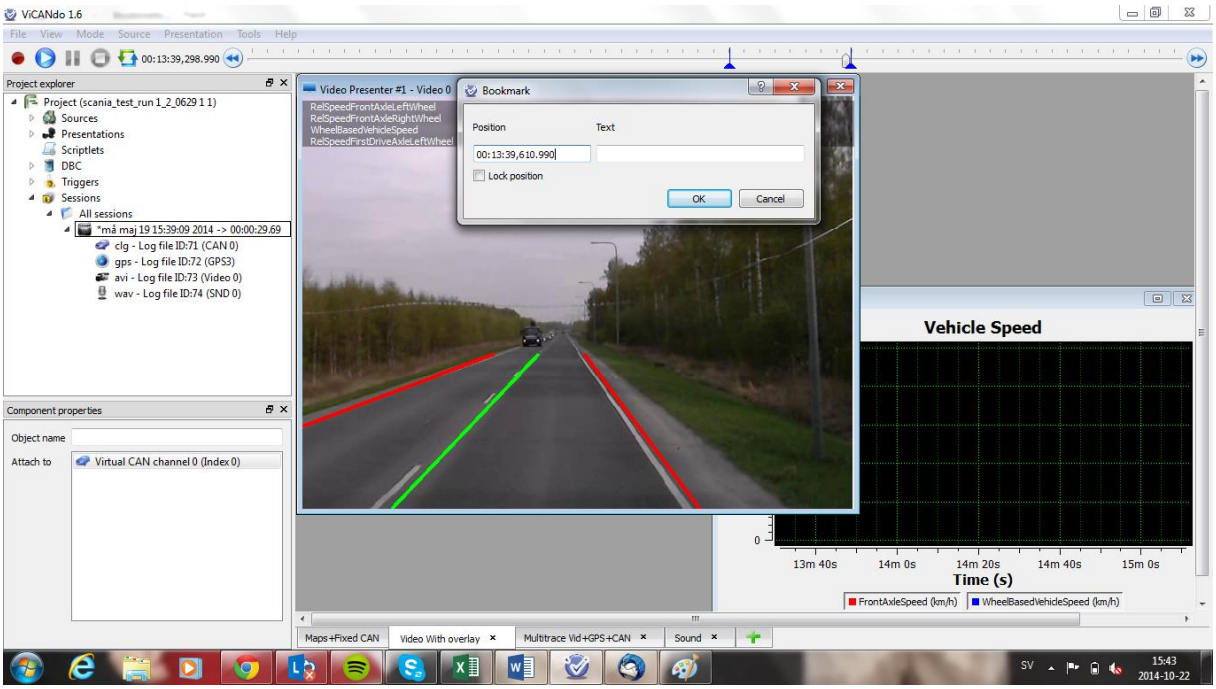
Remote connection example code:

```
#!/usr/bin/env python

import socket

import time

s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)

s.connect(('127.0.0.1', 14776))

welcome_msg = s.recv(1024);

print "Got '%s'" % welcome_msg.rstrip()

s.send('Session.Record\n')

ok = s.recv(1024)

if ok.rstrip() != "OK":

    print "ERROR: Session.Record command failed"

    exit(-1)

time.sleep(1)

s.send('Session.Start\n')

ok = s.recv(1024)

if ok.rstrip() != "OK":

    print "ERROR: Session.Start command failed"

    exit(-1)

time.sleep(1)



# Record 10 seconds

s.send('Project.Marker0\n')

ok = s.recv(1024)

if ok.rstrip() != "OK":

    print "ERROR: Project.Marker0 command failed"

    exit(-1)
```

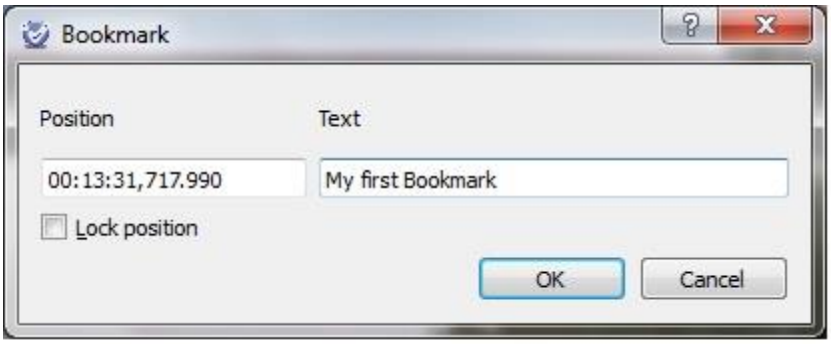
```
time.sleep(4)

s.send('Project.Marker1\n')

ok = s.recv(1024)

if ok.rstrip() != "OK":

    print "ERROR: Project.Marker1 command failed"

    exit(-1)

time.sleep(4)

s.send('Project.Marker2\n')

ok = s.recv(1024)

if ok.rstrip() != "OK":

    print "ERROR: Project.Marker2 command failed"

    exit(-1)

time.sleep(4)

s.send('Project.Marker3\n')

ok = s.recv(1024)

if ok.rstrip() != "OK":

    print "ERROR: Project.Marker3 command failed"

    exit(-1)

time.sleep(4)

s.send('Session.Stop\n')

ok = s.recv(1024)

if ok.rstrip() != "OK":

    print "ERROR: Session.Stop command failed"

s.close()
```

3.18 Working with book marks, live play back and editing your log file

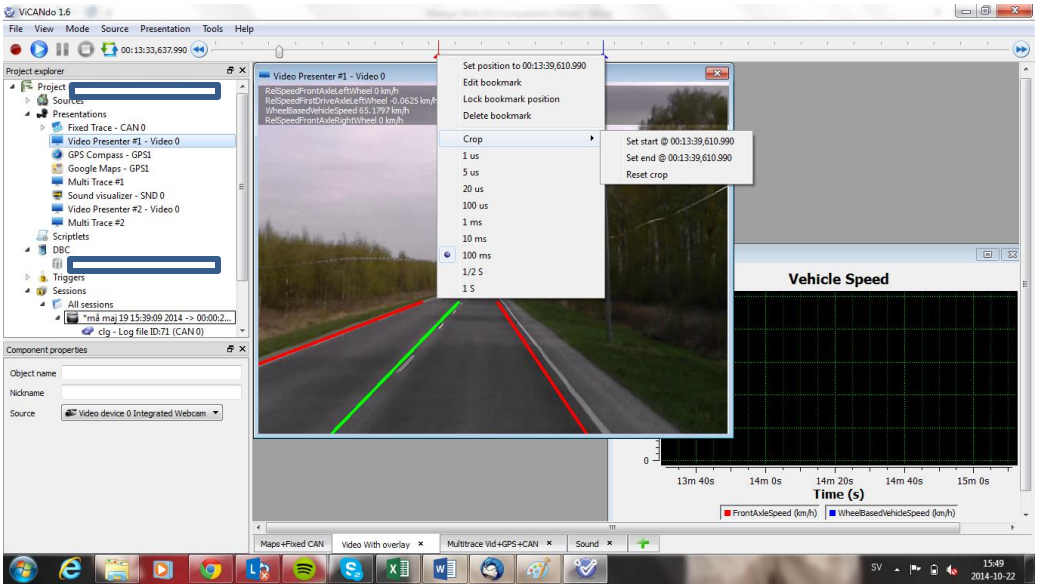
To make it easier to navigate in the normally pretty large log files, book marks have been introduced since version 1.6. To set a book mark just double click on the time line at the top of ViCANdo



It is also possible to add properties to a book mark like a nick name

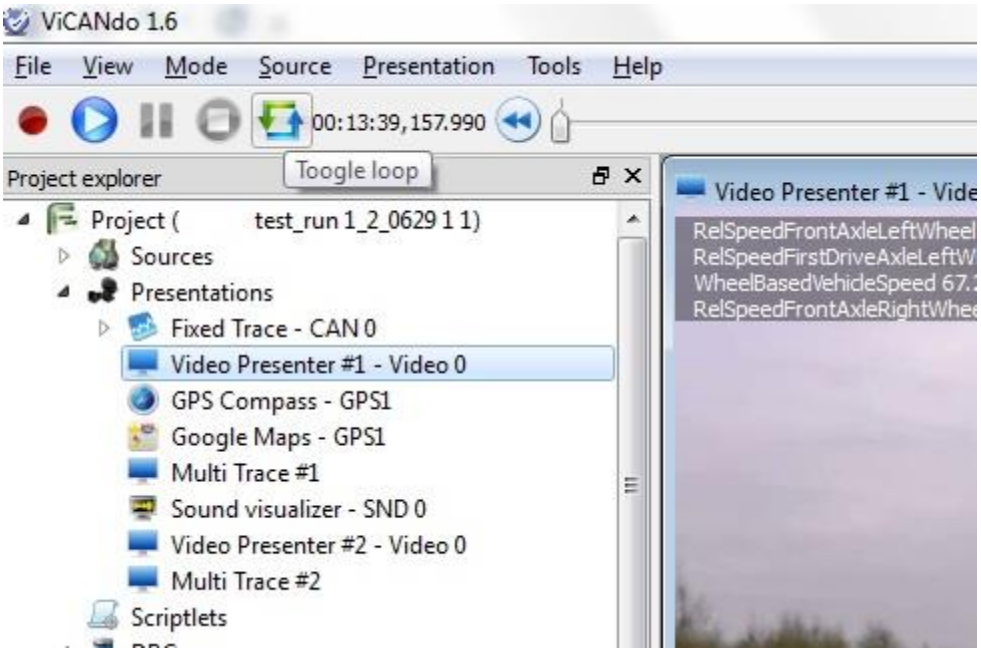


Now having at least two book marks it is possible to crop the log file to reduce the time replayed. This can be done by right clicking the book mark and choosing crop

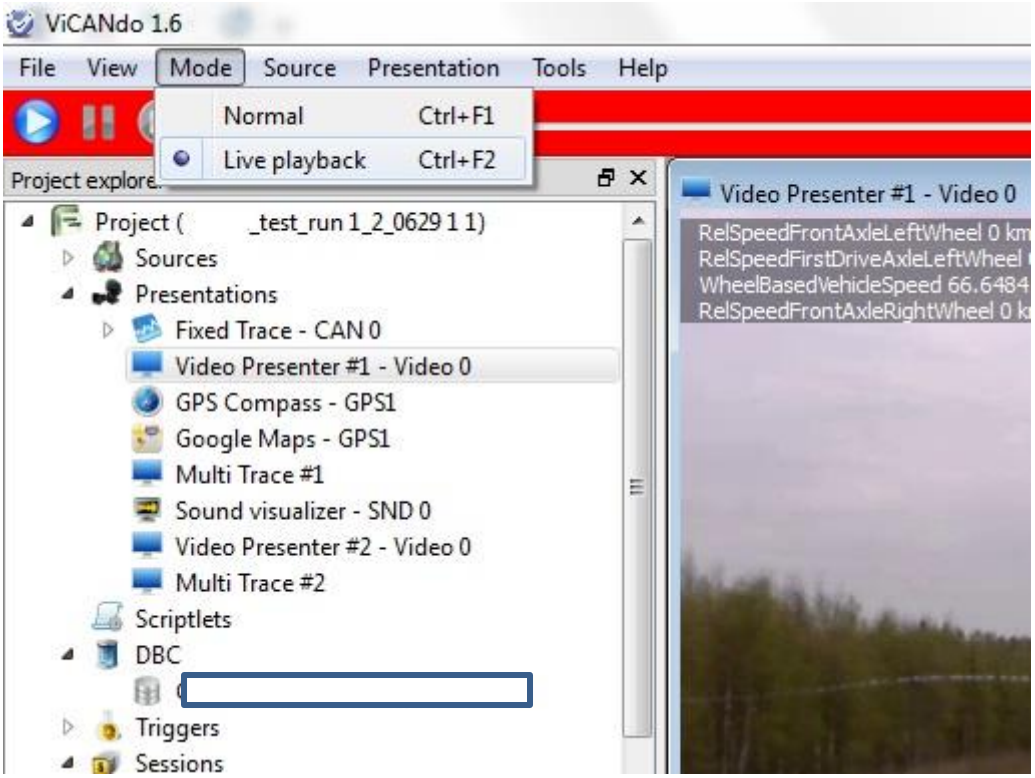


This will reduce the log file replayed in to a more compact log file to work with. Still keeping all the timing correct and proper.

It is also possible to run the replay in an end less loop by activating the “loop” function button. This will make the log file replay over and over again

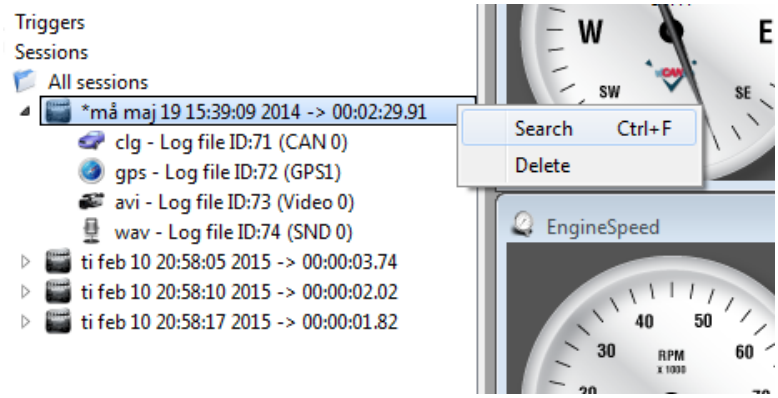


In version 1.6 or later, it is possible to switch the mode for the replay from the internal replay to replay of all sources to real Hardware. *This feature must be used with caution as if it is connected to a live vehicle or machine my cause risk to the user.* Hence, when activated the time line lights up in red. This enable the user to replay the whole log file to i.e. stimulate an ECU as there were real inputs and reproduce and error with very high accuracy.

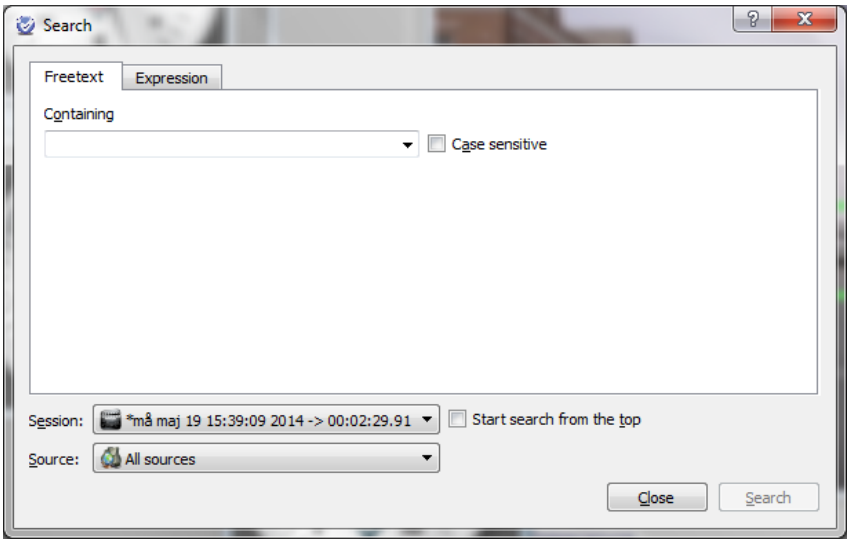


3.19 Advanced search in log files

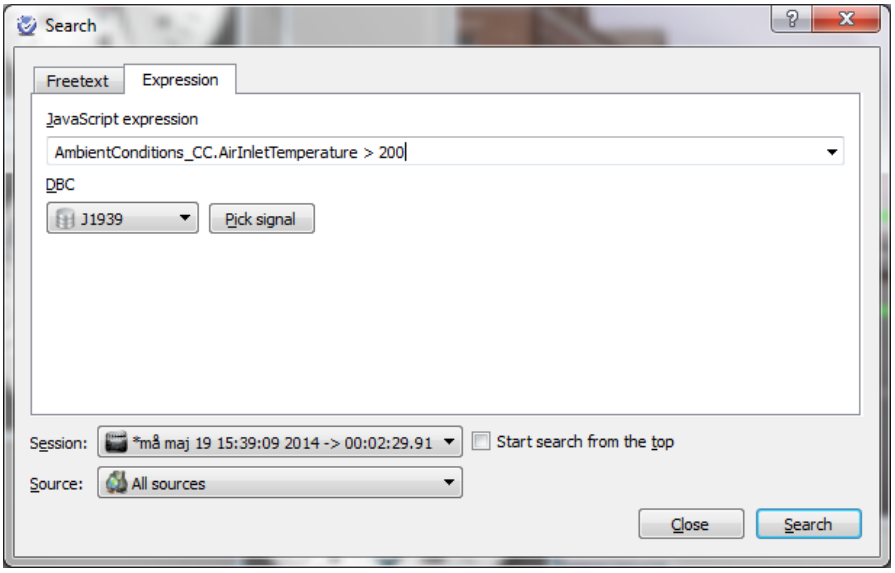
By right clicking “Session” and picking “search” or “Ctrl+F”



Following dialog will appear. This dialog has two modes. Either free text search or expression search

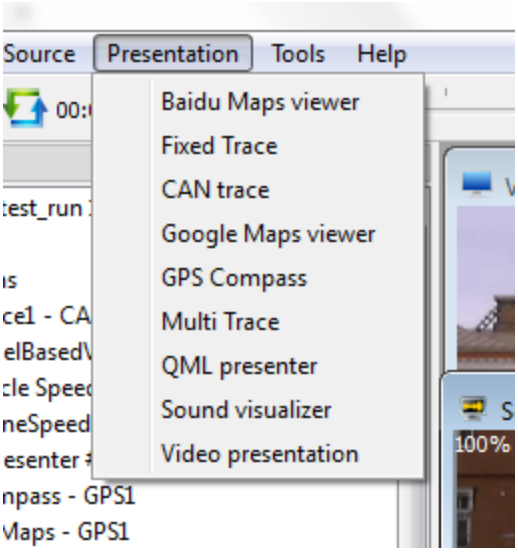


In the free text search you can search on any word and the closest following 1000 hits, following the position of the time stamp pointer will appear.

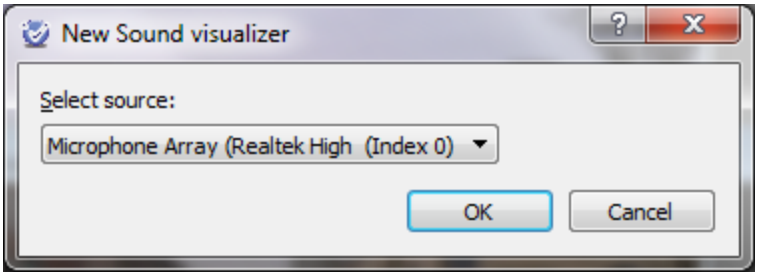


In the expression tab, you can pick signals from your database and coditions, as in this case, values larger than 200. When running the search, closest following 1000 hits, following the position of the time stamp pointer will appear. In this dialogue you can also freely program your search criterias using JavaScript. Please consult the JavaScript manual for more details.

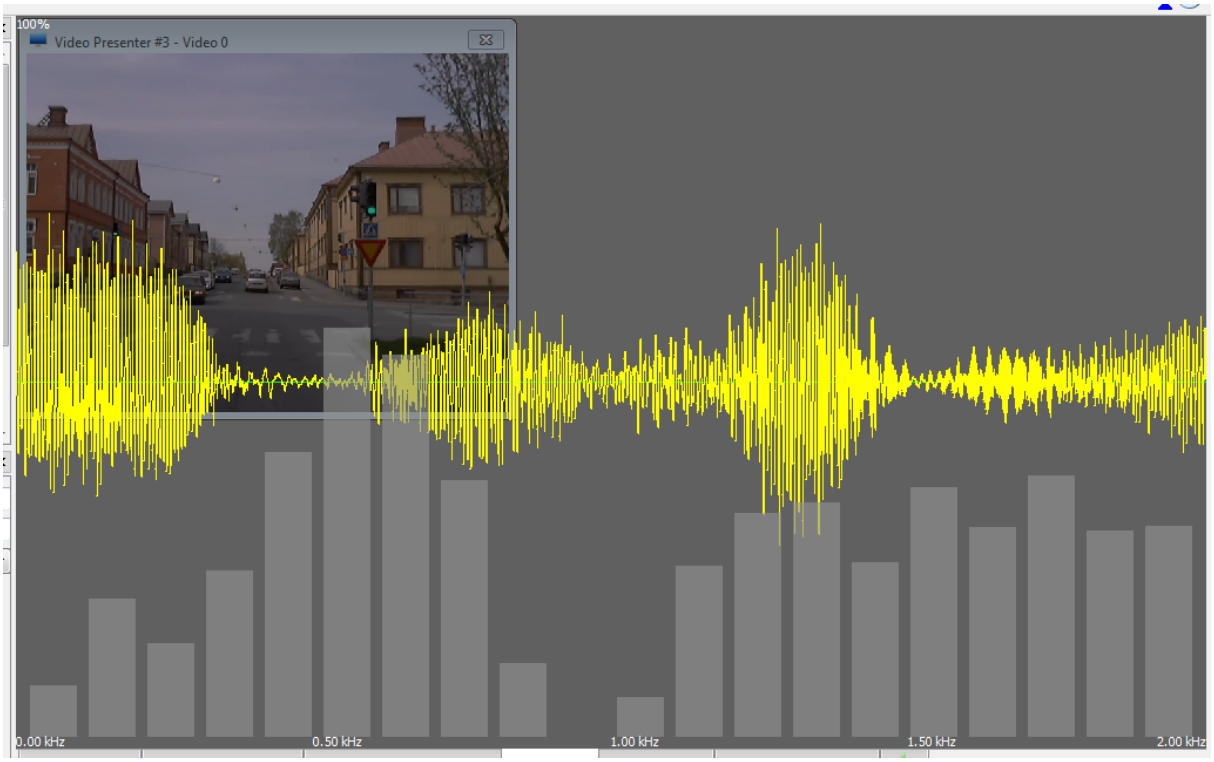
3.20 Working with sound sources and FFT analysis



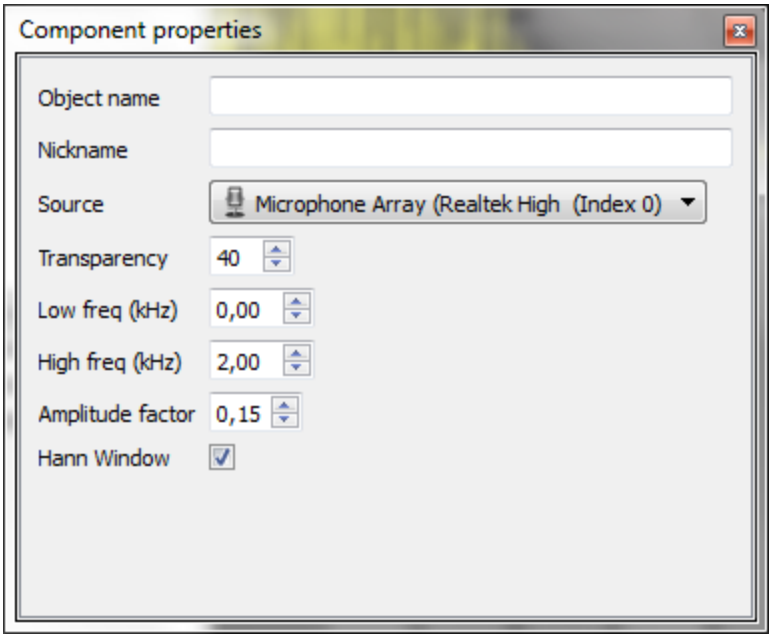
Start off adding a sound visualizer and associating a source.



When the source is associated a sound visualizer will appear

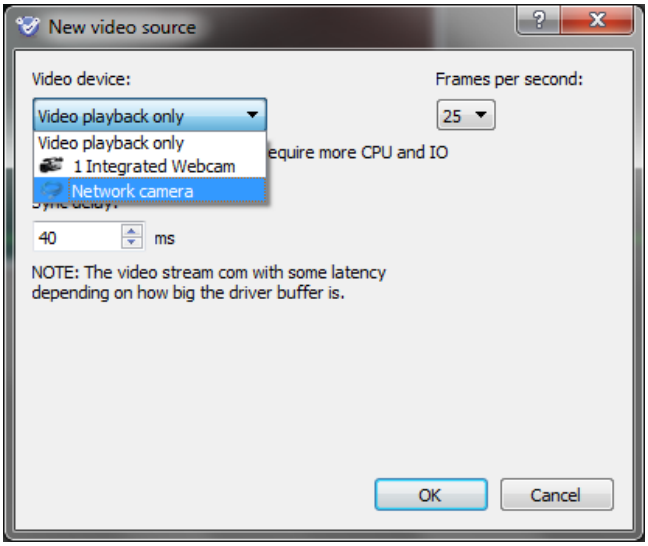


The sound visualizer has a row of setting that can be found under it´s “Component properties”

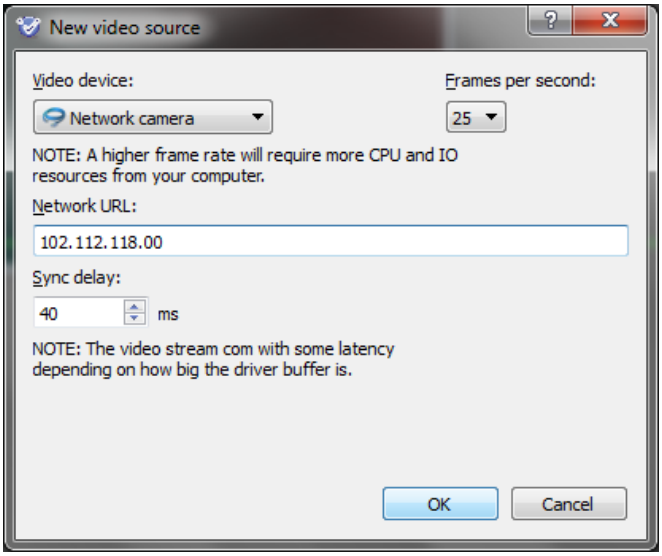


3.21 Working with Network cameras

Start of creating a source for “network camera” it can be found under “Source” on the main menu.

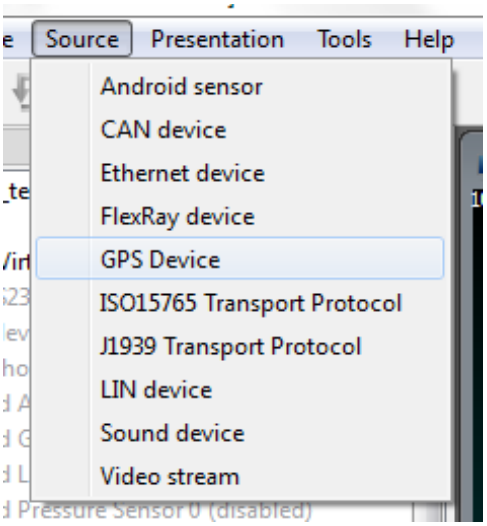


Start of creating a source for “network camera” it can be found under “Source” on the main menu. Type in the network URL to your camera and you are ready to go.

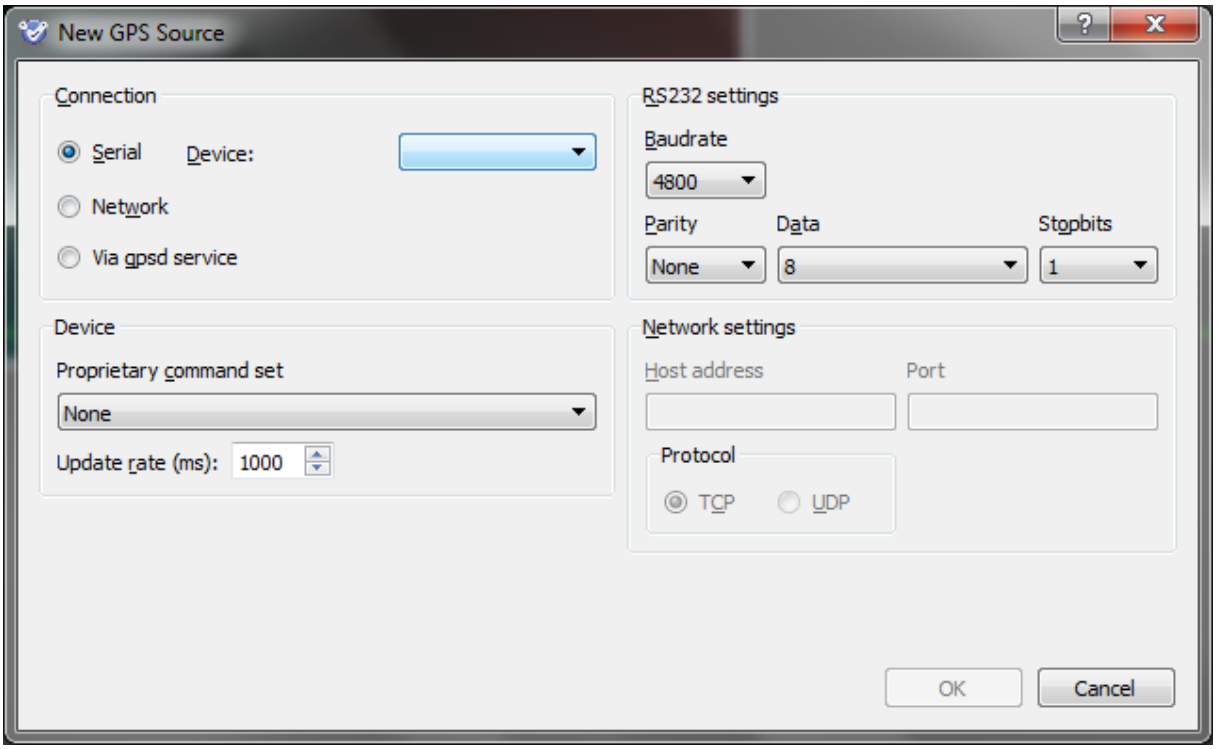


3.22 Working with gpsd

Start of creating a source for “GPSD” it can be found under “Source” on the main menu.

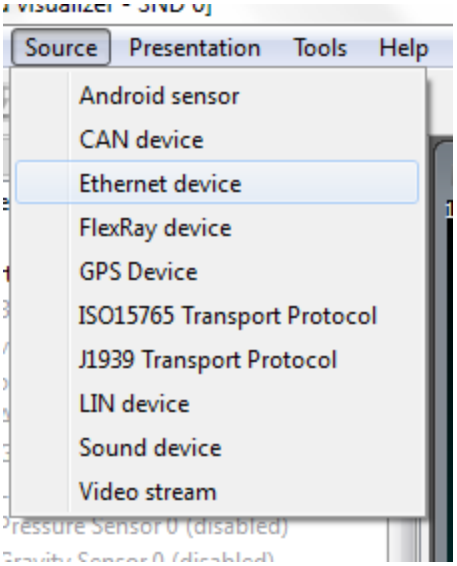


Type in the server parameters necessary for your GPSD device(s) and you are ready to go.

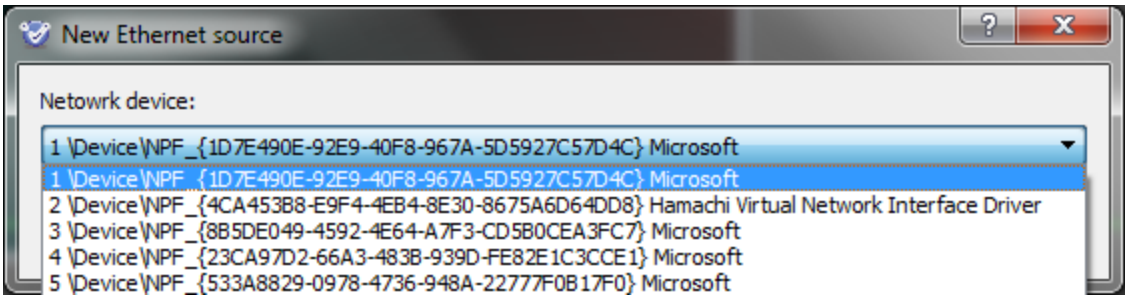


3.23 Working with Ethernet

Start of creating a source for “GPSD” it can be found under “Source” on the main menu.

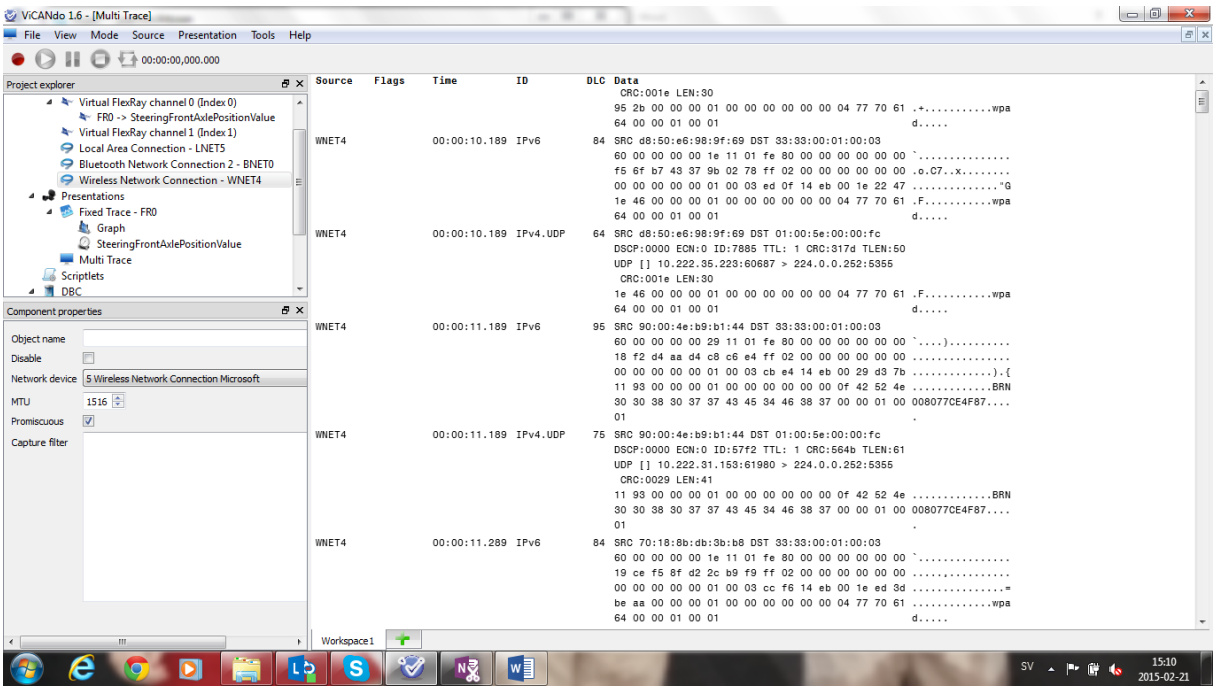


Choose your preferred Ethernet device(s) and you are ready to go.



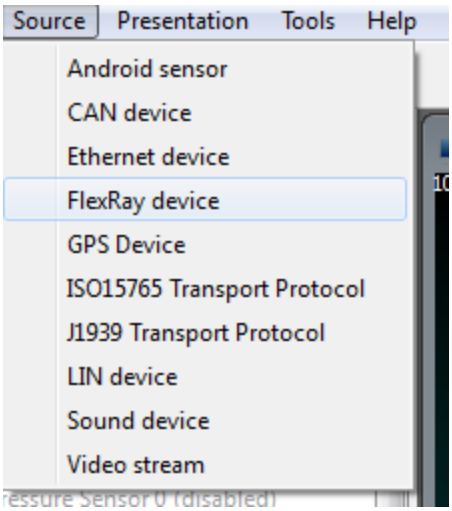
Please note that ViCANdo currently supports UDP and TCP level of Ethernet only.

A typical multi trace window browsing the Ethernet traffic looks like this:

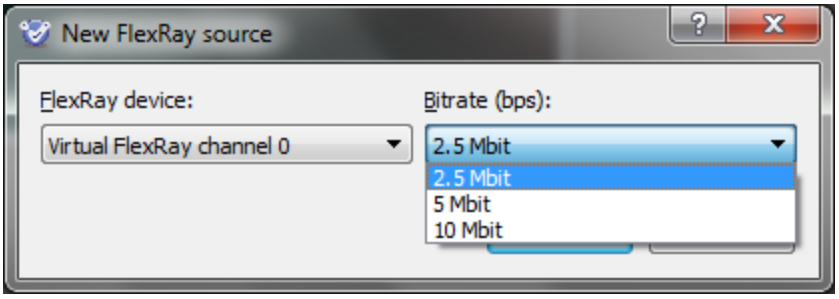


3.24 Working with FlexRay

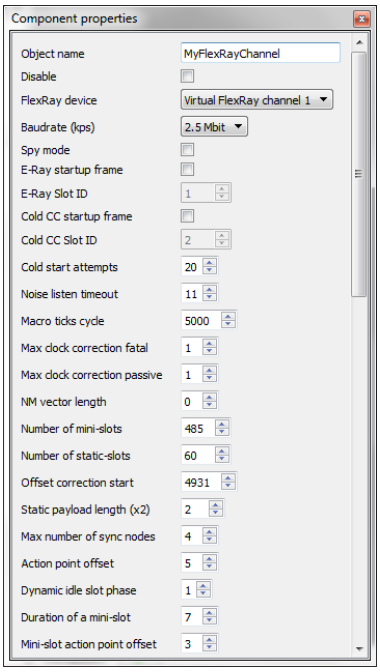
Start of creating a source for “FlexRay device” it can be found under “Source” on the main menu.



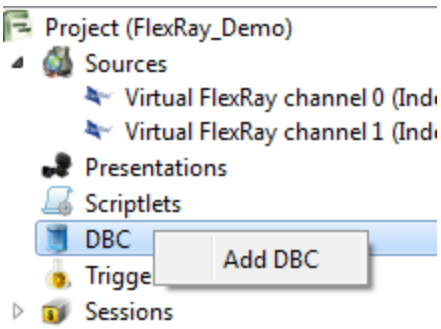
Choose device and set the bitrate



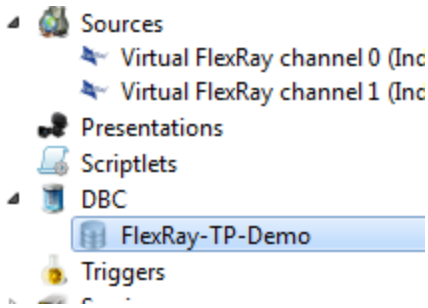
The settings of each Flexray channel is available under component properties



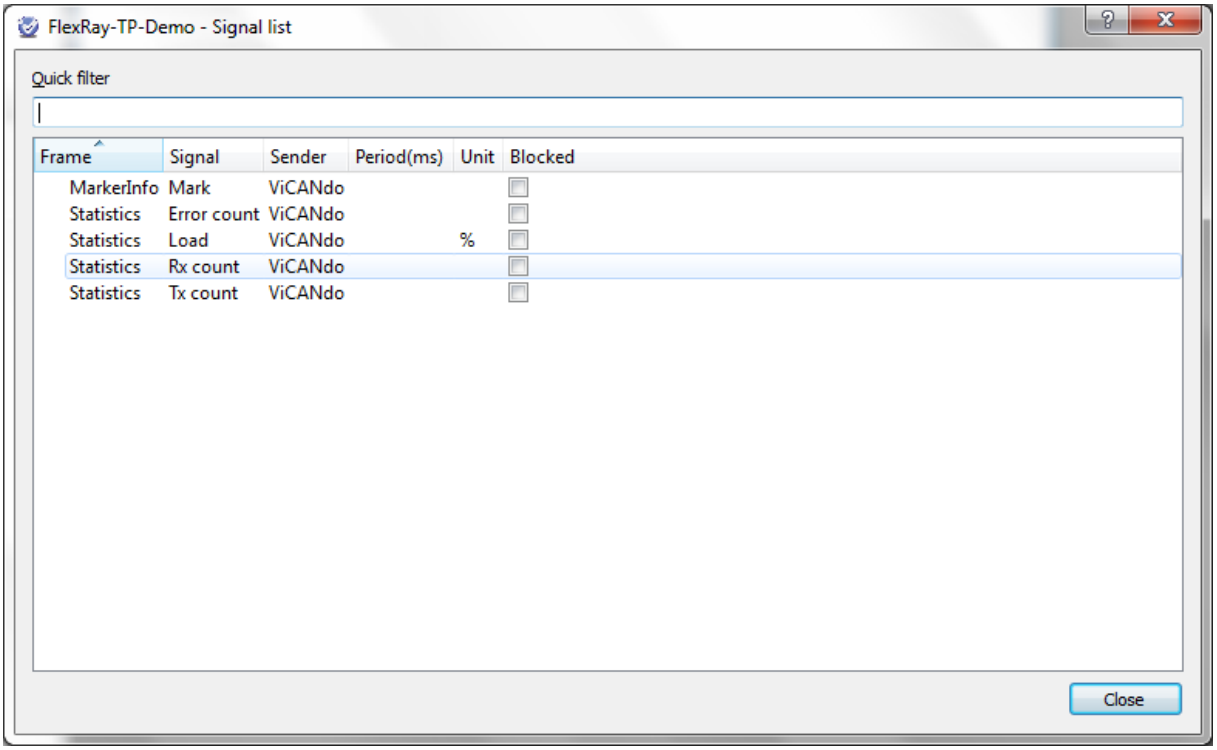
Just as with CAN and LIN you have to associate a suitable data base



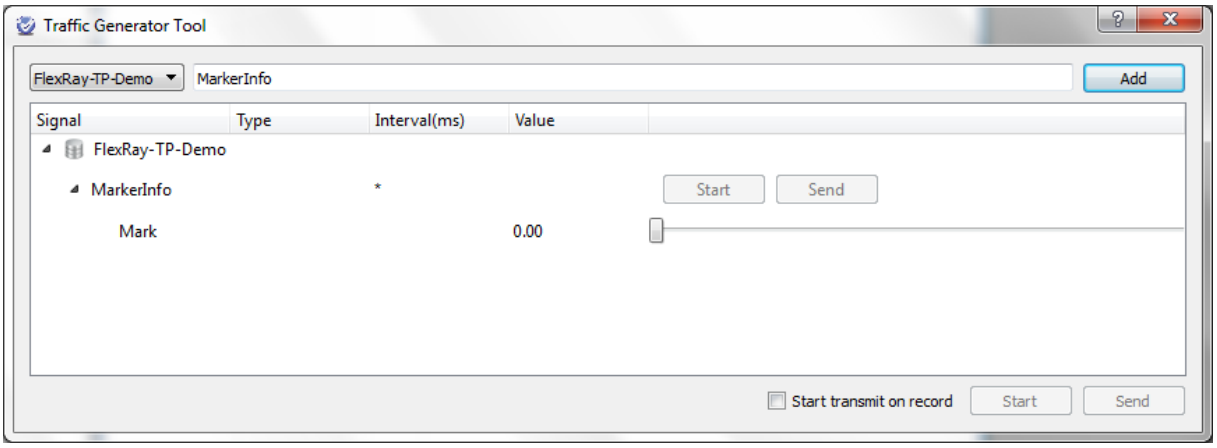
In this case we choose a Fibex file, but it could as well be a .dbc file.



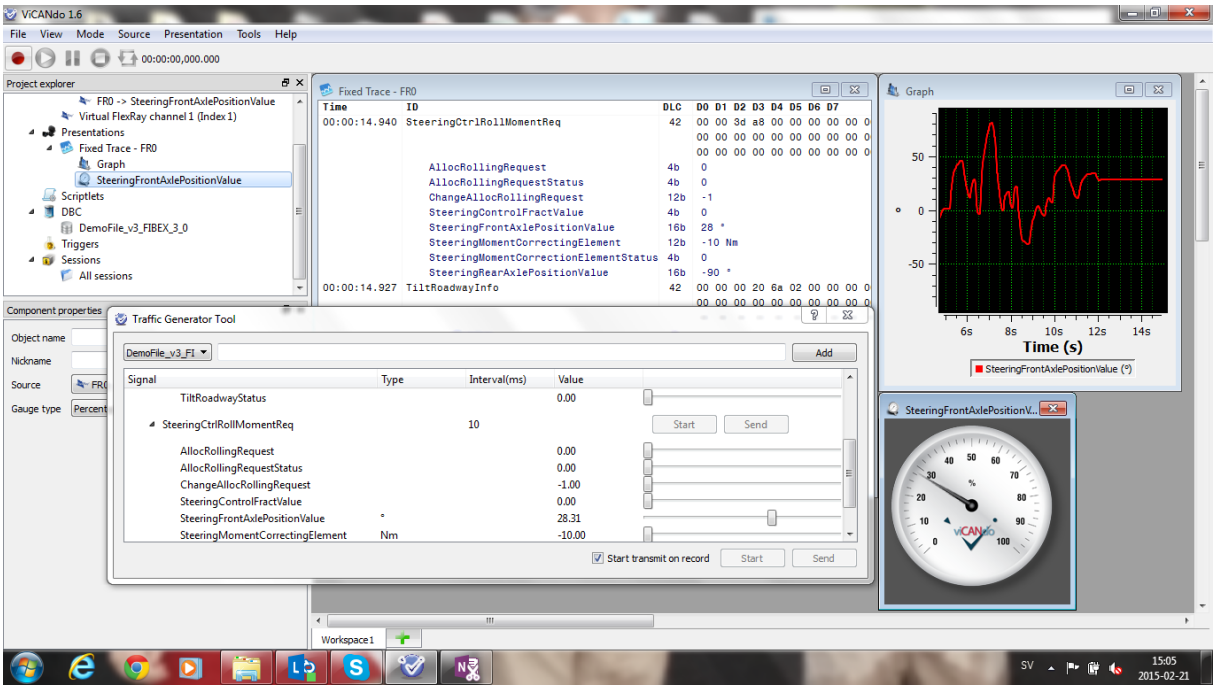
From this point the function is perfectly the same as with i.e. CAN or LIN. You can call up the signals for association actions like triggers or plots.



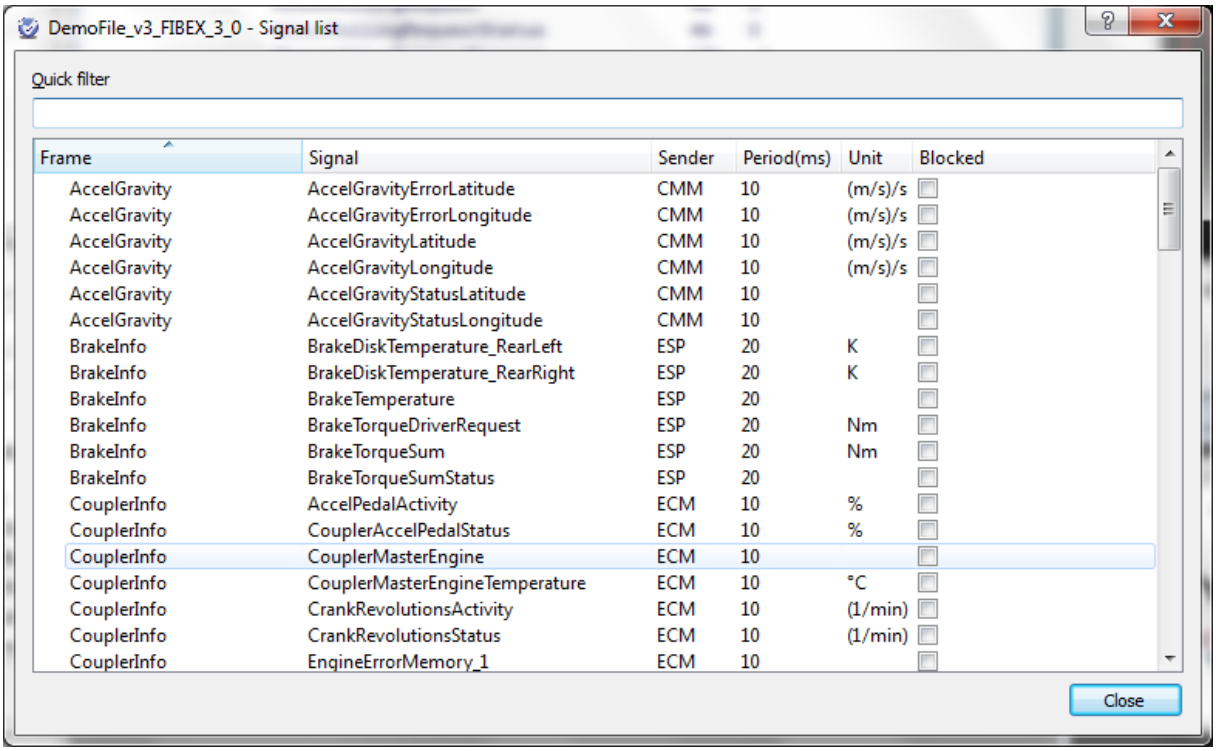
You can create traffic generators



To associate the signals to trace or Graph windows works exactly the same way as all other busses.



Right click in fixed trace window on a specific signal, or press Ctrl+F12 to have a signal list view.

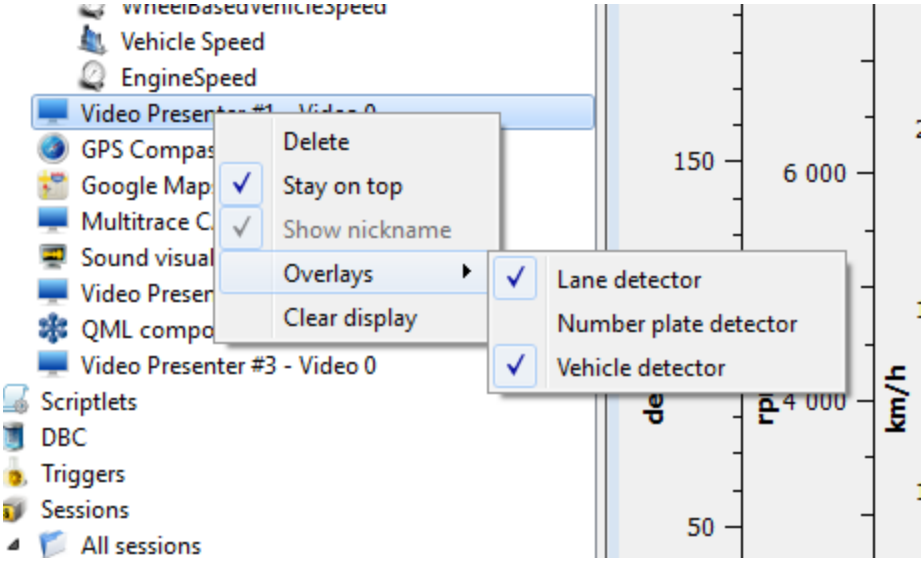


Frame	Signal	Sender	Period(ms)	Unit	Blocked
AccelGravity	AccelGravityErrorLatitude	CMM	10	(m/s)/s	
AccelGravity	AccelGravityErrorLongitude	CMM	10	(m/s)/s	
AccelGravity	AccelGravityLatitude	CMM	10	(m/s)/s	
AccelGravity	AccelGravityLongitude	CMM	10	(m/s)/s	
AccelGravity	AccelGravityStatusLatitude	CMM	10		
AccelGravity	AccelGravityStatusLongitude	CMM	10		
BrakeInfo	BrakeDiskTemperature_RearLeft	ESP	20	K	
BrakeInfo	BrakeDiskTemperature_RearRight	ESP	20	K	
BrakeInfo	BrakeTemperature	ESP	20		
BrakeInfo	BrakeTorqueDriverRequest	ESP	20	Nm	
BrakeInfo	BrakeTorqueSum	ESP	20	Nm	
BrakeInfo	BrakeTorqueSumStatus	ESP	20		
CouplerInfo	AccelPedalActivity	ECM	10	%	
CouplerInfo	CouplerAccelPedalStatus	ECM	10	%	
CouplerInfo	CouplerMasterEngine	ECM	10		
CouplerInfo	CouplerMasterEngineTemperature	ECM	10	°C	
CouplerInfo	CrankRevolutionsActivity	ECM	10	(1/min)	
CouplerInfo	CrankRevolutionsStatus	ECM	10	(1/min)	
CouplerInfo	EngineErrorMemory_1	ECM	10		

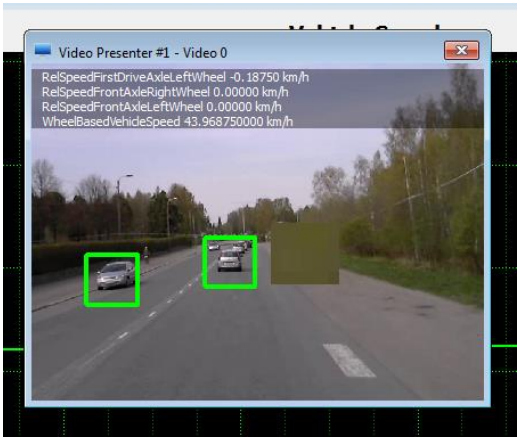
3.25 Working with Lane and vehicle detection

In ViCANdo 1.6 or later there are options for detecting Lanes, Other vehicles or number plates. These functions may vary from market to market, so please always contact your local Zuragon contact to get appropriate advice.

The detection overlays are activated by right clicking on the actual video presenter and choosing which option(s) that should be activated.

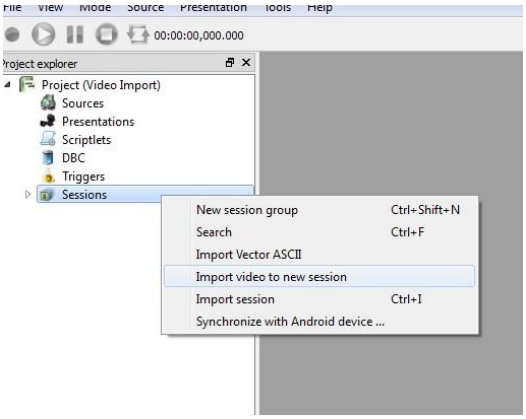


By activation they will show up in the video window right away.

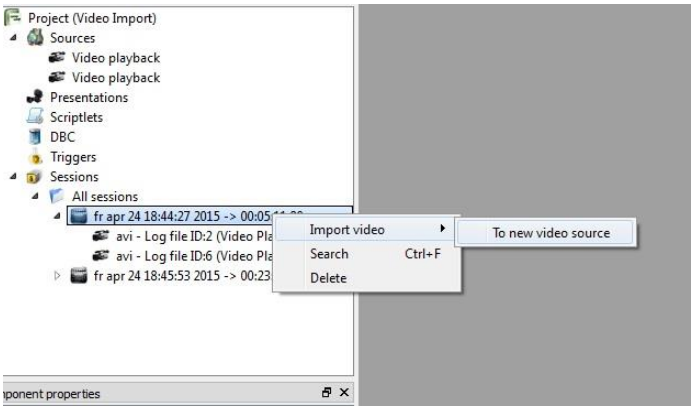


3.26 Working with import of multiple Video sources from other tools.

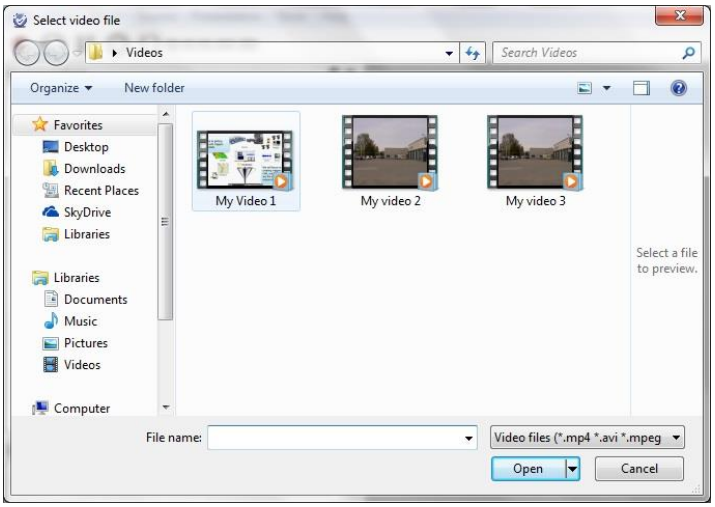
When doing development of algorithms it can in many cases make sense to be able to reuse legacy of recorded videos. To import a legacy video it has to be in .mpeg, . mp4 or .avi format. Right click the session folder:



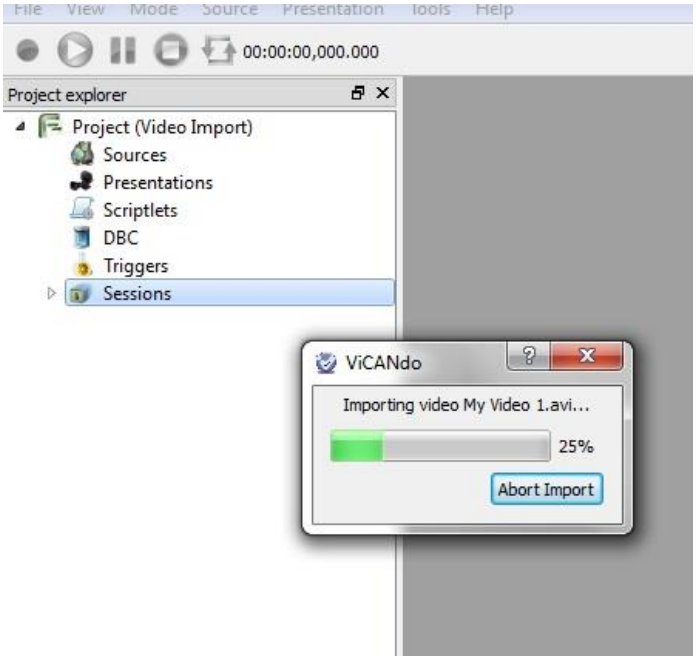
In this case chose, Import vide and to import it to a new video source as currently no video source exists.



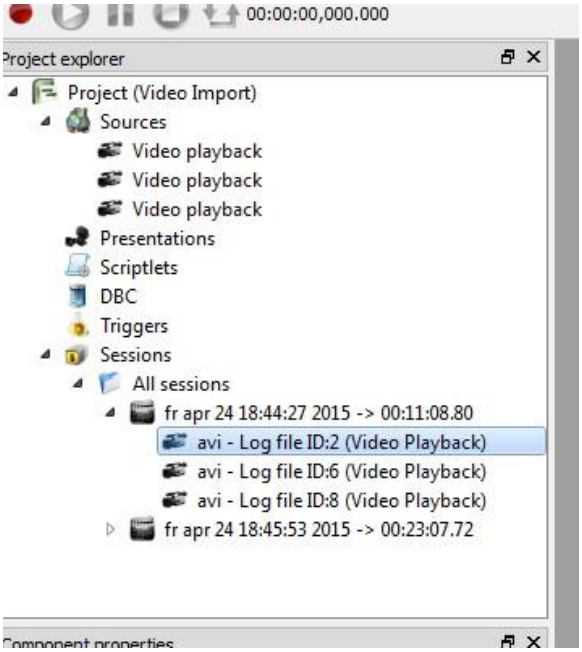
And choose the file of interest and click Open.



ViCANdo start an import of the file to be part of a ViCANdo project. Depending on the size of the file, this may take some time.

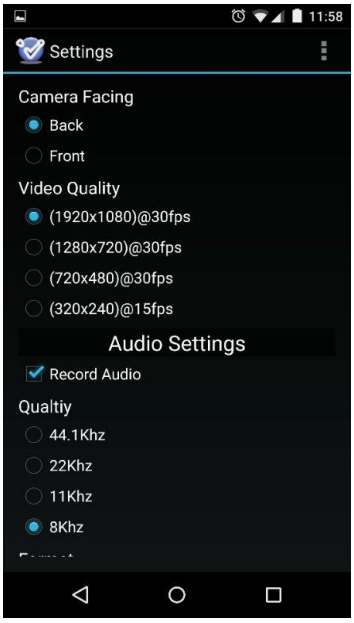


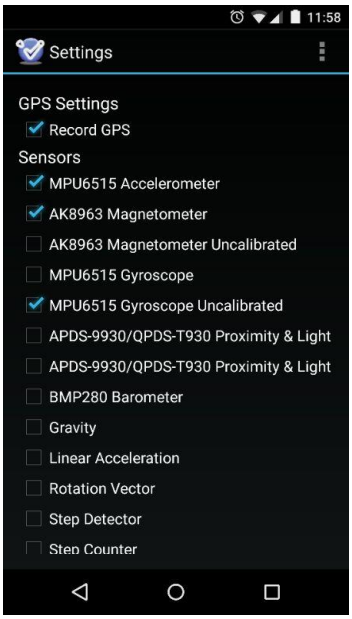
Now the file is imported and is part of a project. If you would like to import more than 1 video file to try out the algorithms on videos with various conditions, you just repeat the sequence above and build up a library of Video logs inside ViCANdo. This of course also possible to combine with import of other logs from existing i.e CAN, FlexRay or Ethernet log files. The work flow is perfectly the same.



3.27 Working with ViCANdroid as remote logger and J1979 scanner

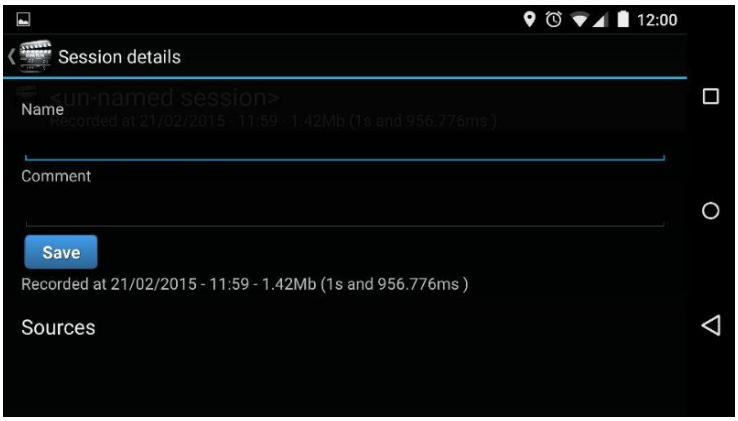
ViCANdo can be extended with the supplementary product ViCANdroid. ViCANdroid is an advanced Android based multimedia logger. ViCANdroid can log CAN traffic on up to 4 channels. ViCANdroid only works with Kvaser hardware. To set up ViCANdroid start with the “settings” menu that looks like this:



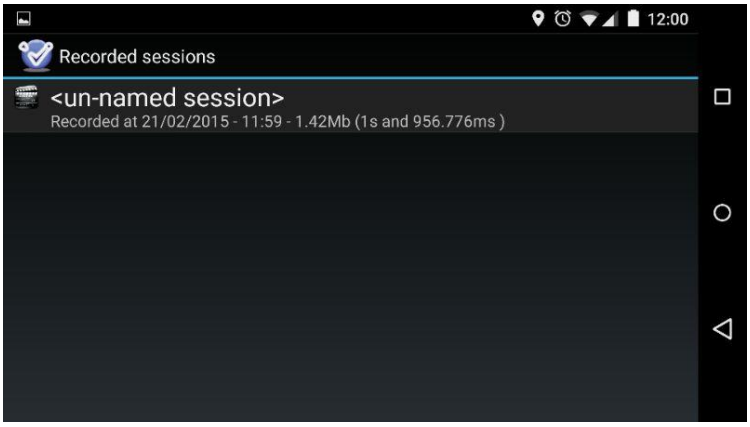


From this menu it is possible to pick and choose which resources that should be part of the measurement. Please note that every Android device have its own set of sensors and may vary from model to model.

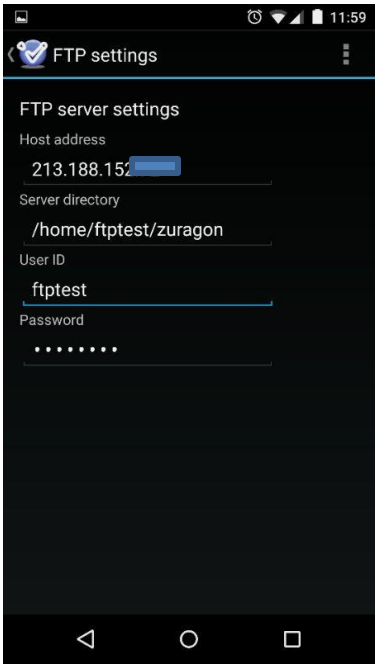
It is possible to the name the sessions under session details



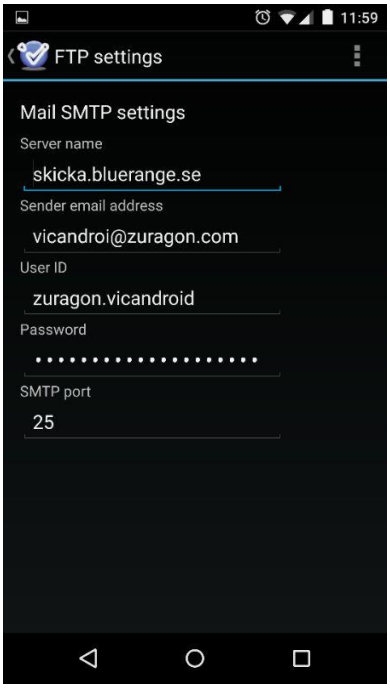
When a session is recorded it will show up under "recorded sessions" and looks like this:



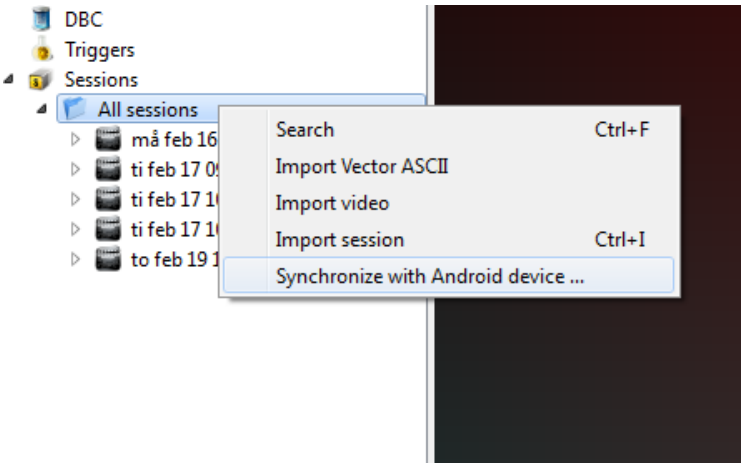
To transfer the log file from ViCANdroid to ViCANdo there are various options. One way Is to set up ViCANdroid to automatically transfer the log files to a FTP server. This is done in the “FTP Settings” menu.



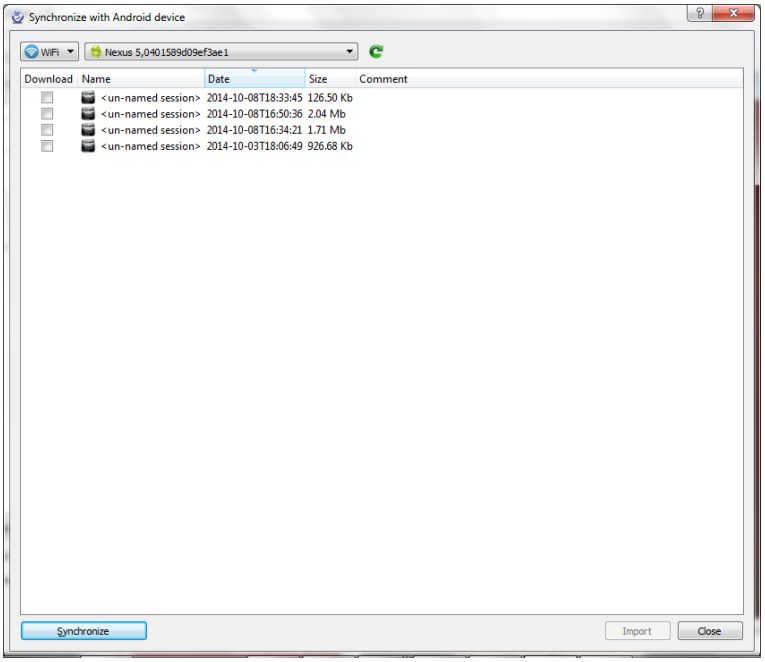
It is also possible to get a notification, when a ViCANdroid has i.e. triggered on an event by e-mail or SMS. To set up such a notification one have to put in the mail settings into the FTP settings tab.



There is also another way to pull off the log files from ViCANdroid. By putting the Android device to work as a hotspot. It will be possible for ViCANdo to find the device by right clicking on “All sessions” and “Synchronize with Android device”.

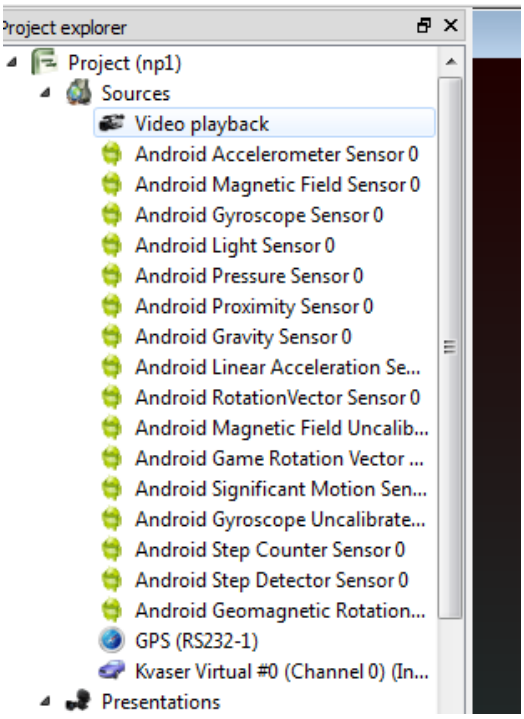


The following dialogue will open:

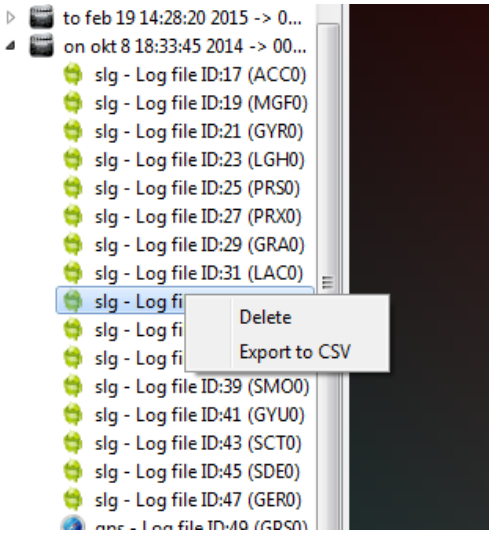


In this dialogue it is possible to choose which log files to import and by pressing “Import”, these log files will be transferred to the project catalogue of ViCANdo.

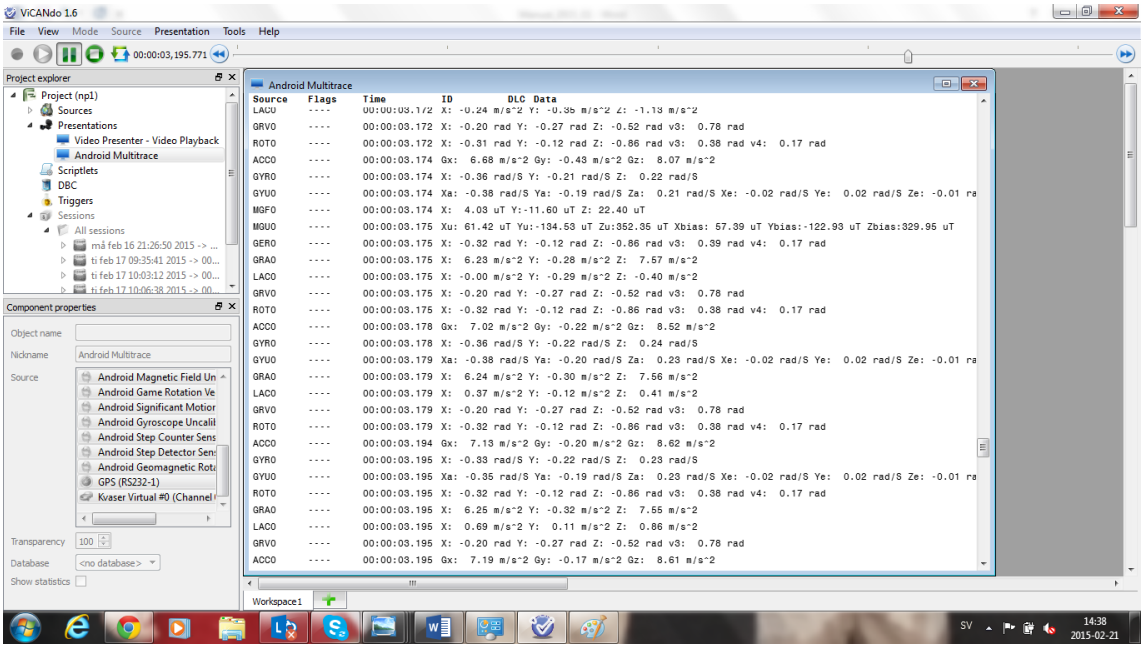
The new Sources coming from the Android device will show up in the project just like any other source, and from this point it is possible to deal with just like any signal from any other source inside ViCANdo.



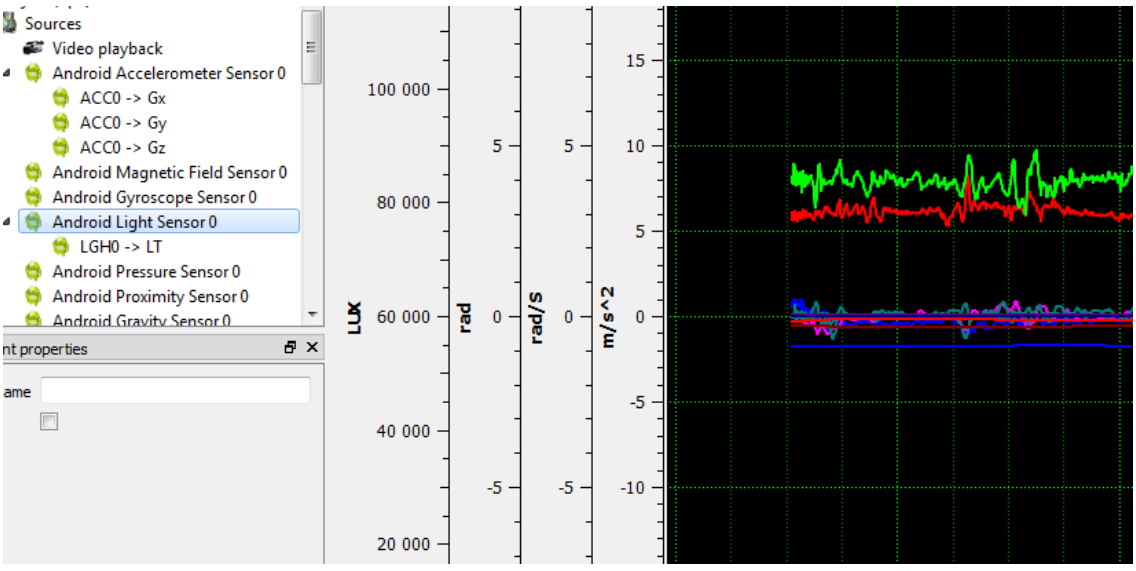
It is also possible to export the log files created by the Android device in CSV format if post analysis in other tools than ViCANdo if necessary.



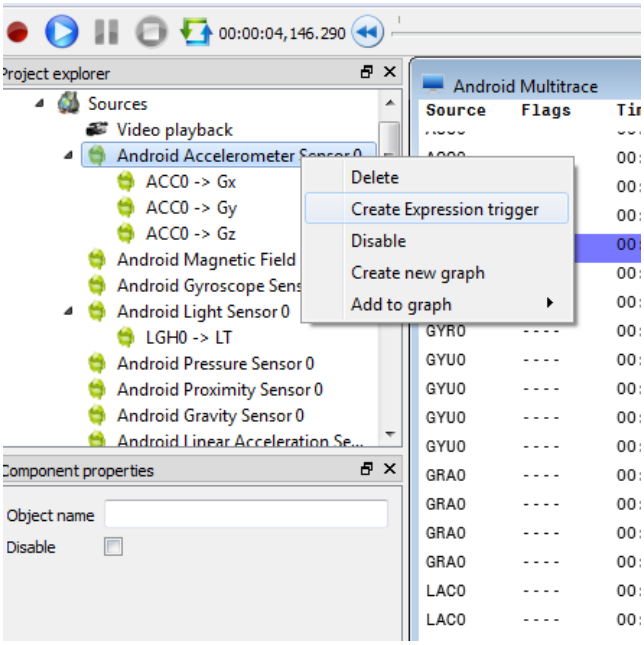
The Android created signals looks like this in a Multi trace window, where they are time stamped and the measured data is shown with its correct units.



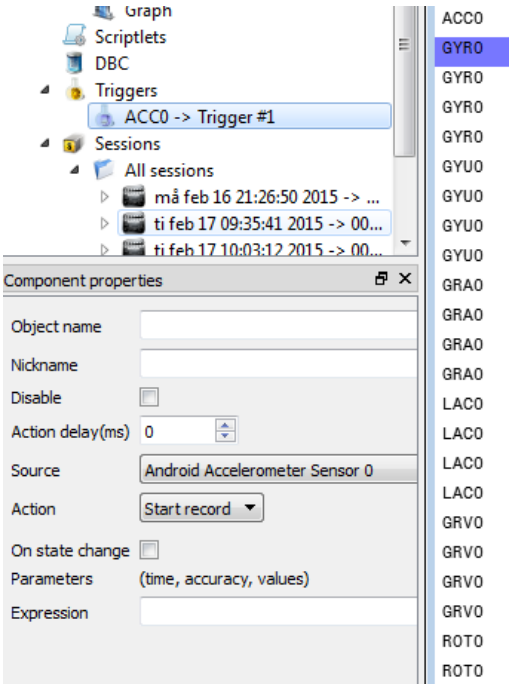
Or it is possible to plot the signals in a Graph Window.



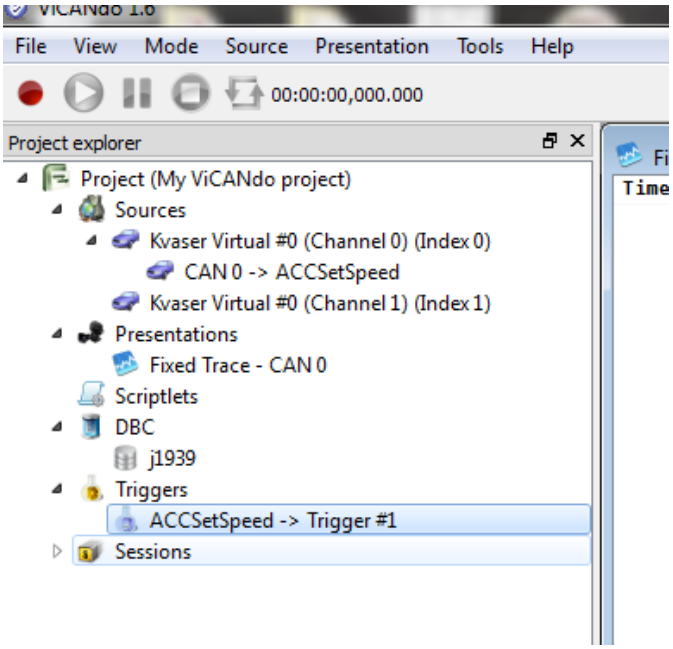
To create triggers for ViCANdroid, the trigger as such has to be created first in ViCANdo.



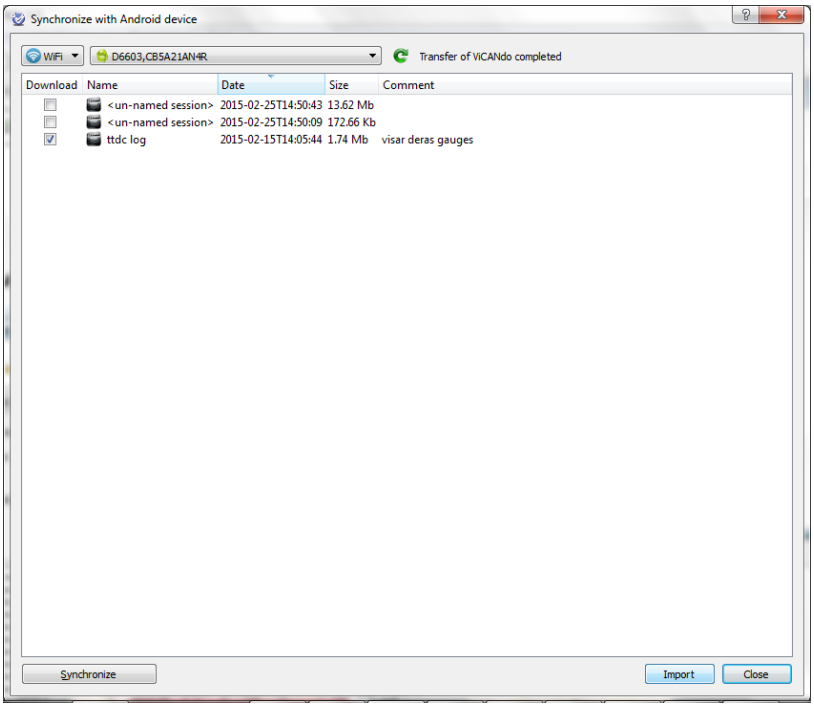
The logic is the same independent of which signal type it is. The trigger condition is created in the component properties of the trigger.



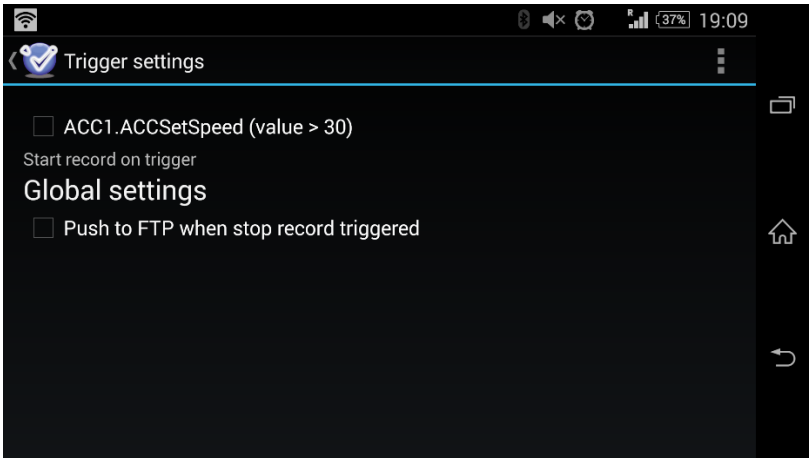
When the triggers works well in ViCANdo, they can be transferred to the Android device by choosing "Synchronize with Android device" on the "All Sessions" menu.



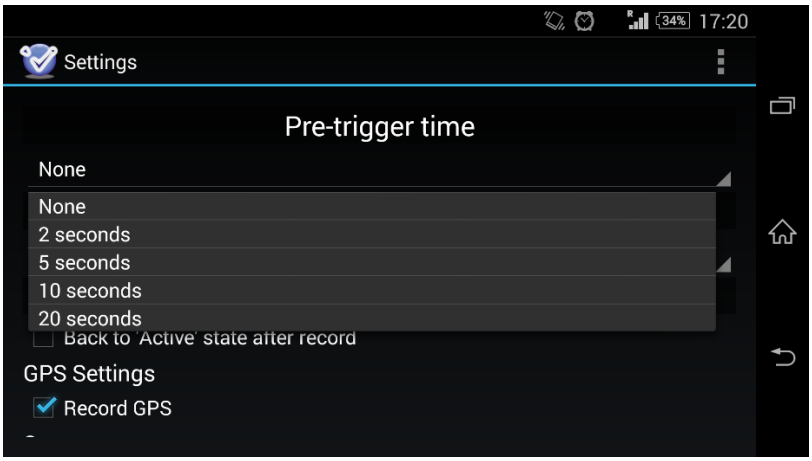
Klick "Synchronize" in the menu that pops up

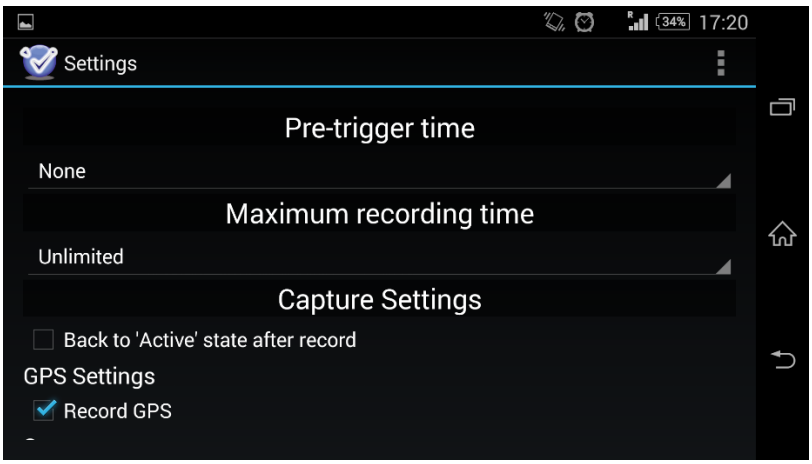


And the trigger is visible and active to use in ViCANdroid



From this point you can set pre and post triggers as described below

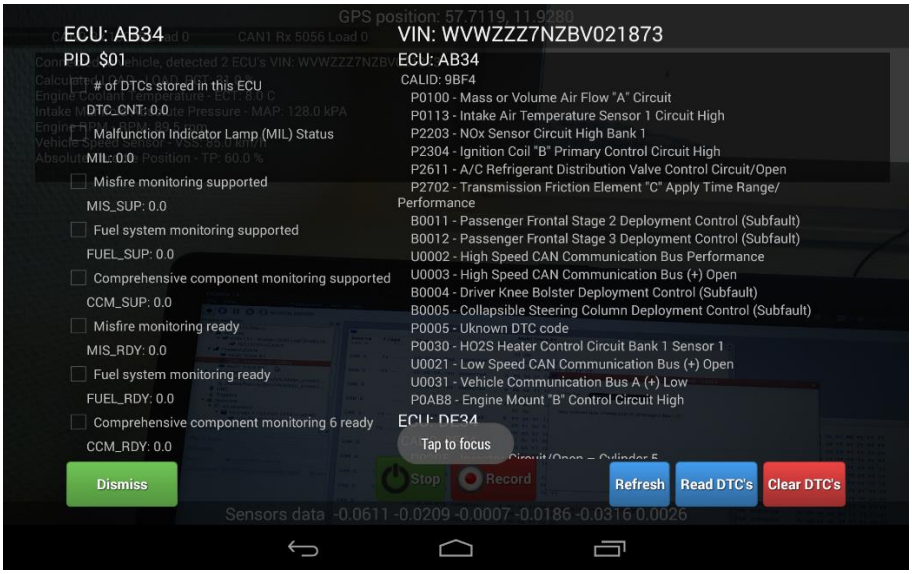




Option J1979 scanner

The ViCANdroid option J1979 covers the standard for read out of diagnostic data and error codes available in most modern vehicles. The option when purchased is activated when connecting the CAN cable over USB or wirelessly.

The option automatically reads our important data such as VIN number and status of the electronic units, when connected to a vehicle. DTC´s can be followed on a single service level or per ECU.



It is possible to read and clear DTC´s by dedicated buttons.

The J1979 diagnostic data can also be used as triggers to start and stop a recording, utilizing the same work flow as described earlier in the manual.

This concludes the basics of ViCANdroid. ViCANdroid can also be adapted to other situations, so if you have further inquiries, please contact your local Zuragon representative for advice.