Kvaser Memorator Setup Tool Example

This example will guide you through the creation of a useful configuration, engender two log files and help you to convert the logged files into different file formats for analysis. The example will also show you how to display a logged file in CANalyzer.

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1 Table of Contents

2 Example Overview

This guide will help you to create a configuration that contains two triggers that each for it self can start the logging with Kvaser Memorator, one stop trigger that as the name applies will stop the logging and four filters to be able to minimize the log files from any uninteresting CAN messages. Further on this guide will help you to extract and convert the created log files to four different file formats for analysis. We will also replay one of our logged files in CANalyzer.

3 Create Configuration

To begin with we will create the configuration. To be able to create the triggers and filters we will use the example database file that comes with the installation of Kvaser Memorator setup tool. Start Kvaser Memorator setup tool from the start menu on your computer. You will find the application at **Start | Programs | Kvaser Memorator | Kvaser Memorator Setup Tool**. Click at the *New* button at the toolbar of the application to be sure that you will start with a new and clean version.

3.1 Add Database file

To be able to create our triggers and filters we must have access to a number of CAN messages and signals. We will therefore add a database file to our configuration.

- Click at *Log Configuration* and then *Databases* in the tree view to the left in the application, see Figure 1.

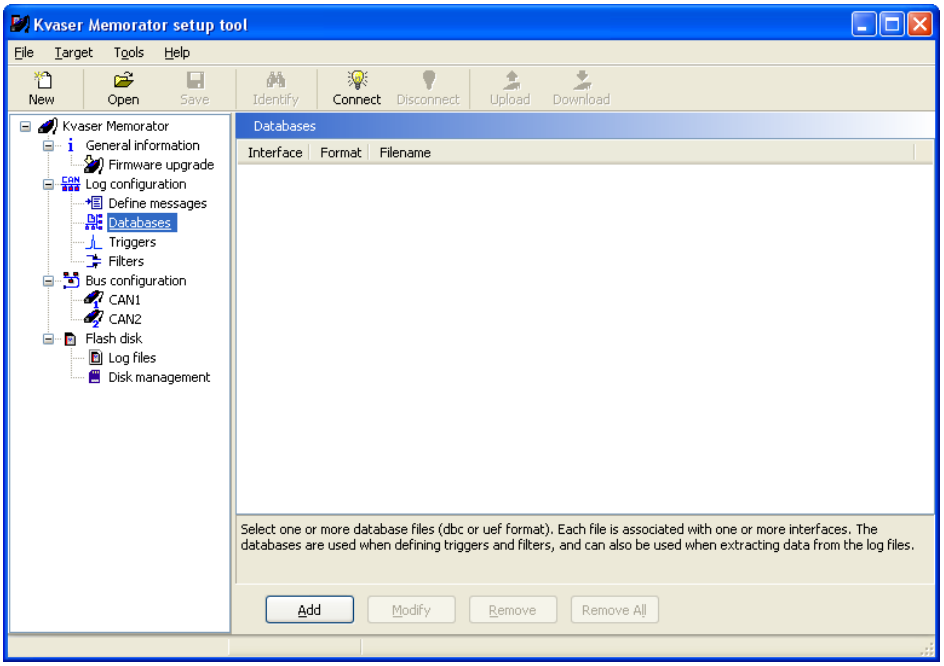

Figure 1. Databases.

- Click at the *Add* button. The *Select Database* window will be shown. See Figure 2.
- Click at the *Browse* button and browse to the Samples subdirectory in the directory where you installed the setup tool (which normally is C:\Program Files\KVASER\KvaConfigV2). Click at the file ExampleDatabase.dbc.
- Let the CAN Database (.dbc) box be checked.
- Check both of the CAN1 and CAN2 boxes.
- Click at the *OK* button.

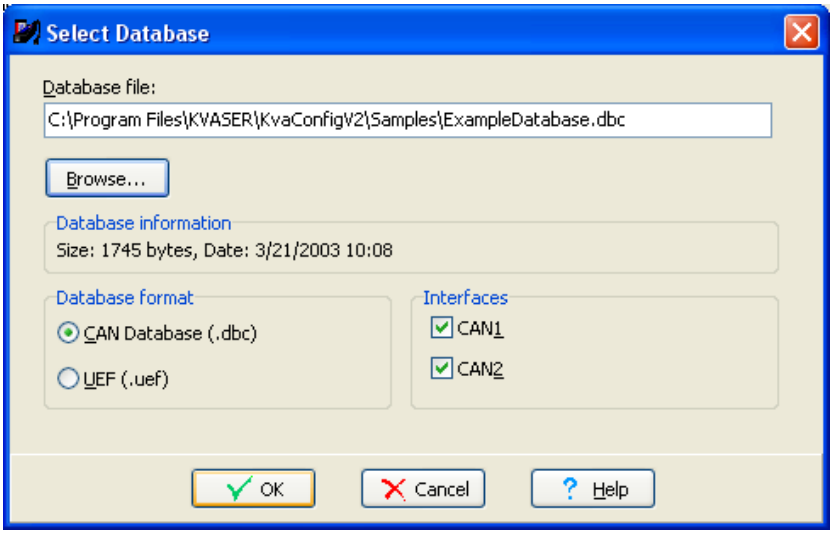

Figure 2. Add Database.

- You should now be able to see the added database file in the list of database files as shown in Figure 3 below.

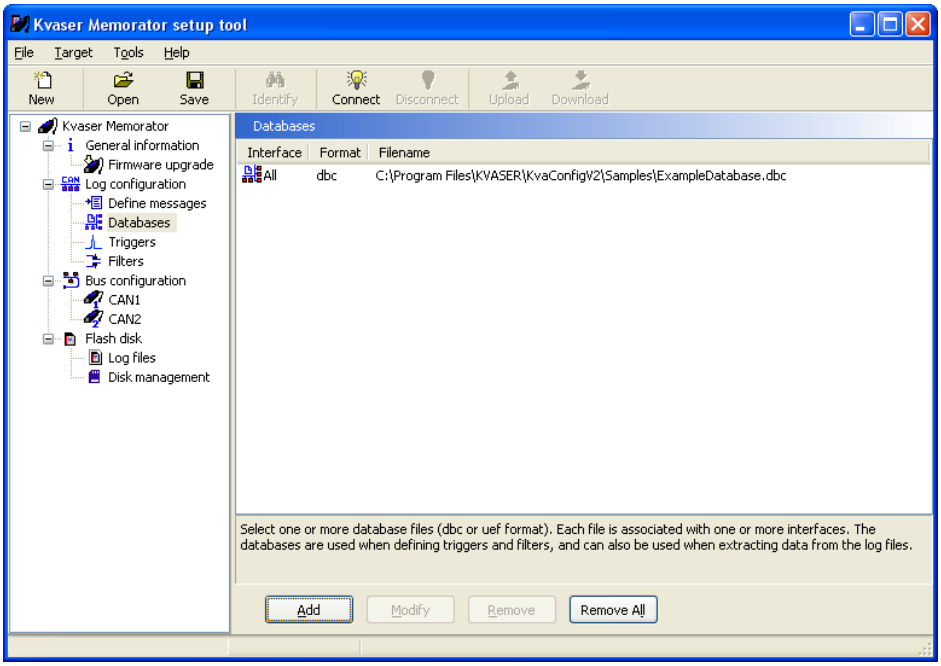

Figure 3 List of Databases.

3.2 Add Triggers

Now when the database file is added we can start to create our triggers. The first trigger should be a start trigger that will make Kvaser Memorator to start its logging when the signal door_pos's value becomes 1. The signal belongs to the message l_door with the identifier 0.

- Click at *Log Configuration* in the tree view and uncheck the *Log Everything* box. This should never be checked when using triggers.

- Click at *Triggers* under *Log Configuration* in the tree view.
- Click at the *Add* button. See Figure 4.

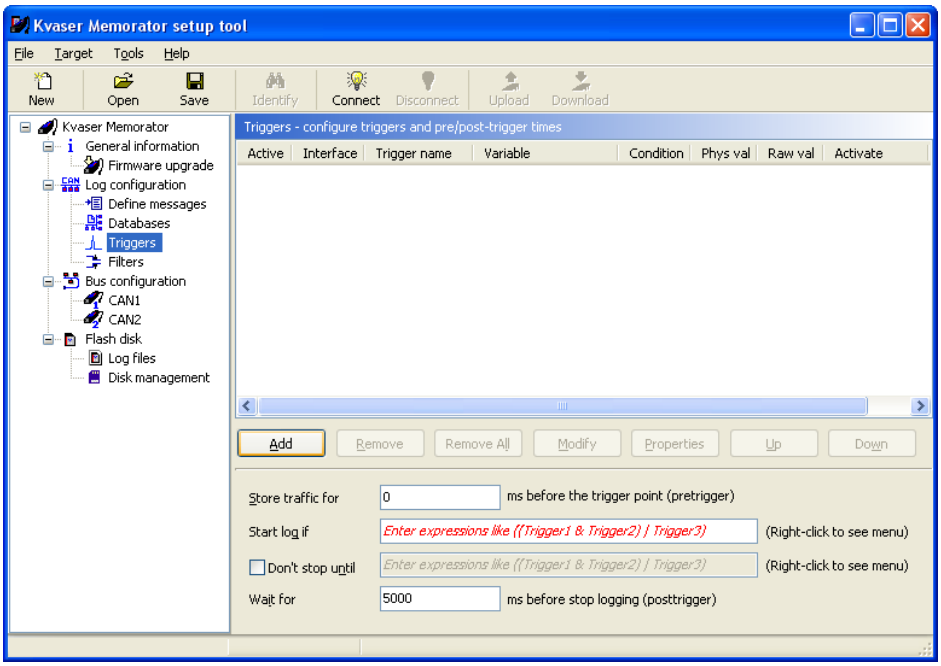

Figure 4 Triggers.

A wizard will be shown that will help you to add the trigger. See Figure 5.

- At the first page in the wizard you should change the name of the trigger from Trigger1 to Door_pos_left.
- Let Interface be *CAN1*.
- Protocol should be set to *None*. Click at the *Next* button.

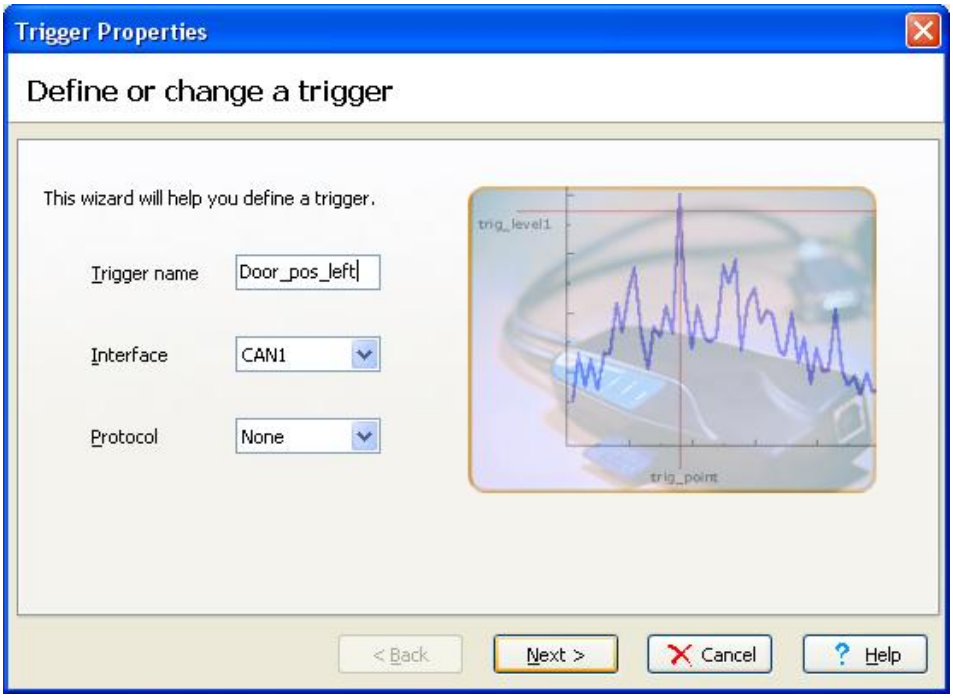

Figure 5. Add trigger.

At the second page we will define what the trigger should react on.

- Click at the *Select* button at *Trigger on the value of a signal in a CAN message*. See Figure 6.

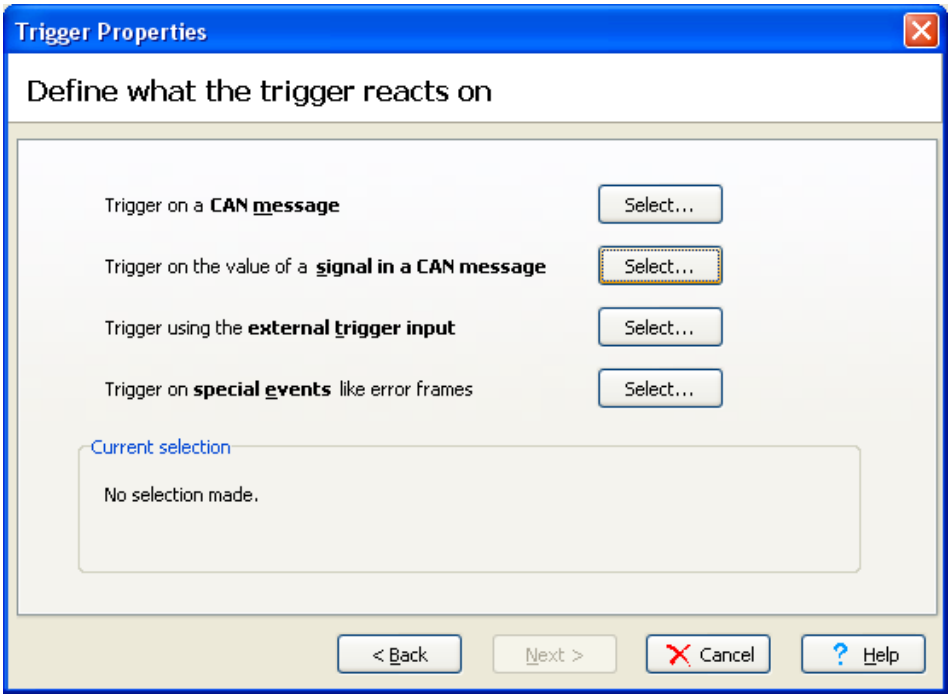

Figure 6. Define what the trigger reacts on.

- Choose the signal door_pos that belongs to the message l_door and click at the *OK* button. See Figure 7.
- Click at the *Next* button.

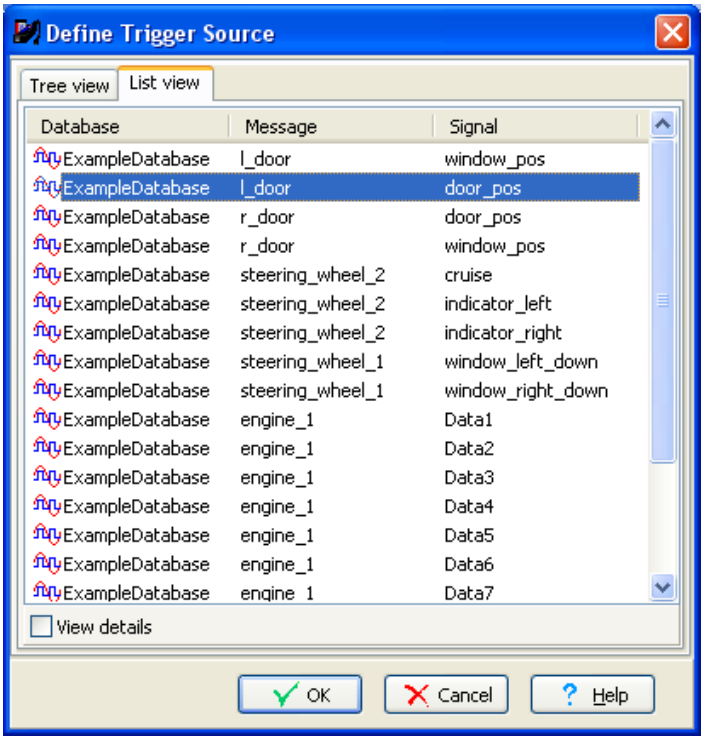

Figure 7. Define trigger source.

Since we have chosen a signal, we should define some conditions for the trigger. We want to start the logging when the value of our signal becomes 1.

- Enter 1 as value. See Figure 8. Watch out for hexadecimal and decimal adjustment. You can change the default setting for this at **File | Preferences**. Check or uncheck the *Use hexadecimal numbers where applicable* box depending on desired format.
- Let *Activate* be *on reception*.
- Click at the *Next* button.

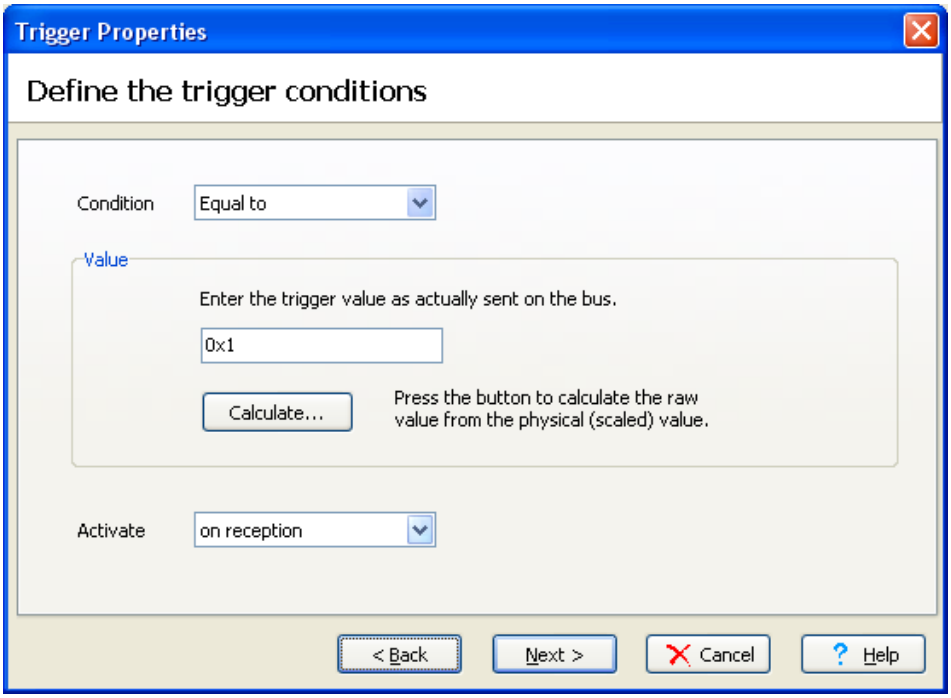

Figure 8. Define trigger conditions.

The wizard will now show your trigger setup. Compare your trigger setup with the one at Figure 9. It should be the same.

- Click at the *Finish* button.

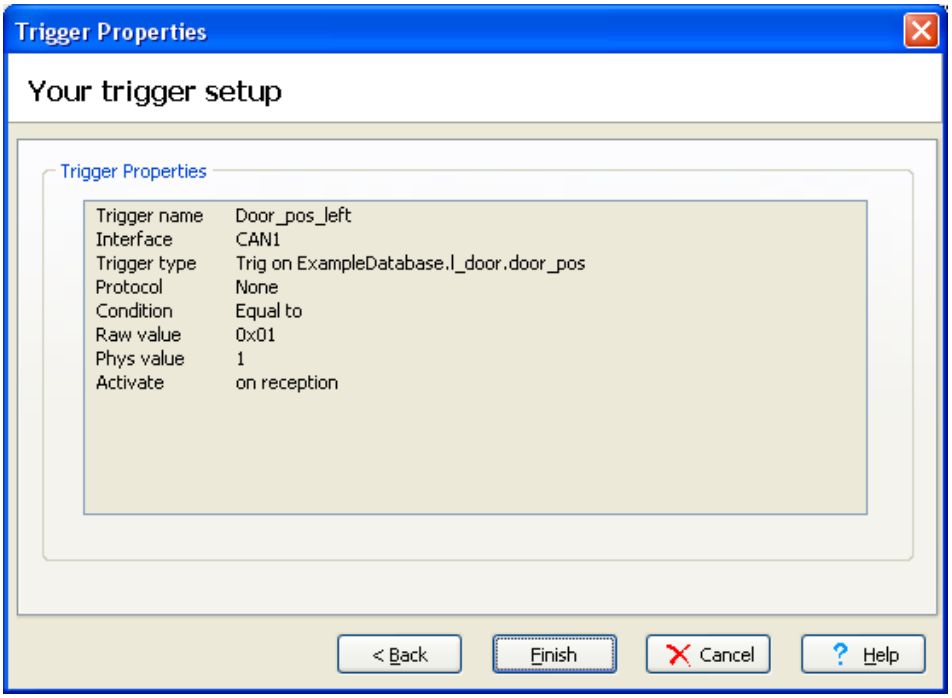

Figure 9. Trigger setup.

The trigger should be shown in the trigger list. Now it is time to add the second start trigger. This time we want Kvaser Memorator to start its logging when the message r_door with the identifier 1 is sent on the CAN bus.

- Click at the *Add* button once again.
- Name the trigger Door_msg_right.
- Click at the *Next* button on the wizard.
- Click at the *Select* button at *Trigger on CAN message* this time. Choose the message called r_door from the list view. Click at the *OK* button.
- Click at the *Next* button and then at the *Finnish* button.

You should now be able to see the two triggers in the trigger list as in the Figure 10 below.

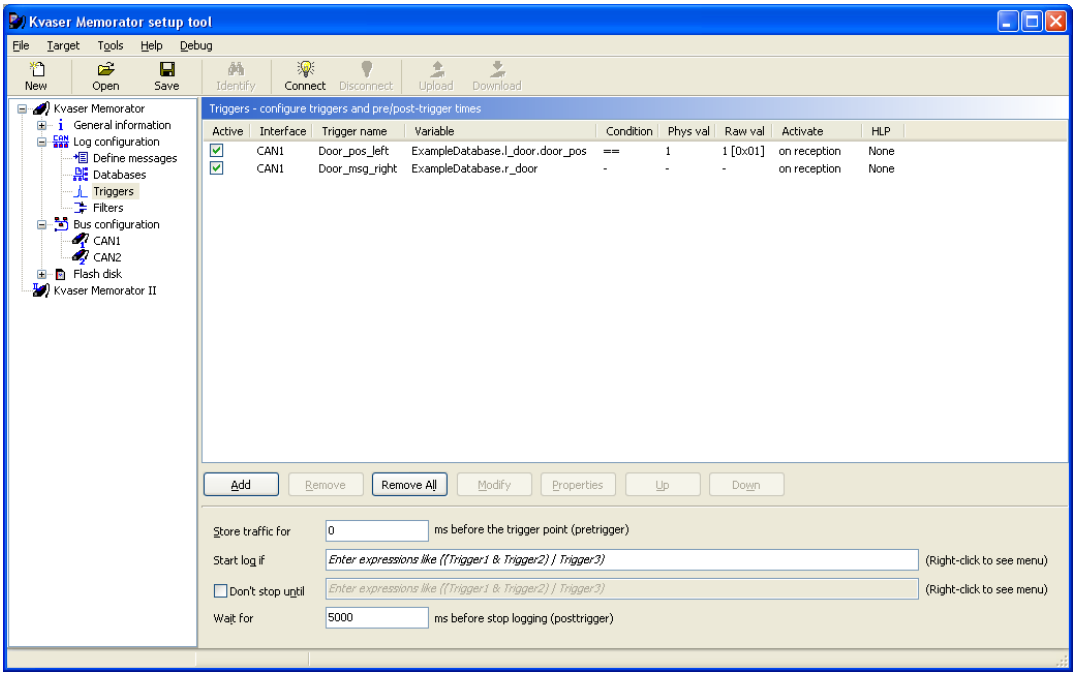

Figure 10. List of triggers.

Finally, we will add the trigger that should stop the logging.

- Click at the *Add* button again and name this trigger Engine.
- Click at the *Select* button beside *Trigger on a CAN message* as before at the *Define what the trigger reacts on* page in the wizard.
- Select the message *engine_1* in the list view.
- Click at the *OK* button.
- Click at the *Next* button in the wizard.
- After checking the Trigger setup page in the wizard, click at the *Finnish* button.

You should now be able to see our 3 triggers in the trigger list. The last settings to be made for the triggers are the pre and post trigger values and to write the start and stop trigger conditions.

- Write 3000 in *Store traffic for..* below the trigger list, which means that all CAN messages that we don't filter out will be logged in 3 seconds before our trigger becomes true. See Figure 11.
- At *Start log if* you should write: **Door_pos_left | Door_msg_right** as you can see in Figure 11. This means that Kvaser Memorator will start its logging if the condition for either *Door_pos_left* or *Door_msg_right* becomes true.
- Check the *Don't stop until* box and write: **Engine**. When this trigger comes true the logging will stop.

- Write 3000 at *Wait for..* See Figure 11. We want the logging to go on until 3000 milliseconds after we have received the stop trigger message.

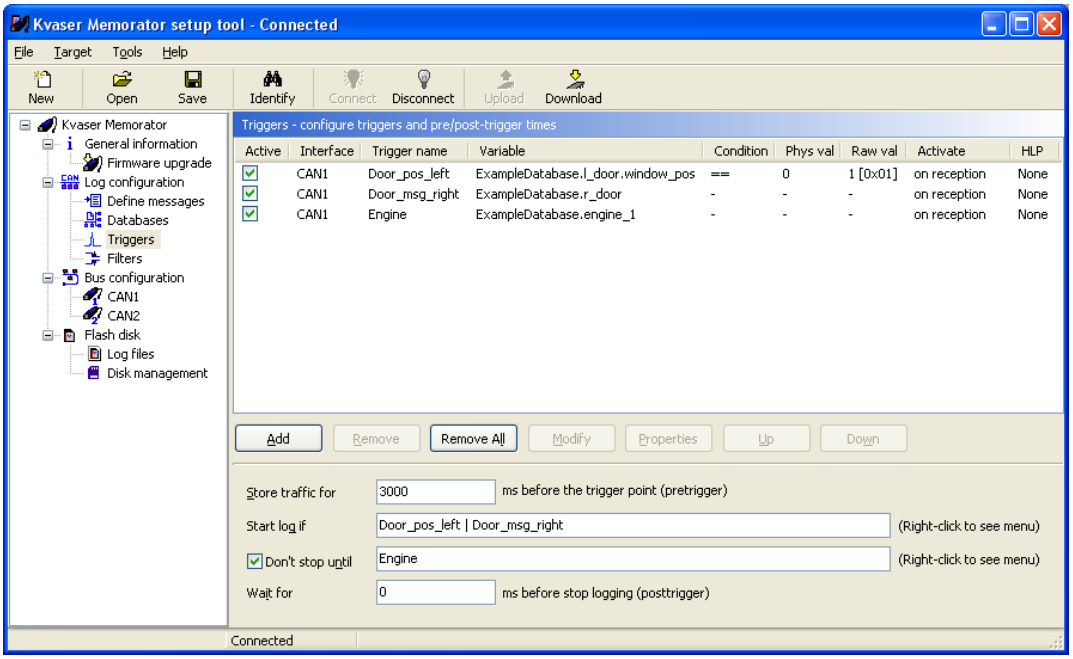

Figure 11. Trigger settings.

Now that our triggers are set, we are going to add the filters.

3.3 Add Filters

We will create four filters. It is important to understand that the filters are evaluated before the triggers, which means that the identifiers of our triggers must pass the filters otherwise the triggers will never come true.

- Click at *Log Configuration* in the tree view and then at *filters*. See Figure 12.

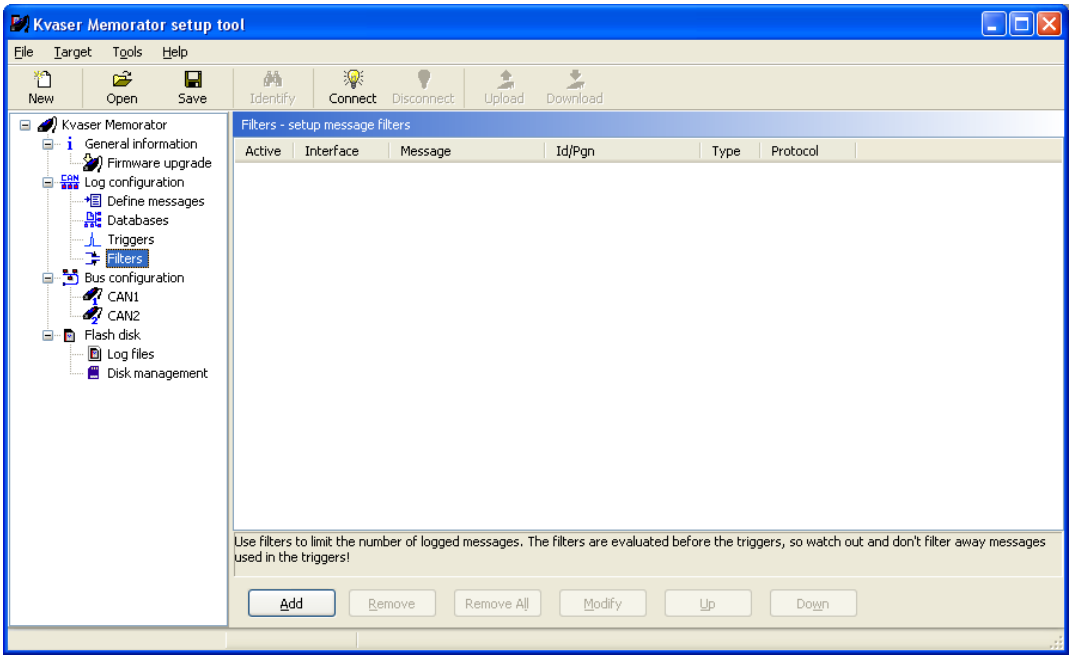

Figure 12. Filters.

- Click the *Add* button. A wizard will be shown and help you to define the first filter. See Figure 13.
- Let the CAN1 and CAN2 boxes be checked.
- Click at the *Next* button.

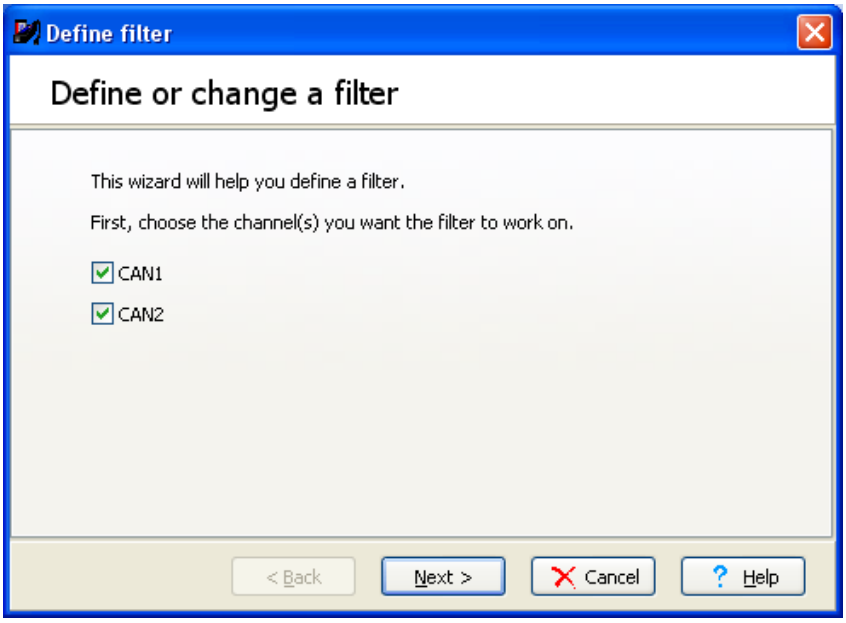

Figure 13. Define filter.

- Don't choose a higher layer protocol, just let the *None* box be checked. See Figure 14.

- Click at the *Next* button on the wizard.

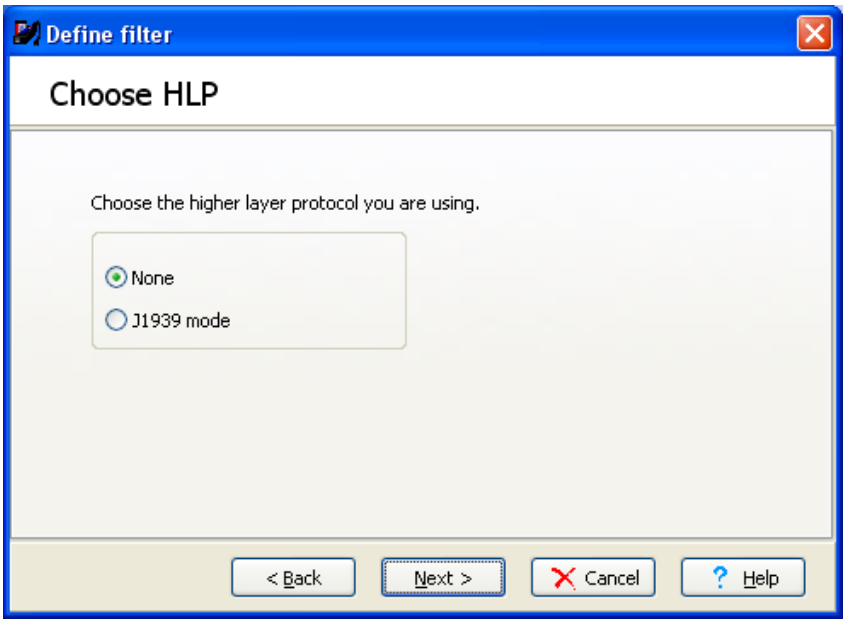

Figure 14. Choose HLP.

Now you will be able to see the messages from the database again in either a tree view or a list view.

- Click at the *l_door* message and click at the *Next* button. See Figure 15.

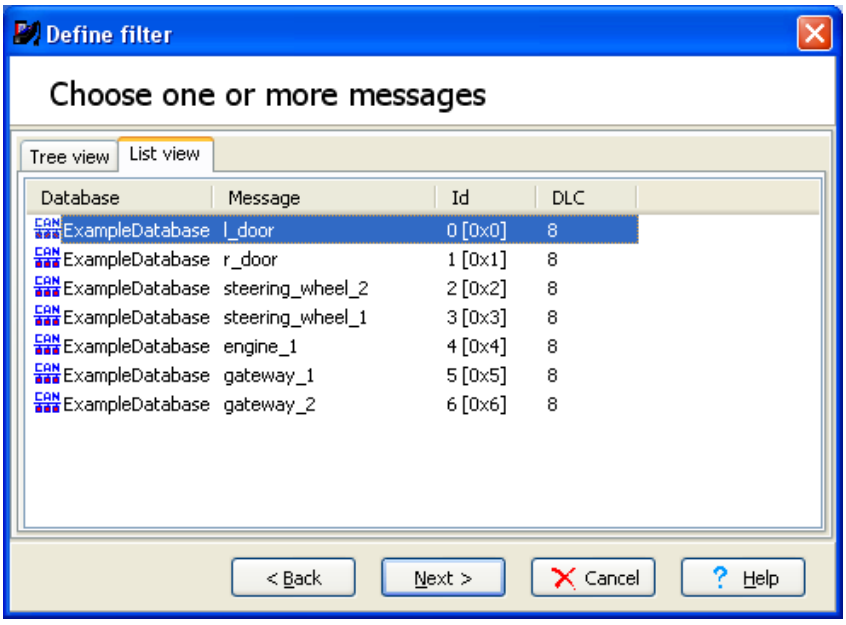

Figure 15. Choose message.

- Check the Pass filter box if not already checked. See Figure 16.
- Click at the *Finish* button.

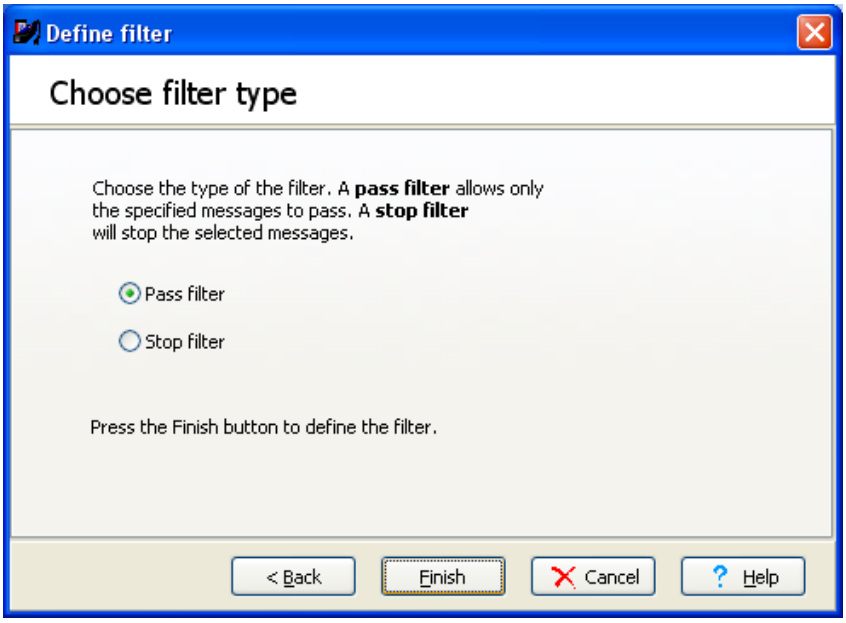

Figure 16. Choose filter type.

You should now be able to see the created filter in the filter list. See Figure 17.

- Create three more filters for the messages: r_door, engine_1 and gateway_1. You should then be able to see all four filters like in the filter list at Figure 17.

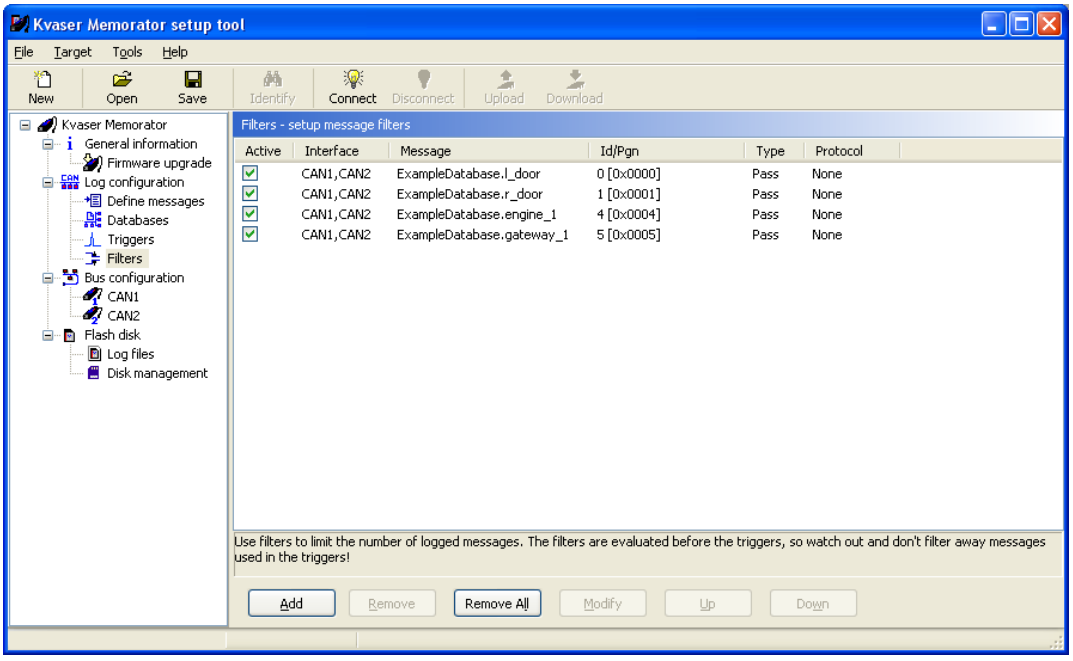

Figure 17. List of filters.

Now we are done with the triggers and filters.

3.4 CAN Channels Settings

To be able to log any traffic on the CAN bus, it is imported that Kvaser Memorator is configured with the same bit rate as all the other CAN equipment. In this example we have chosen to set the bit rate to 1 Mbit/second. Change this to fit your own CAN settings.

Click at *Bus configuration* and then *CAN1* in the tree view.

Let the *Enter bus parameters* box be checked.

Check the *1 Sample* box.

The bit rate 1 Mbit/second is set by default when you first start up Kvaser Memorator setup tool. Change the bit rate to 1Mbit/second if it is not already. See Figure 18.

Choose 1 at the *SJW* box.

Uncheck the *Silent Mode* box if Kvaser Memorator should be the only device connected to the CAN bus.

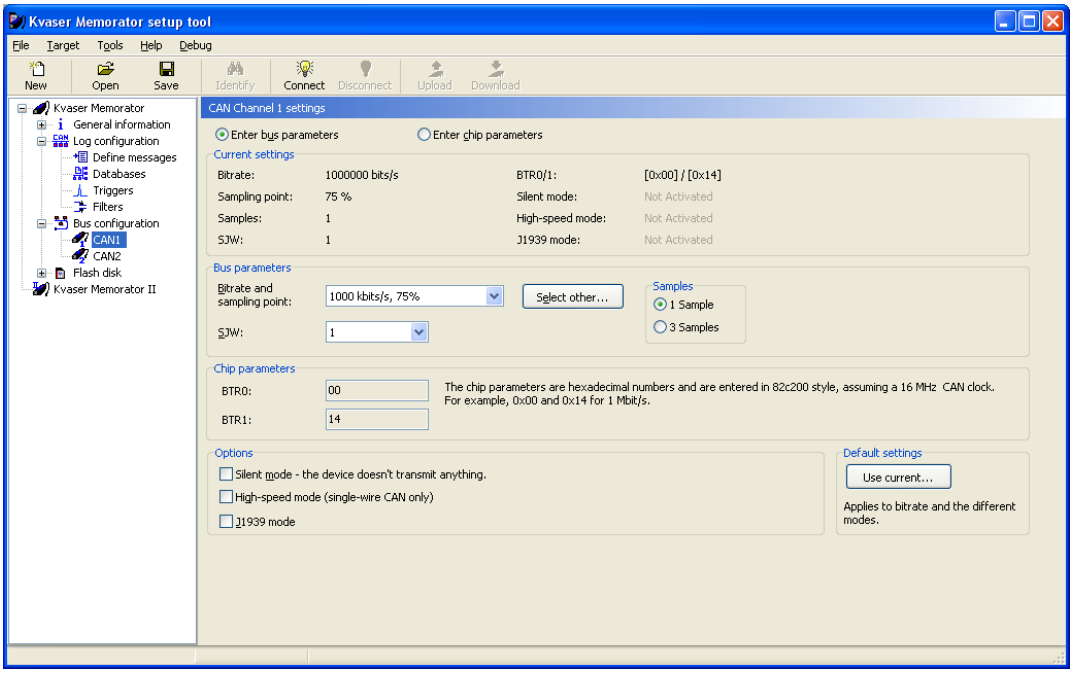

Figure 18. Bus configuration.

Now the settings for channel 1 are done. Make the same settings for channel 2.

Connect and Download

Now we are ready to download our configuration to Kvaser Memorator.

- Make sure that your Kvaser Memorator is connected via the USB cable to your computer. Read more about how to install and connect Kvaser Memorator in the *Getting Started Guide.pdf*.

- Click at the *Connect* button at the toolbar.

- A wizard to select the device to work with will be shown. See Figure 19.

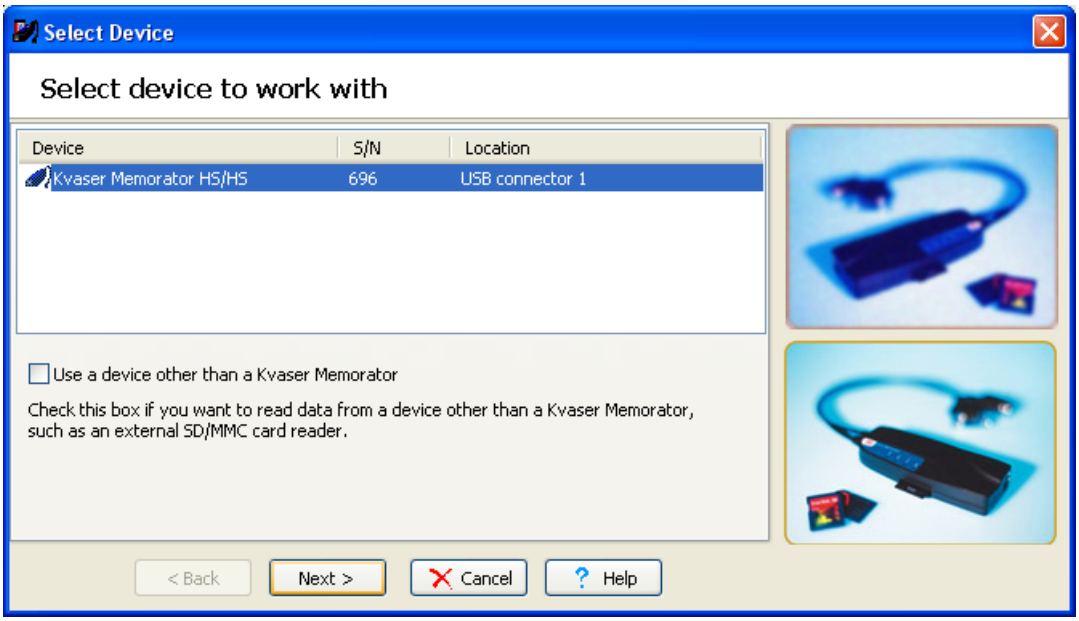

Figure 19. Connect.

- Click at the *Next* and then at the *Finish* button.
- You should now be able to see the LEDs on Kvaser Memorator flash in a running light pattern. The Connect button should be greyed and not clickable.
- Click at the *Download* button at the toolbar.
- Press yes at the question: Do you want to download the configuration? The old configuration will be overwritten.
- Now that the configuration is downloaded to Kvaser Memorator, it is time to start the logging.

4 Create the Log File

By using any kind of CAN analysing software you are able to send the messages that we have defined in our configuration. To be able to create one or more log files, you need to:

- Remove the USB connector from Kvaser Memorator before you can start logging.
- Connect Kvaser Memorator to a CAN bus where you are able to send the messages defined in the database file we have used. If you don't have the possibility to send the messages we are using, you will need to change your configuration to fit the messages you are able to receive.
- Read the *Getting Started Guide.pdf* to learn more about installation and cabling of Kvaser Memorator.
- Connect both channels on Kvaser Memorator to the CAN bus.
- When Kvaser Memorator is connected the green LED should start flashing slowly. If not, you may not have power connected to the CAN bus. Kvaser Memorator need power supply on its channel 1. Read more about this at the *Getting Started Guide.pdf.* Now Kvaser Memorator is ready to start the logging.

4.1 Start Sending Messages

We will send the message Gateway_1 periodically during the whole logging procedure. After a while we will send the start trigger message that will make Kvaser Memorator start to log. Some seconds later it is time to send the stop trigger message and after 3000 milliseconds Kvaser Memorator will stop the logging.

- Send the message Gateway_1 with the identifier 5 once every 100 millisecond. This message will pass our filter but will not cause Kvaser Memorator to start log. When one of our trigger conditions becomes true, Gateway_1 will be logged approximately 3000 milliseconds before the trigger condition came true. To be able to get a nice graph when analysing the logged files in for example ATI Apollo or CANalyzer, try to vary the first byte in the gateway message.
- Set the value of the signal dor_pos that belongs to the message called l_door with the identifier 0 to 1 and send it once.
- Kvaser Memorator should now start log and keep logging. You can see that it is logging by watching the green LED pwr that should be flashing quite fast while logging. The yellow LEDs CANI and CANII should be flashing once for every message that is sent on the bus.
- After some seconds, send the message engine_1 with the identifier 4 to stop the logging. The logging should stop and the green LED should stop flashing fast after approximately 3 seconds. The first log file is created.
- Keep sending the Gateway_1 message with identifier 5 every 100 milliseconds.
- Send the message called r_door with the identifier 1 once.

- Kvaser Memorator should now start to log and keep logging until we send the stop trigger message. You can see that it is logging by the green LED pwr that is flashing fast again.

- After a few seconds, send the message engine_1 with the identifier 4 to stop the logging. The logging should stop and the green LED should stop flashing fast after approximately 3 seconds. The second log file is created.

- We have created two log files. Now it is time to extract and convert these files to a readable format.

5 Extract and Convert the Log Files

To be able to view and analyse the two logged files we must extract and convert the files to a readable format. We have chosen to convert the logged files to Vector ASCII format and later replay the files in CANalyzer.

5.1 List the Log Files

Before we can extract and after that convert the log files, they have to be listed.

- Connect Kvaser Memorator to your computer by the USB cable again.
- Click at the *Connect* button at the toolbar and proceed as you did before.
- Click at *Flash disk* and then *Log files* at the tree view. See Figure 20.

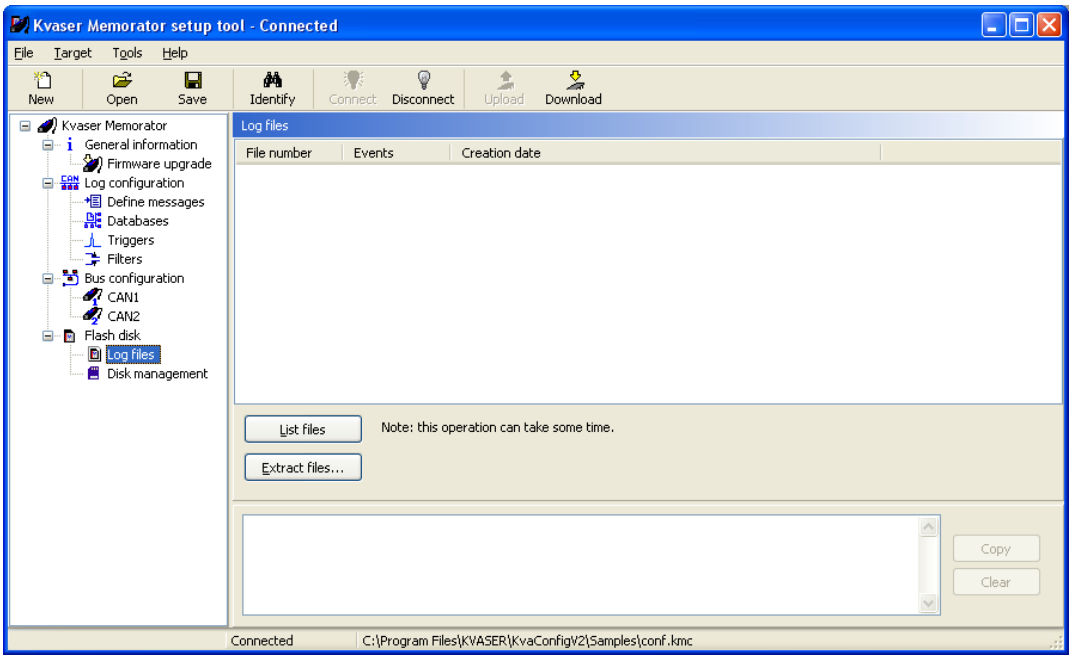

Figure 20. Log files.

- When connected, click at the *List files* button. See Figure 20.
- You should now be able to see the two log files in the list of files as in the Figure 21.

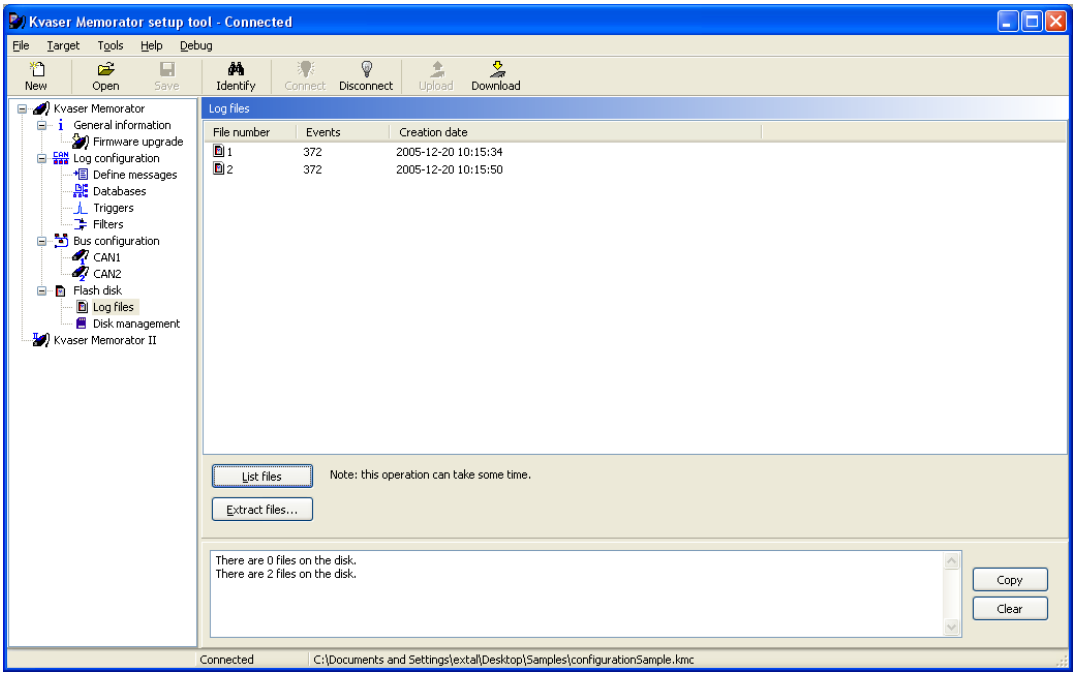

Figure 21. List files.

5.2 Extract and Convert

Now when the files are listed, its time to extract and convert the chosen log files to an analysable format.

- All files will be extracted by default if you do not mark any files in the list. If your disk contains more files than you want to extract, just mark the files by pressing the Ctrl button at the same time as you click at the files one by one.
- Click at the *Extract* button. A wizard will start and help you with the necessary steps to make a successful extraction of the two files. See Figure 22.
- The first thing to do is to browse to a place on your computer where you want the converted files to be saved and where you can find them again. We will place our files at the Samples subdirectory in the directory where you installed the setup tool (which normally is C:\Program Files\KVASER\KvaConfigV2). You can find our sample files that come with the installation in C:\Program Files\Kvaser\KvaConfigV2\doc\memo\Samples.
- Let the *Overwrite without warning* box be unchecked.
- Name the files doorSample at *File options.* See Figure 22.
- Click at the *Append creation date and time* box. This will add creation date and time of the files to the name doorSample as you can see in the *Sample file name* at the bottom of the wizard.
- Click at the *Next* button at the wizard.

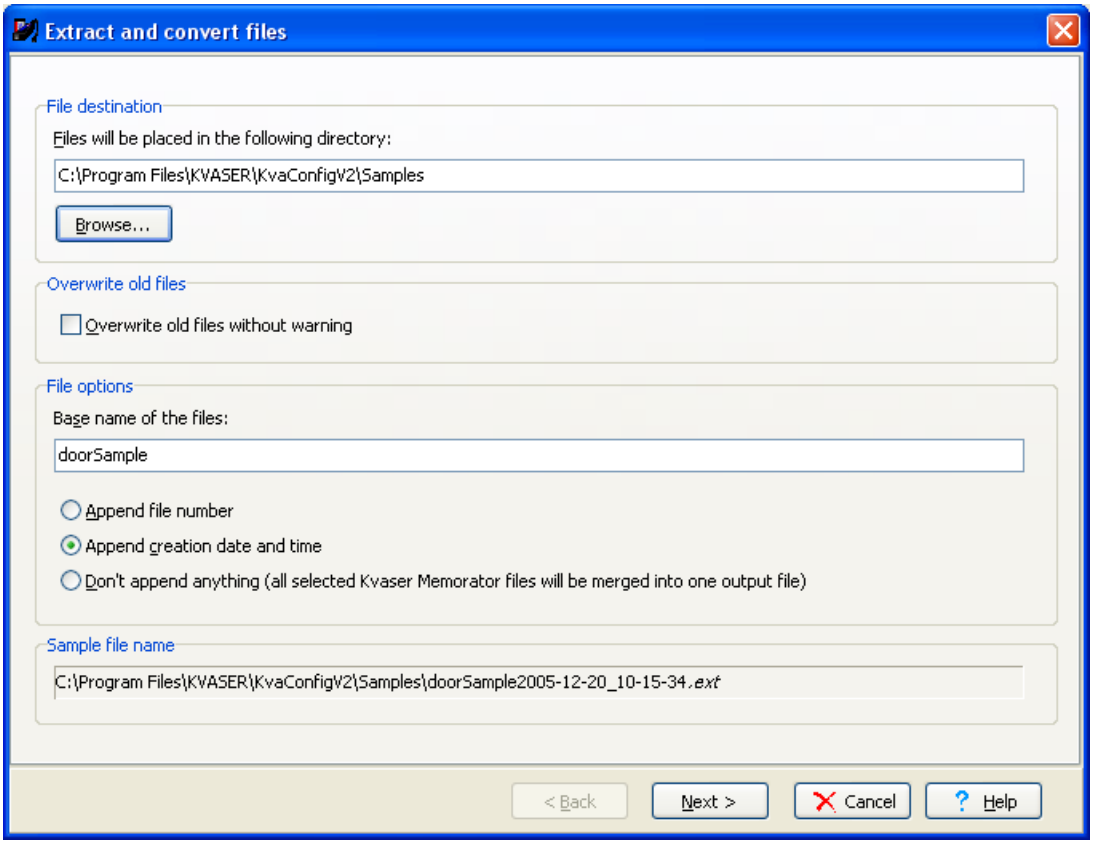

Figure 22. Extract and convert files.

- Check the *Vector ASCII format* box. This makes it possible to use the files in CANalyzer. See Figure 23.

- Click at the *Next* button at the wizard.

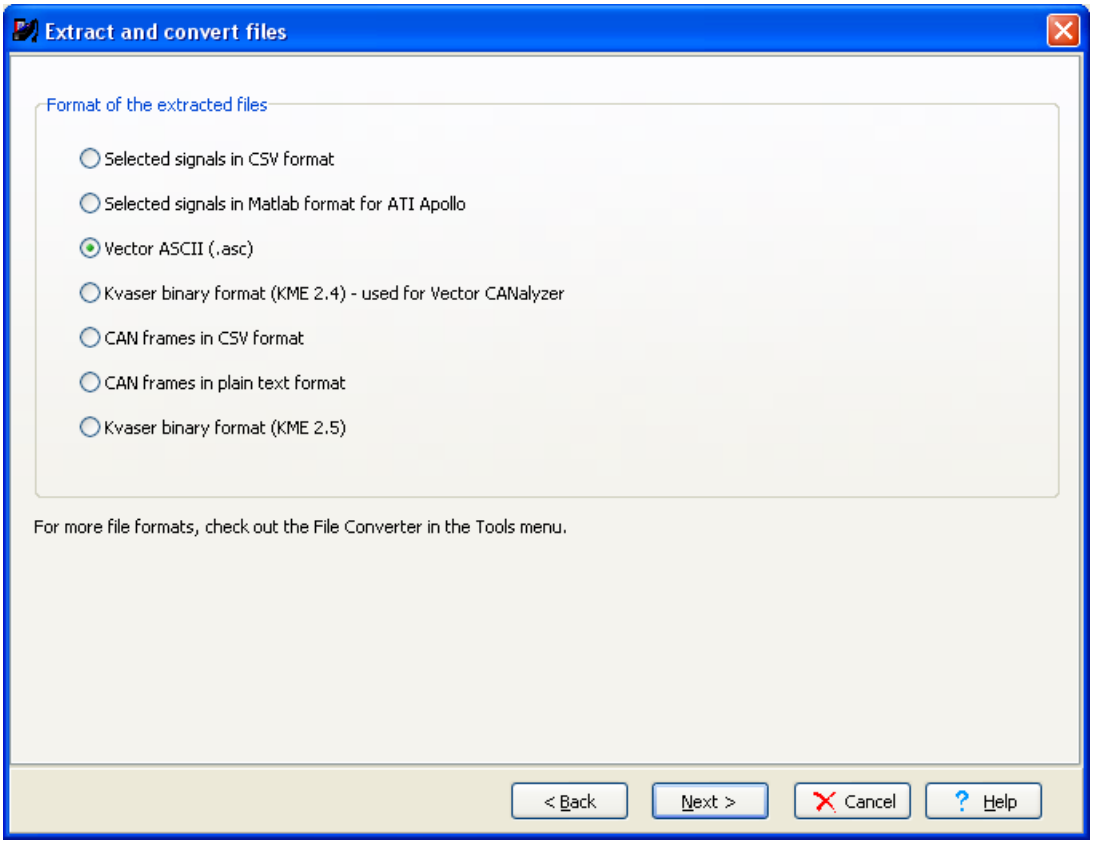

Figure 23. Choose format.

- Let the *Start of measurement* box be checked. See Figure 24.
- Let both channel boxes be checked at the *Extract from*.
- Check the *Write informational header* box to be able to view data like creation date and time.
- Click at the *Finnish* button.

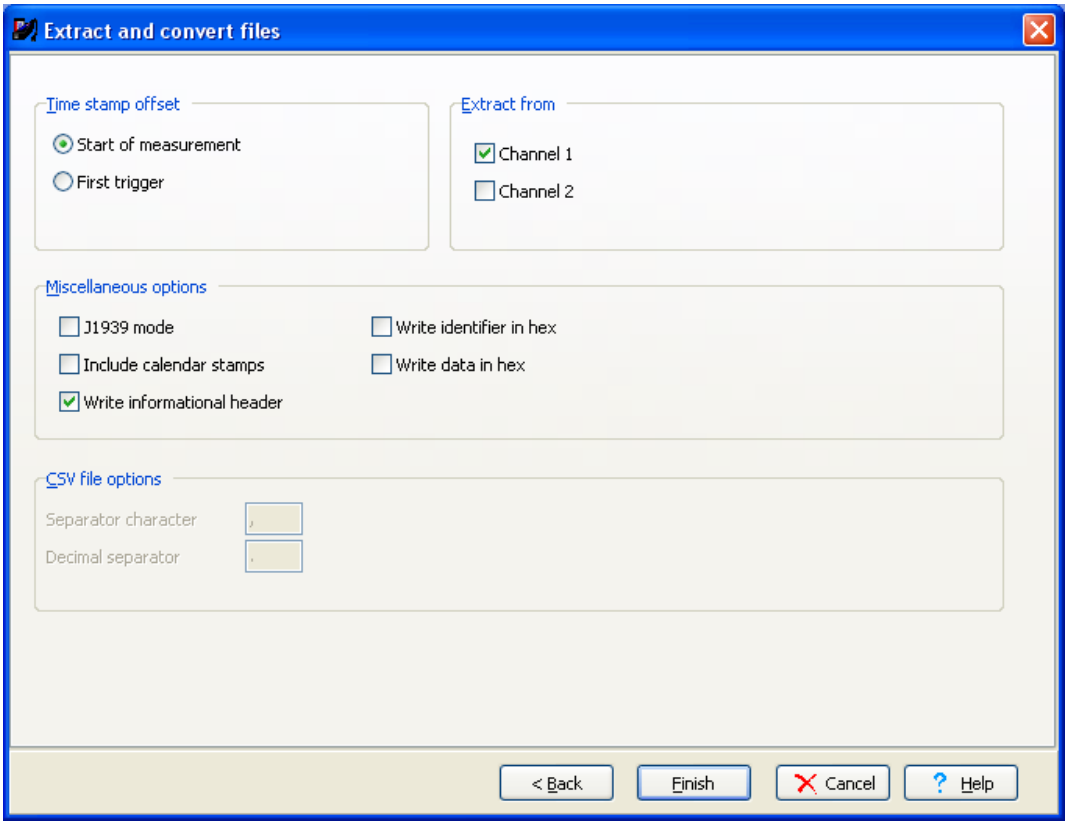

Figure 24. Other settings.

The files will now be extracted and converted to .asc format. At the message area at the bottom of Kvaser Memorator setup tool you will get information about each file. See Figure 25.

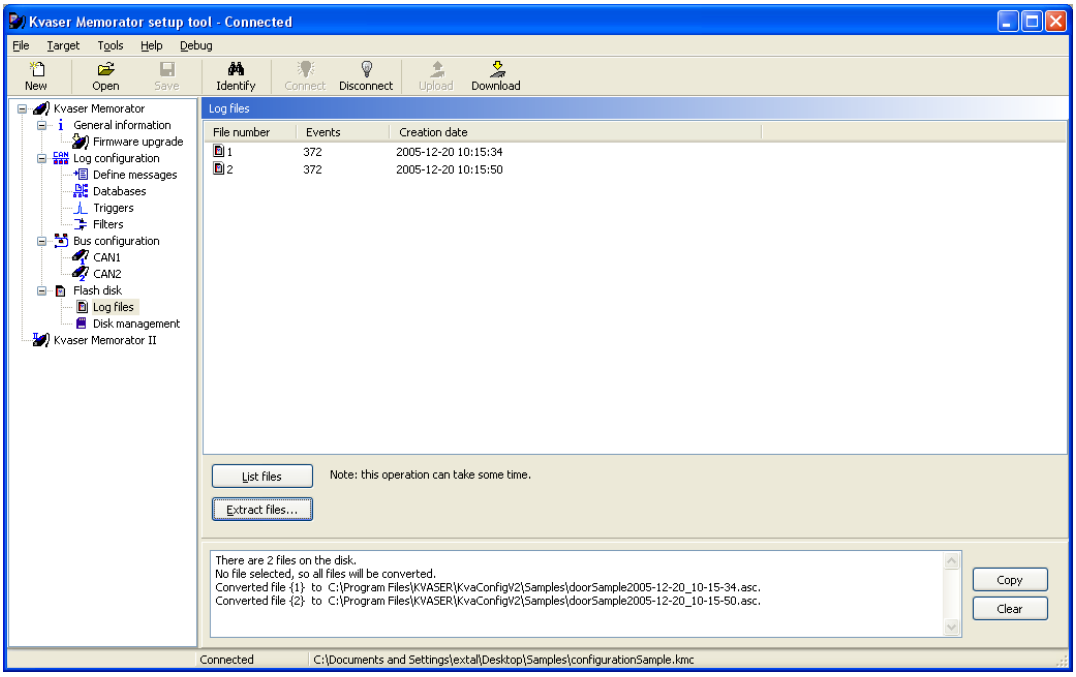

Figure 25. List of log files.

In Figure 26 below you can see part of the first sample file viewed in Notepad. The first trigger is the start trigger and the second is the stop trigger. In the middle we have removed some of the messages to make it possible to view both triggers in the same figure.

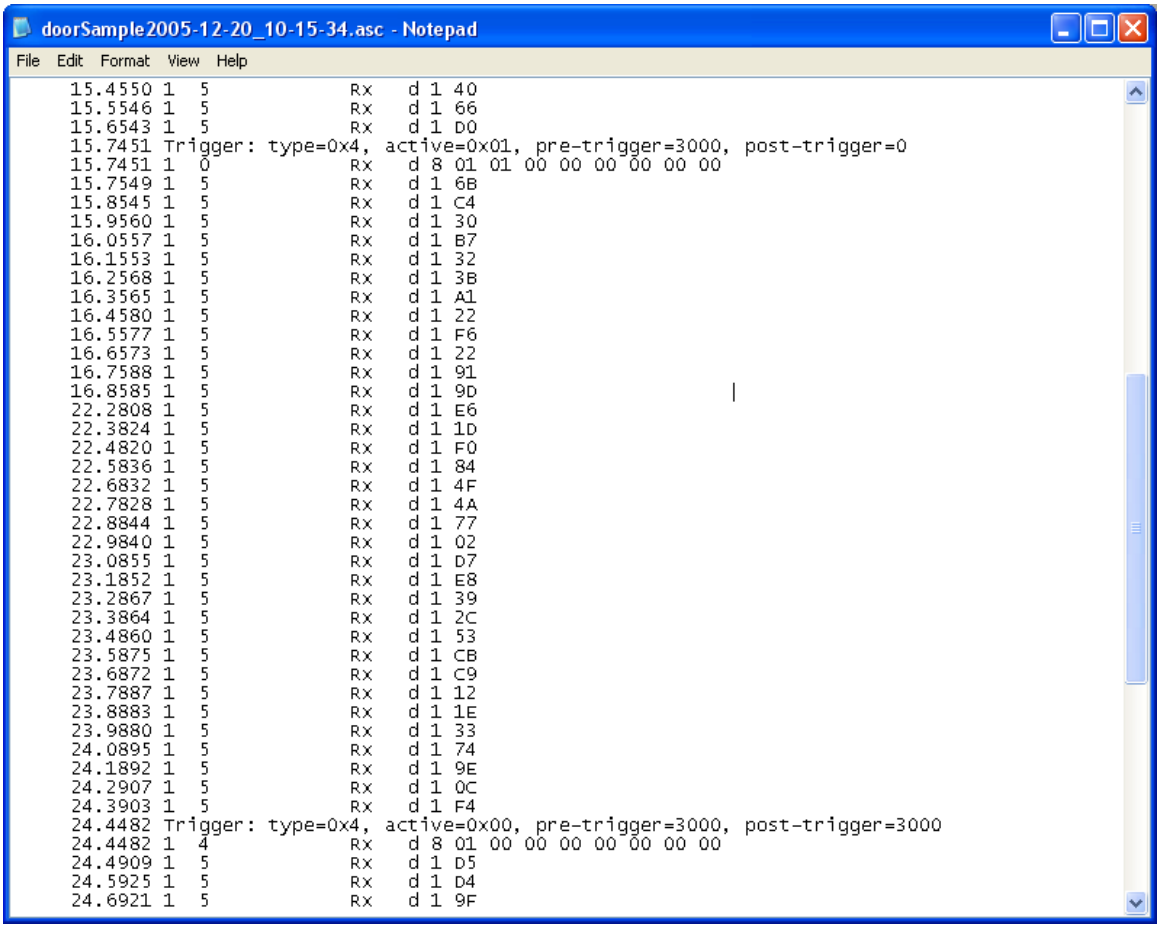

Figure 26. Start and stop trigger.

In the sample folder that comes with the installation of Kvaser Memorator setup tool you can also find the two logged files converted to other file formats.

- The files *doorSample2005-12-20_10-15-34.mat* and *doorSample2005-12-20_10-15-50.mat* can be opened and analysed in Matlab and ATI Apollo.
- The files *doorSample2005-12-20_10-15-34.txt* and *doorSample2005-12-20_10-15-50.txt* can be opened and analysed in a text editor.
- The files doorSample2005-12-20_10-15-34.csv and doorSample2005-12-20_10-15-50.csv can be opened and analysed in Microsoft Excel.

6 Analyse logged files in CANalyzer

In this part of the example we will show you how to use the files logged by Kvaser Memorator in CANalyzer. We will analyse the file *doorSample2005-12-20_10-15-50.asc* by connecting it to a replay block and reproduce the messages and signals that was sent on the CAN bus. A graph window will display the logged signals.

- Start CANalyzer and create a new clean configuration. See Figure 27.

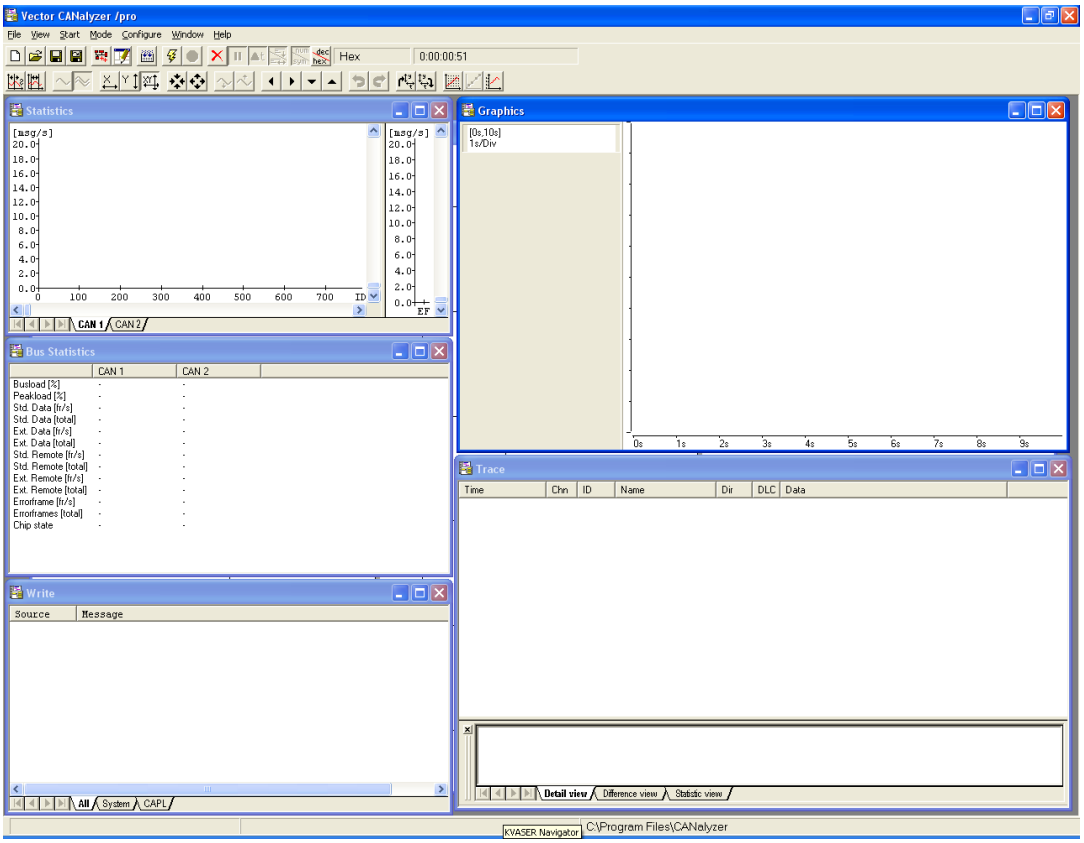

Figure 27. New configuration in CANalyzer.

- Click at **Window | Measurement Setup** to open the measurement setup window. See Figure 28.
- Right click at the square right above the send block and then click at *Insert replay block* in the menu.
- Double click at the inserted replay block.

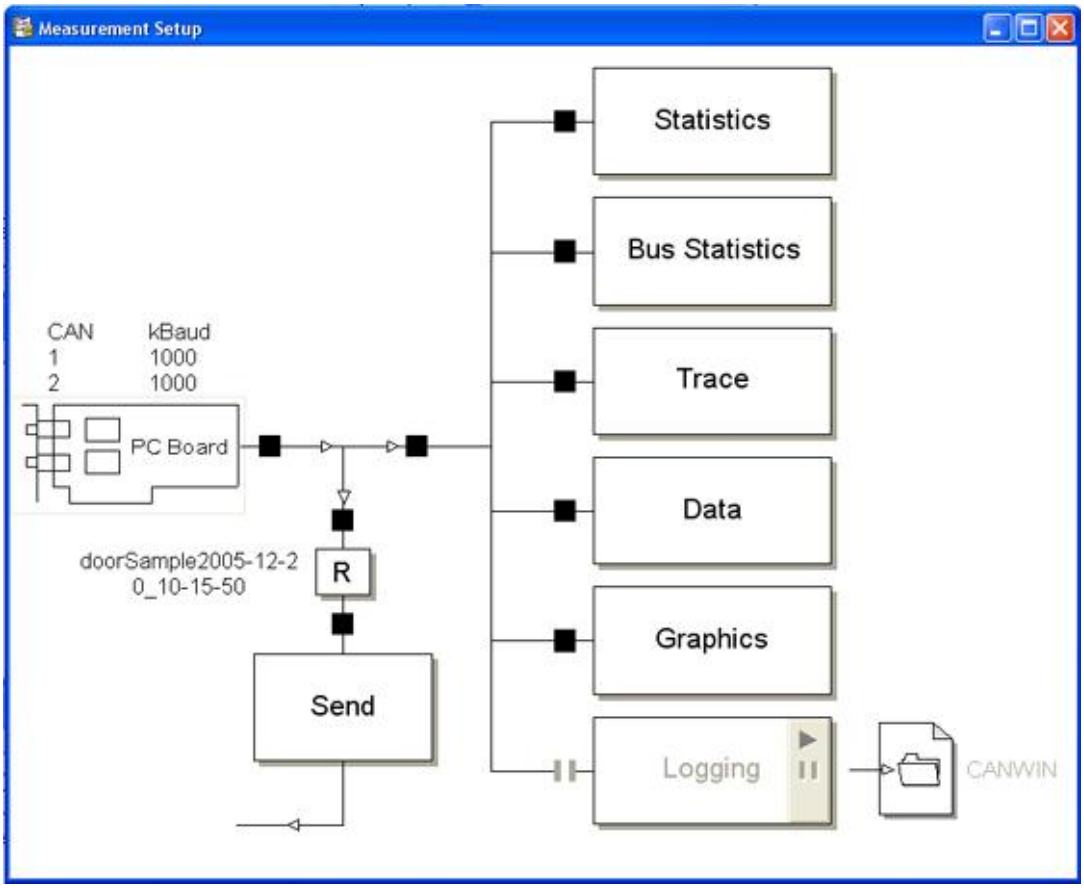

Figure 28. Measurement setup.

- Write DoorSampleReplay at *replay name.* See Figure 29.
- Browse to the location where the log files are placed and choose the file *doorSample2005-12-20_10-15-50.asc.* See Figure 29.
- Close the replay configuration window.
- Double click at the PC Board at the measurement setup window and change *baudrate* to 1000 kbit/second.

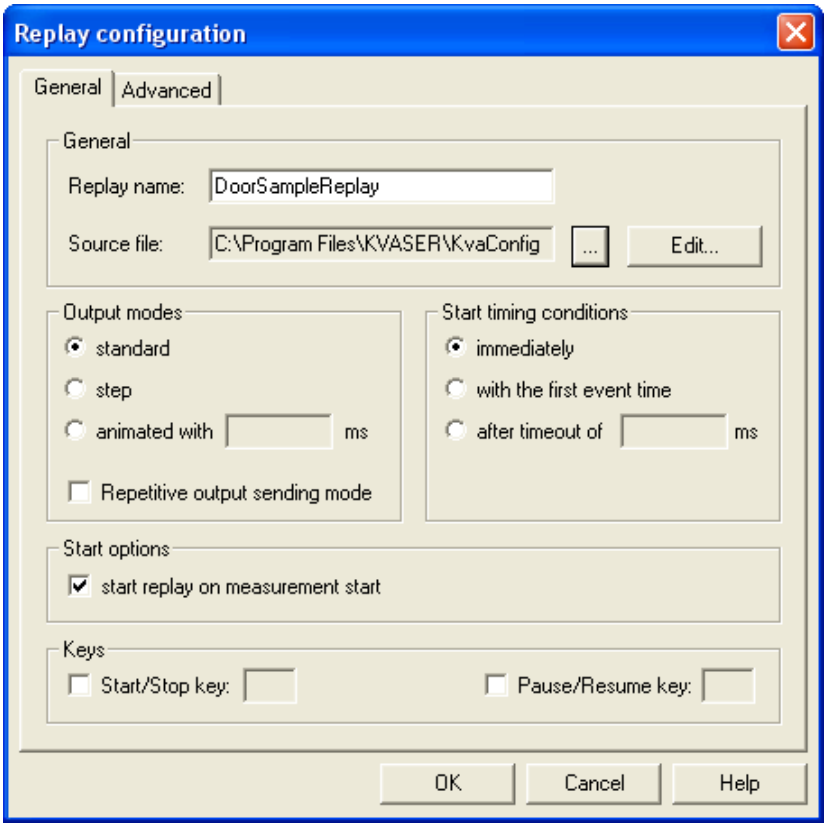

Figure 29. Replay configuration.

- Right click at the graph block in the measurement setup window.
- Click at *Configuration* in the menu. The *signal selection* window will be opened.
- Click at the *Define* button in the *signal selection* window.
- Write 5 at message ID. See Figure 30.
- Name the signal Gateway.
- Click at the *OK* button.

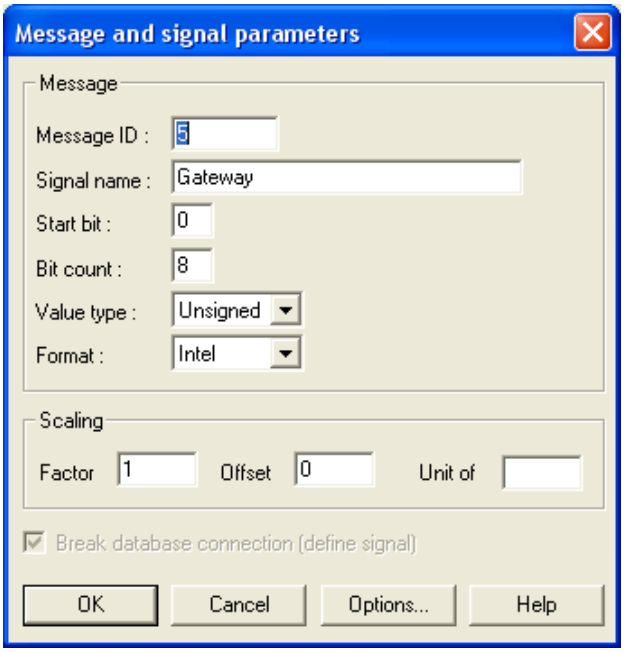

Figure 30. Message and signal parameters.

- Define three more signals and name them; Engine with ID=4, Door_msg_right with ID=1 and Door_pos_left with ID=0 as in Figure 31.
- Click the *OK* button.

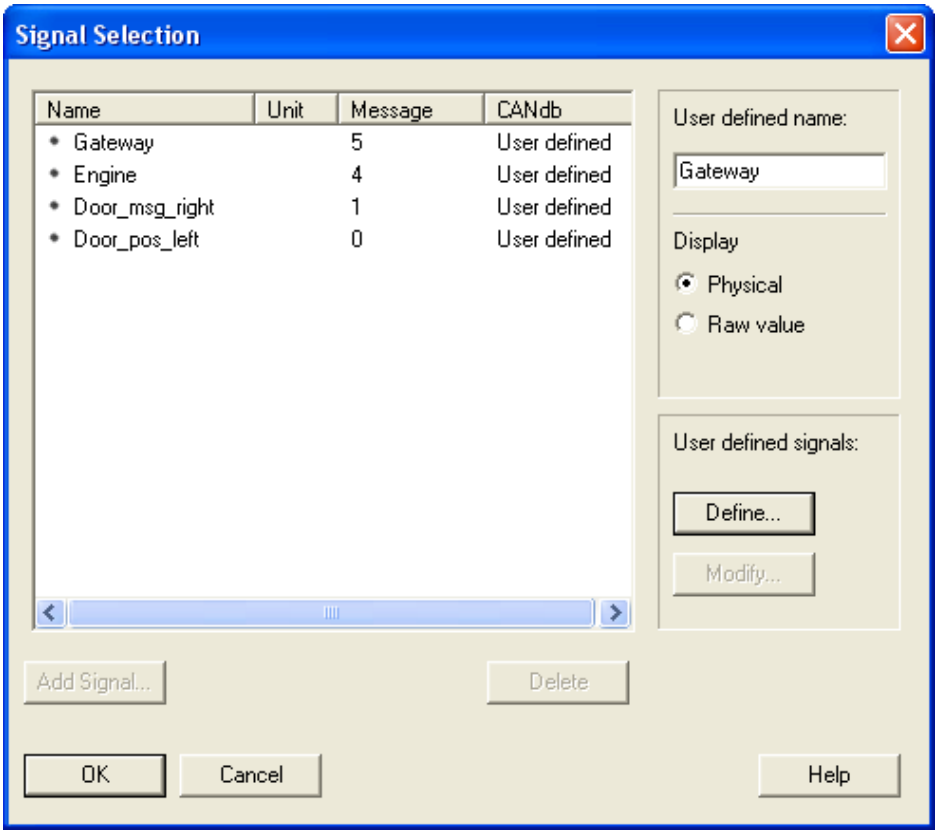

Figure 31. Signal selection window.

- Click at the *start measurement* button at the main menu bar of buttons.

Figure 32 below displays how the logged file *doorSample2005-12-20_10-15-50.asc* can be viewed and analysed in CANalyzer.

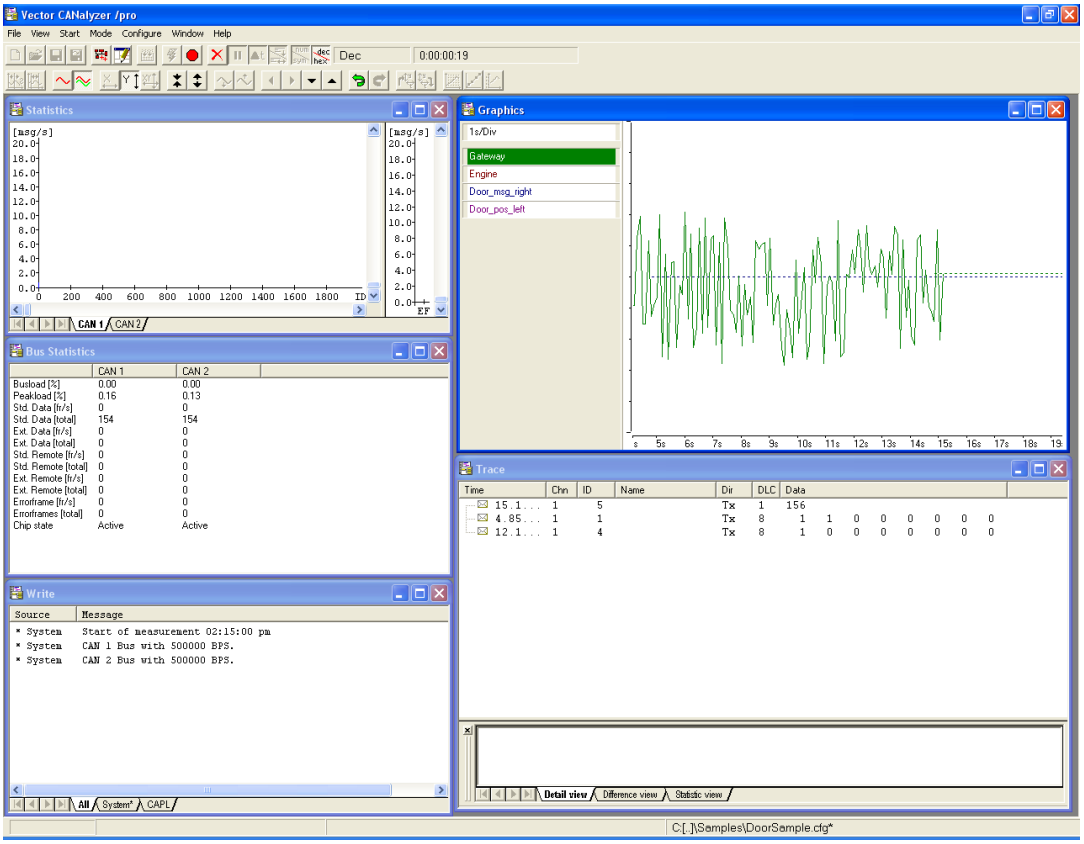

Figure 32. Replay in CANalyzer.

Hope this example has given you a good hint on how to use and get the most out of the Kvaser Memorator suite and of course, don't hesitate to contact our support for further questions.

7 Document revision history

Revision	Date	Changes
1	2006	Original revision
2	2006-11-13	Reviewed, new layout.