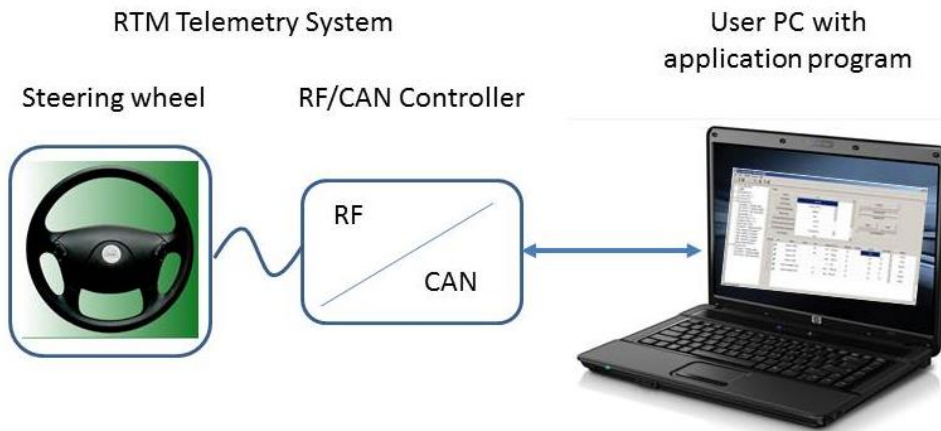


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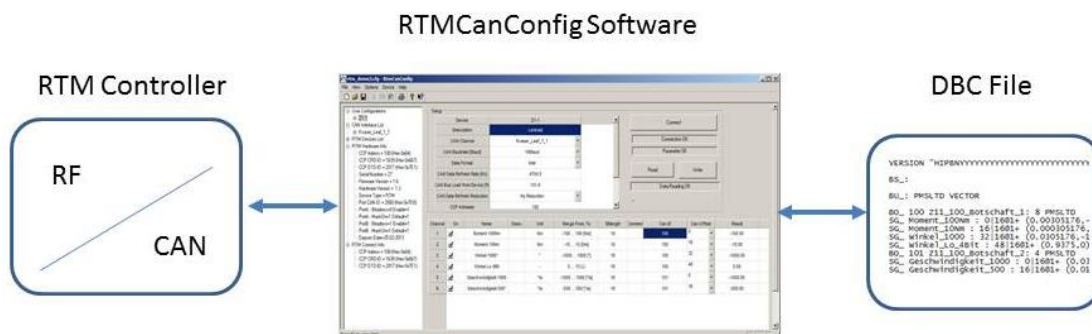
This manual describes the RTMCanConfig application program, which is used to configure a RTM (Rainer Thomas Messtechnik) telemetry system, such as a steering wheel. The RTM Controller receives the telemetry data and communicates via CAN bus with the PC.



RTMCanConfig is a 32-bit Windows PC software, which communicates via the CAN bus.

- Configuration of the measuring channels of an RTM telemetry system
- Administration of various user configurations and models of measuring devices, using a tree structure
- Display of the current measurement data, received from the CAN bus

The RTM telemetry system transmits continuously all its measuring channels to the CAN controller. The measuring channels are assigned to the CAN messages through the user configuration menu. The configuration parameters define the CAN Identifier, the bit position and the enabling of all measuring channels. The data reduction factor describes a method for transmitting only a smaller part of the data, avoiding a bus overflow. The CAN bus configuration can be saved in a CAN-Dbc-File for use in other programs for formatting the received CAN data.



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After power-up, an RTM telemetry system will transmit its data on the CAN bus. The RTMCanConfig program displays the received CAN messages in the main window, within the "Measurement values" column in the table of measuring channels, together with the CAN identifier and the CAN offset. The values are displayed as floating-point numbers, scaled according to the measuring range, or as integers in decimal or HEX format.

The RTMCanConfig program can administrate various user configurations. The last selected configuration will be the active configuration, and its parameters and data are displayed in the two tables in the main window

The RTMCanConfig program supports the CAN/USB Hardware from VECTOR or KVASER.

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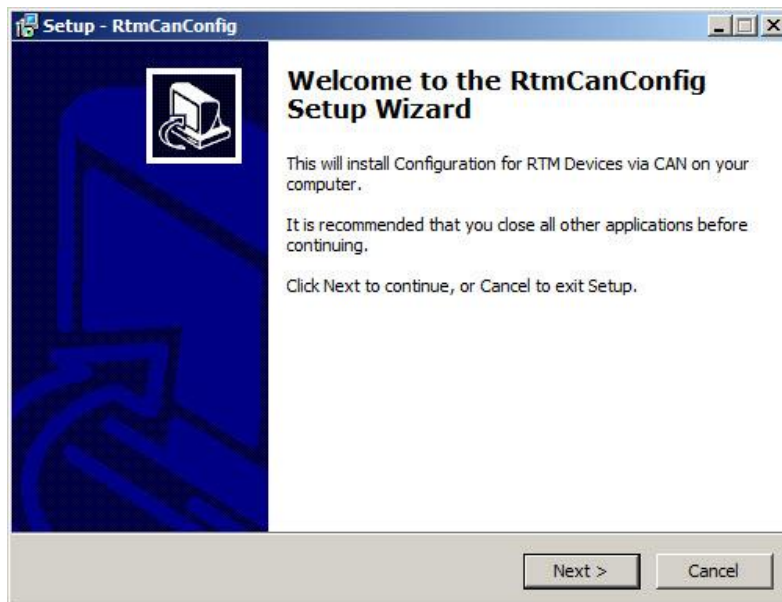
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Installing the Program

You will find the installation file for RTMCANCONFIG in the ZIP file "Installer_RTMCANConfig.Zip". The ZIP file contains the "RtmCanConfig_Installer.exe" file. After starting the first installation window will appear:



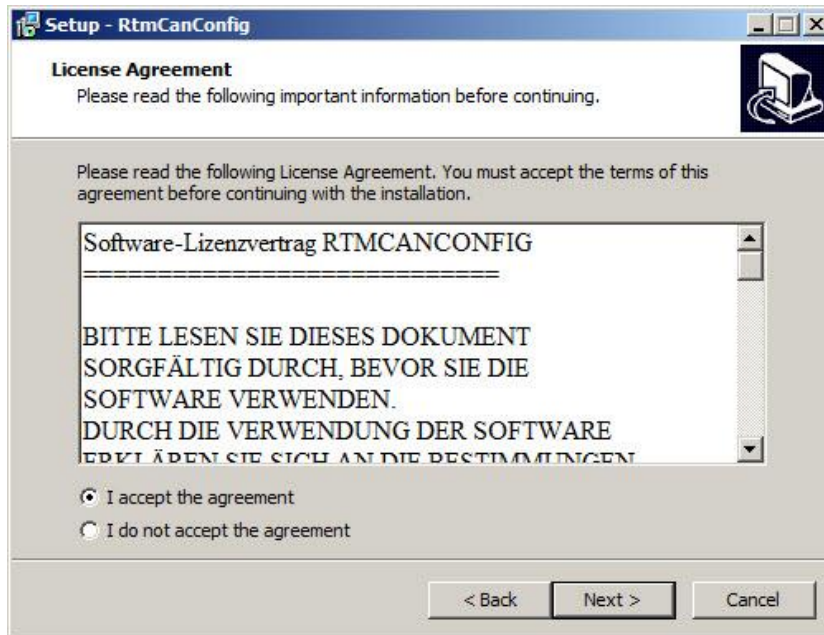
You can select the installation language as English or German. Click "OK" to proceed.



Please close all other applications before proceeding with the setup procedure. Click "Next" to proceed, or "Cancel" to exit.

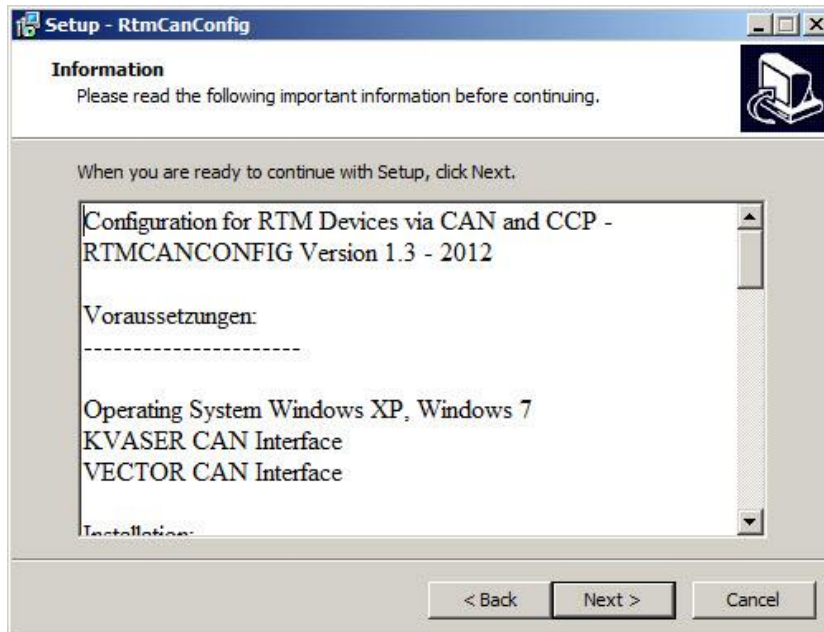
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License Agreement



Please read the License Agreement information, agree to the terms of license, then click "Next".

Information

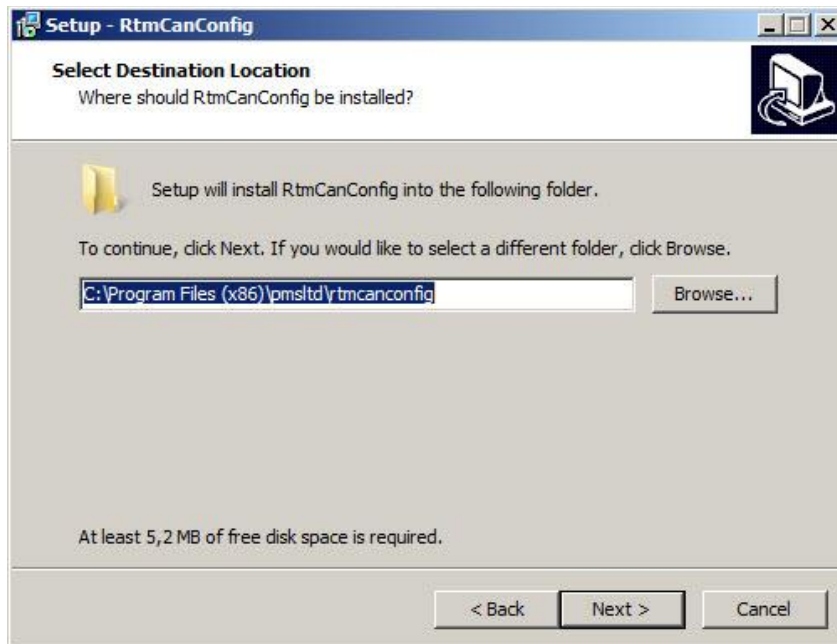


Click "Next" to proceed.

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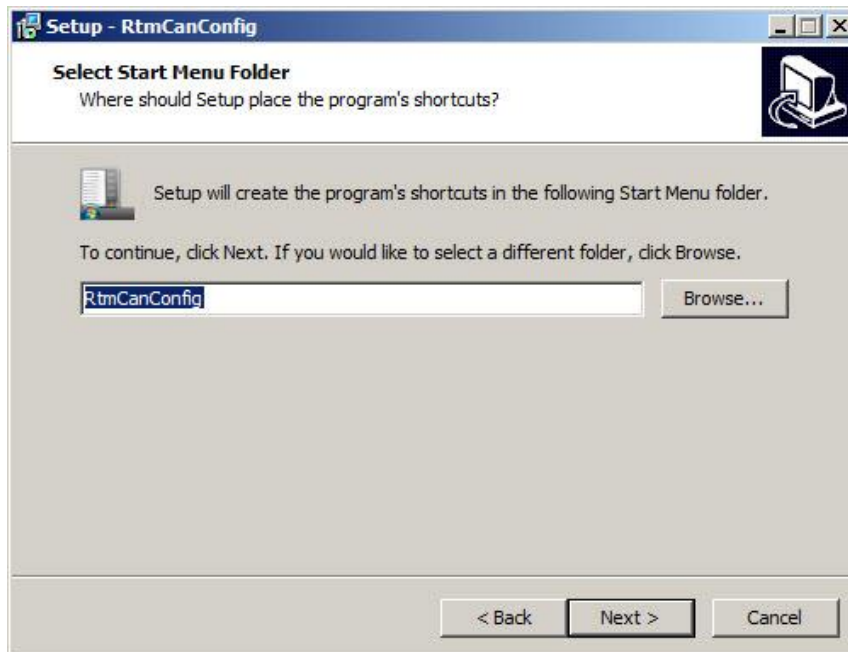
Destination Location

In the following windows you will be prompted for the installation folder. Per default, the program will be installed into the "C:\Program Files\Pmsltd\RtmCanConfig" folder.



Click "Next" to proceed.

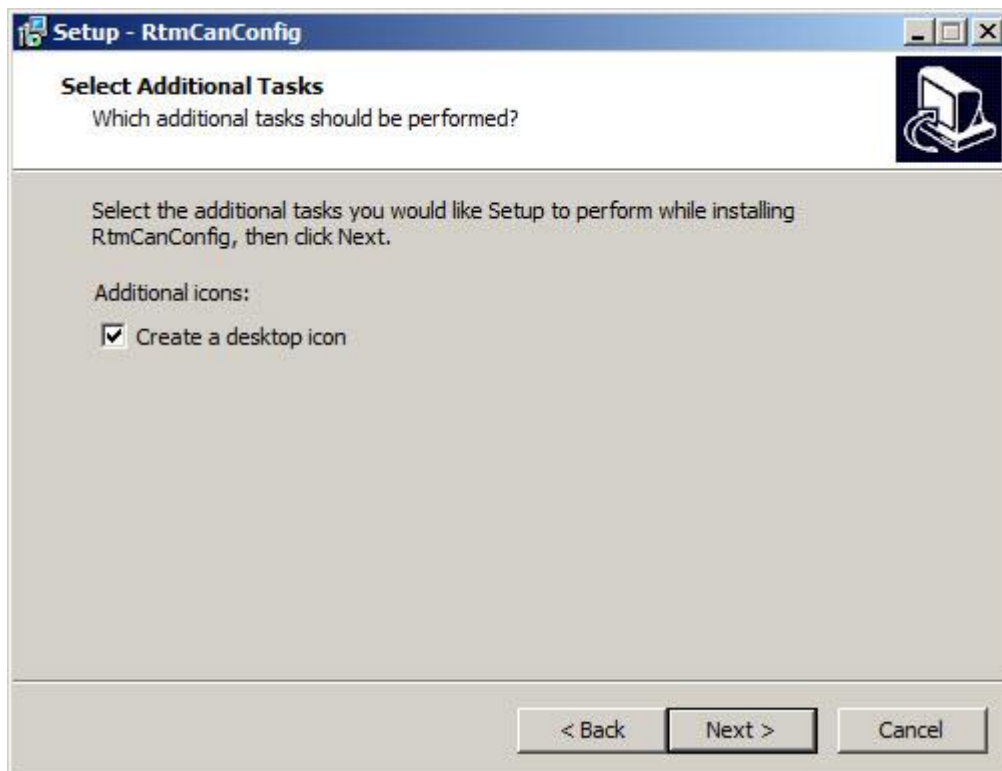
Start Menu



Click "Next" to proceed.

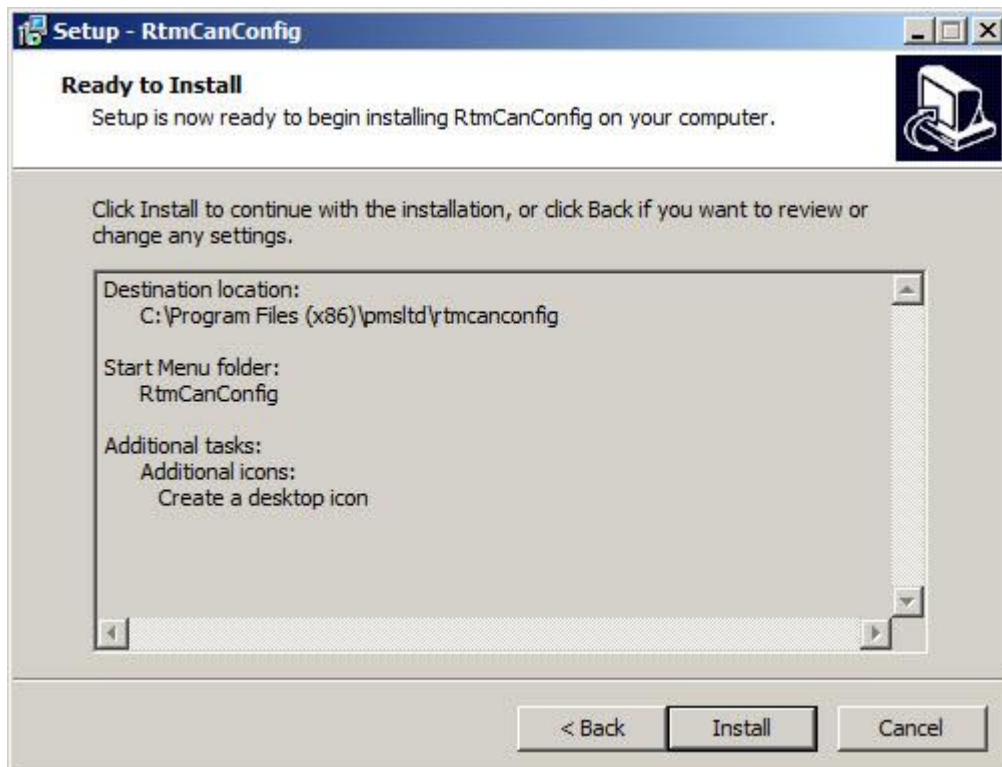
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Desktop Icon



Select check mark, if you will get a desktop icon. Click "Next" to proceed.

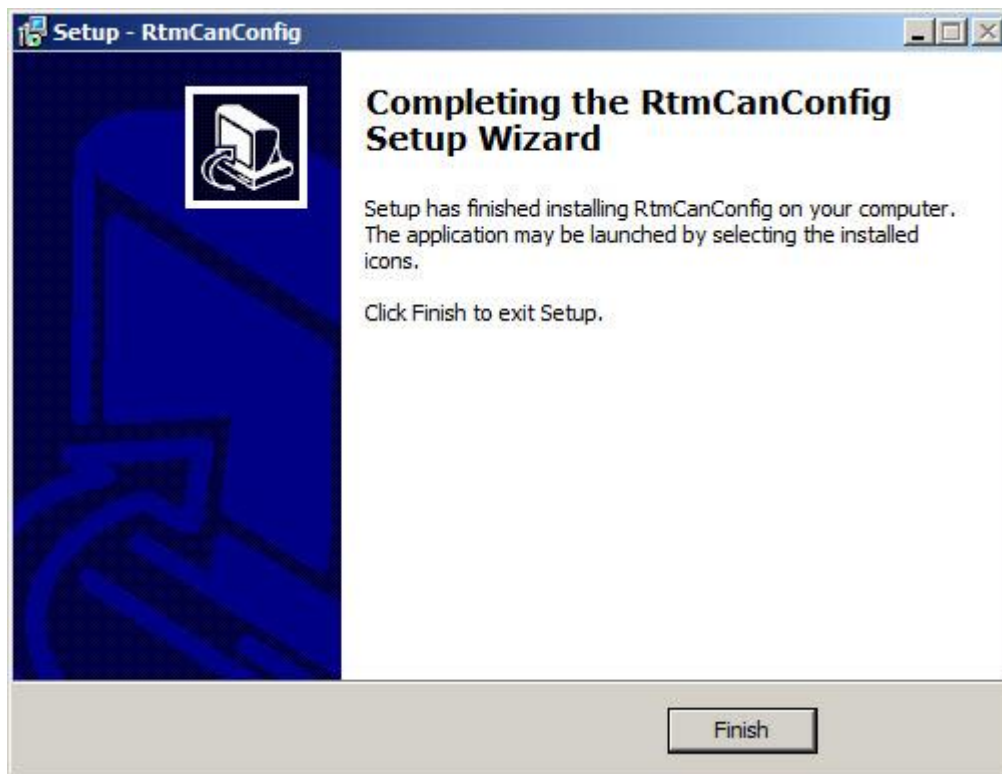
Ready to Installation



Click "Next" to start installation.

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Setup Complete



Click "Finish" to exit Setup.

Now you can start the program from the start menu in the folder "RtmCanConfig" or by clicking on the desktop Icon:



When the program is started for the first time after installation, it will prompt you for the user folder. The program settings are stored there. You should choose a folder where you have write access to also after installation, e.g., the "My Documents" folder. See chapter "User Folder"

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Program Operation

The RTMCANCONFIG program runs under Windows XP or Windows 7.

Starting the Program

The Program can be started via the "RTMCANCONFIG" program group in the Windows Start menu, via the on-screen shortcut icon "RTM Conf", or by double-clicking on the "RTMCANCONFIG.exe" file.



After starting the program the CAN driver will be loaded and all available CAN channels will be written to the channel list. The list of the measuring device models will be loaded from the "rtmcan_devices.ini" file.

If the configuration file contains at least one user configuration the first configuration is defined as the active one. If no user configuration has been created so far both tables remain empty.

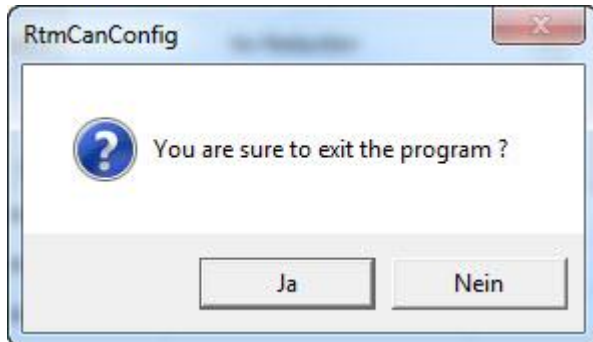
Commandline Parameter

/Service	Open Service Dialog with menü item „Device / Device Service“. see „Dialog Service“
/Autostart	After Starting the program call automatically the Commands “Connect” and „Read Data“.

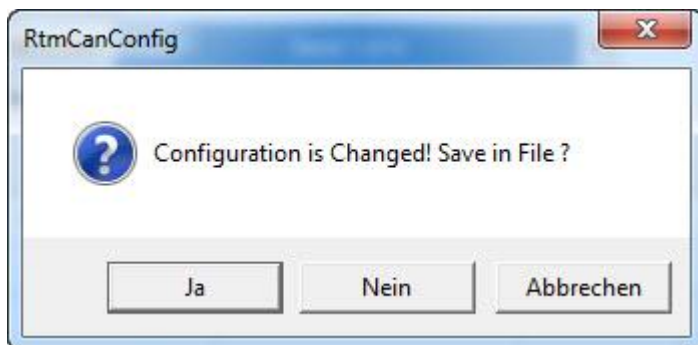
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Closing the Program

The Program can be closed by clicking "Close" in the File menu, by pressing the ALT+F4 keys, or by clicking on the "X" in the title bar. Before the program is closed a dialog box will prompt you for confirmation.



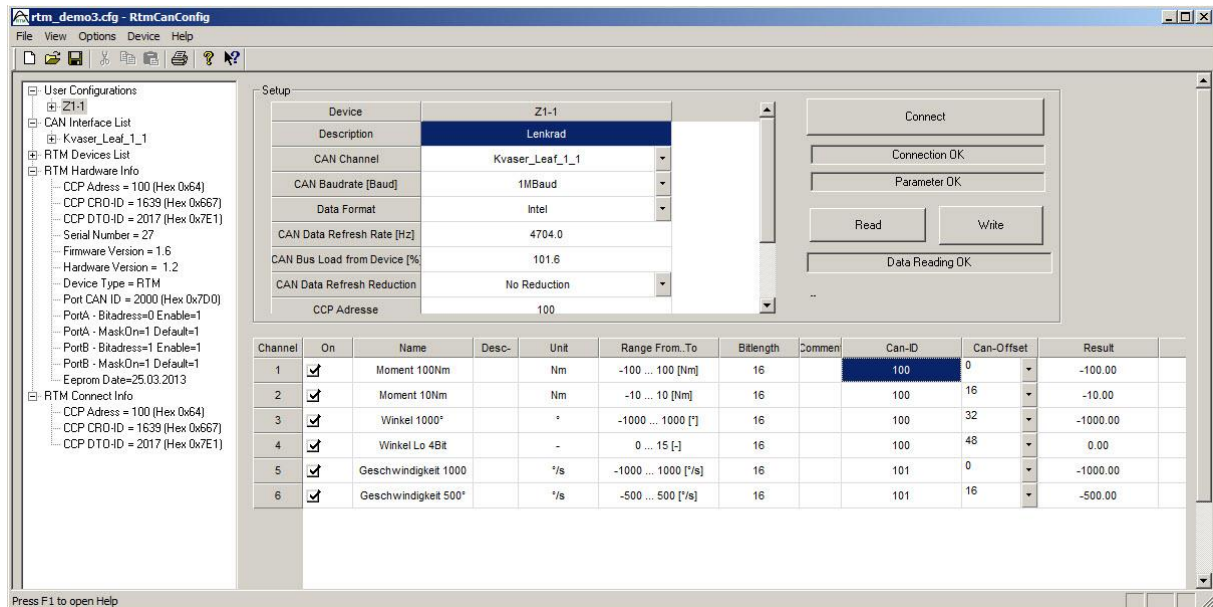
If the configuration has been changed, you will be asked if you want to save it.



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The Main Window

After starting the program the main window is displayed. It contains the tree structure and the two tables showing the active user configuration.



The title bar of the main window shows the name of the currently loaded configuration file. All functions and dialogs of the program can be selected from the menu bar. In addition, pop-up menus can be opened in the different sections of the main window by clicking the right-hand mouse button.

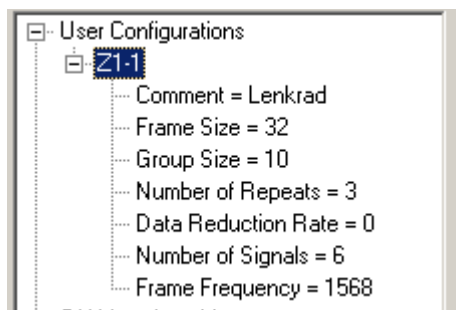
The status bar shows status messages or error messages of the program, respectively.

Tree Structure

The tree structure shows four sections „User Configurations“, „CAN Interface List“, „RTM Devices List“ and „RTM Device Connect“.

User Configurations

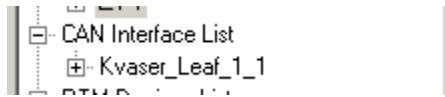
The "User Configurations" section shows the selected user configuration used by the program.



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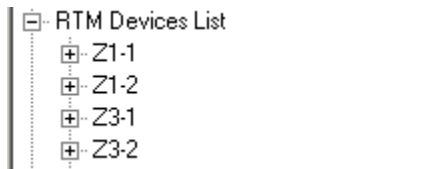
CAN Interface List

The "CAN Interface List" section lists all CAN channels detected at program start.



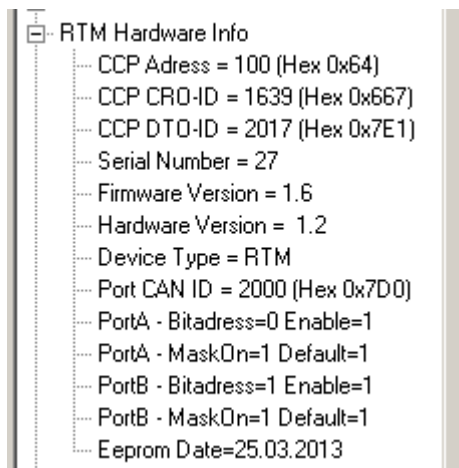
RTM Devices List

The "RTM Devices List" section shows the list of the available RTM telemetry system configurations.



RTM Hardware Info

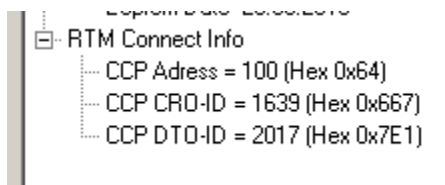
The "RTM Hardware Info" section shows the configuration of the connected RTM telemetry system device and its CAN interface card such as hardware and firmware version, date of programming and the CCP configuration. See chapter "Dialog Service / List of Device parameter".



The CCP configuration displayed in the Hardware Info is stored in the CAN Controller of the RTM telemetry hardware and will be used after startup.

RTM Connect Info

The "RTM Connect Info" shows the actual CCP configuration used by the program.



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Expanding/Minimizing the List

Clicking on the "+" sign preceding an item or, alternatively, double-clicking on the item will display the associated tree sub-entry. By clicking on the "-" sign you can hide the sub-entries.

Highlighting an Item

When you click on an item it will be highlighted. Clicking on a user configuration or an associated sub-entry will define this configuration as the active configuration.

Now, the parameters of the device and the parameters of the measuring channels are displayed in the two tables.

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Table of the Measuring Device Settings

The upper table shows the general settings of the active device.

Setup	
Device	Z1-1
Description	Lenkrad
CAN Channel	Kvaser_Leaf_1_1
CAN Baudrate [Baud]	1MBaud
Data Format	Intel

Setup	
Device	Z1-1
Data Format	Intel
CAN Data Refresh Rate [Hz]	4704.0
CAN Bus Load from Device [%]	101.6
CAN Data Refresh Reduction	No Reduction
CCP Adresse	100
CCP CRO-ID	1639
CCP DTO-ID	2017

CAN Channel

Select a channel from available CAN hardware.

CAN Baudrate

Select a bit frequency of the CAN transmission from list: The Default value is 1MBaud.

1MBaud
500kBaud
125kBaud
100kBaud
50kBaud
10kBaud

Data Format

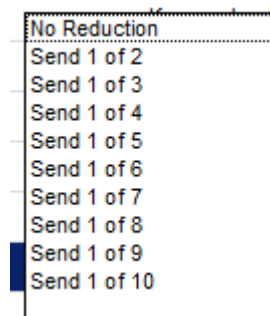
Select the bit order format from a list with INTEL or MOTOROLA. The Default value is INTEL. They differs in the order of the LSB-Byte, if storing a 16-Bit data word.

Intel
Motorola

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CAN data Refresh Reduction

Select from a list with “No reduction” and between 1 of 2 until 1 of ten



CCP Adress

The address value used by the CCP protocol. The Default value is 100.

(If you use different RTM telemetry systems at the same CAN bus, you have to use different addresses.)

CCP CRO-ID

The CAN identifier used for receiving by the CCP protocol. Its Default value is Dezimal 1639.

CCP DTO-ID

The CAN identifier used for sending by the CCP protocol. Its Default value is Dezimal 2017.

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Table of the Measuring Channel Settings

The lower table shows the parameters and measured values of all measuring channels of the active device. The table format can be setup in Menu "Options/Setup Signals list".

Channel	On	Name	Desc.	Unit	Range From..To	Bitlength	Comment	Can-ID	Can-Offset	Result	State	Min	Max	Adress
1	<input checked="" type="checkbox"/>	Moment 100Nm		Nm	-100 ... 100 [Nm]	16		100	0	-100.00	0	-100.00	-100.00	0
2	<input checked="" type="checkbox"/>	Moment 10Nm		Nm	-10 ... 10 [Nm]	16		100	16	-10.00	0	-10.00	-10.00	1
3	<input checked="" type="checkbox"/>	Winkel 1000°		°	-1000 ... 1000 [°]	16		100	32	-1000.00	0	-1000.00	-1000.00	2
4	<input checked="" type="checkbox"/>	Winkel Lo 48bit		-	0 ... 15 [-]	16		100	48	0.00	0	0.00	0.00	3
5	<input checked="" type="checkbox"/>	Geschwindigkeit 1000		/s	-1000 ... 1000 [/s]	16		101	0	-1000.00	0	-1000.00	-1000.00	4
6	<input checked="" type="checkbox"/>	Geschwindigkeit 500°		/s	-500 ... 500 [/s]	16		101	16	-500.00	0	-500.00	-500.00	5

On

If On, the Channel is transmitted in the CAN message.

Name

The channel name. Defined by the RTM telemetry system configuration file.

Description

A user comment for every channel.

Unit

The physical unit of the channel data

Range From to

Measuring range for the channel data. Defined by the RTM telemetry system configuration file.

Bitlength

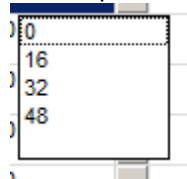
The bit size of the channel data.

CAN-ID

The Standard CAN ID of the channel. See The Menu

CAN-Offset

The bit position of the channel. Select from list:



Result

Last CAN data received. Format as defined in program options.

State

State of receiving CAN data

Min

The lowest data value received. The Menu "Device/Reset Min-Max" resets the value.

Max

The highest data value received. The Menu "Device/Reset Min-Max" resets the value.

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Adress

Adress of the channel as received in RF telemetry data stream. Defined by the RTM telemetry system configuration file.

Mouse Popup Menu

To activate, click with the right mouse key in the table.

The data in the table columns "On", "Description", "CAN-ID" and "CAN-Offset" can be edit by the user. The following Menu options are selectable:

Copy
Paste
Copy actual cell to all cells of this column
Number marked cells from 1
Reset Min/Max Values
Number CAN IDs (Marked Channels)
Number CAN IDs (All Channels)
Update Grid

Copy

Copies the string to the clipboard.

Paste

Paste the string from the clipboard.

Copy actual cell to all cell of this column

Copy the value of the actual cell to all cells of this column.

Number marked cells from 1

Number all marked cells starting from 1

Reset Min/Max Values

Reset the values in the Min and Max column

Number CAN IDs (Marked channels)

Number CAN Ids from start address only for selected channels in the table.

Number CAN IDs (All channels)

Number CAN Ids from start address for all channels in the table.

Update Grid

Refresh all Grid cells.

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Connect Button

Clicking on the "Connect" button starts the connection of the RTM hardware via the CAN bus, See the "Connect RTM Hardware" chapter.

Read Button

After the connection of the RTM hardware is established the configuration of the RTM device can be read from the RTM hardware. After reading, the status of the transfer is displayed. See the "Connect RTM Hardware" chapter.

Write Button

After the connection of the RTM hardware is established the configuration of the RTM device, as displayed in the Channel Table, can be sent to the RTM hardware. After sending, the status of the transfer is displayed. See the "Connect RTM Hardware" chapter.

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Connecting the RTM Hardware

After starting the configuration program, no CAN connection is active.

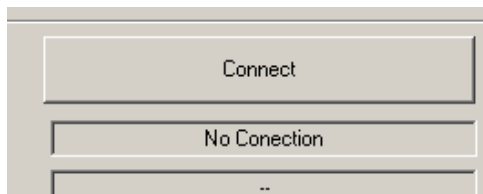
Connect Device

Click on the "Connect" button to connect the RTM hardware via the CAN bus. The CAN channel defined in the current configuration will be initiated, and communication with the RTM hardware is accomplished via the CCP address as defined in the "Measuring Device Settings" table and shown in the "RTM Connect Info" section of the tree.

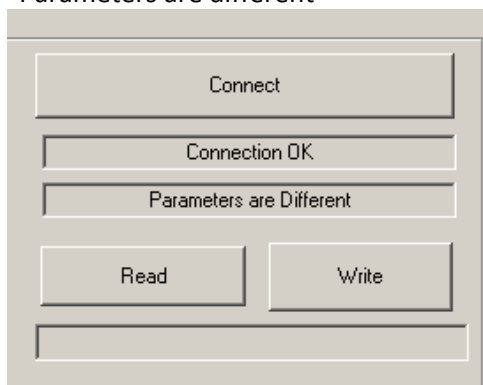
If there is a failure to get connection with the RTM telemetry system device, please check if the right CAN channel is defined and if the CCP address of the program and the RTM telemetry system is the same.

Connect Status

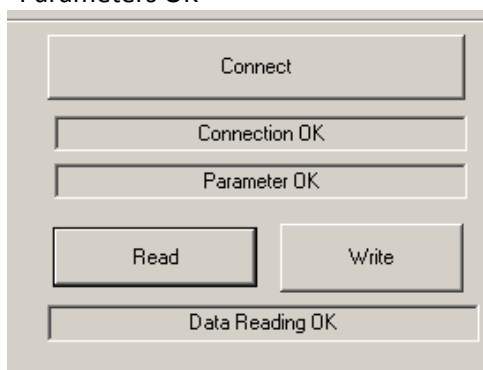
After the connection is established, the status of the RTM hardware is read and compared with the current configuration of the program. The connection status is displayed below the "Connect" button. The first line shows the program state: "No Connection" or "Connection OK"



The second line shows the comparison of the RTM hardware configuration: "Parameters are different"



"Parameters OK"



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Read or Write Parameters

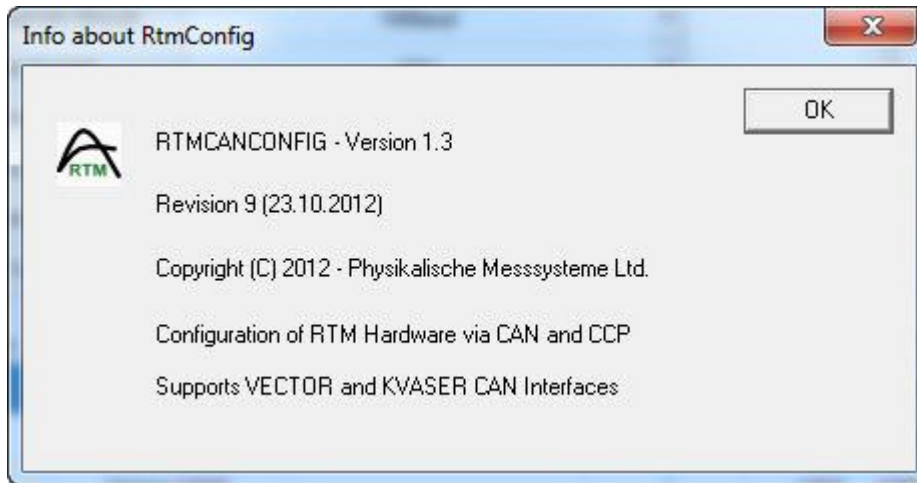
If the configuration parameters are different, the parameters can be read from the RTM hardware to the program or the program parameters can be written to the RTM hardware.

Disconnecting the Device

When the current configuration is changed the connection and also the CAN channel are automatically disconnected.

Version Information

The Info box is used to display the actual version of the RTMCANCONFIG program, the loaded drivers, the copyright message, and the license information.



To open the box, select "Help" and then "Info about RTMCANCONFIG".

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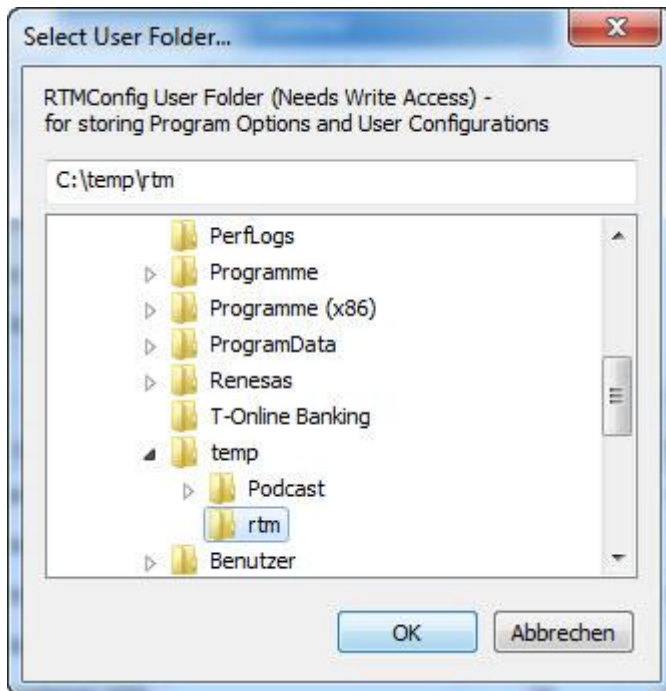
User Folder

The program uses a user folder to store the program settings, the report file and the configuration files. Its path is stored in the registry. The user folder needs write access rights.

HKEY_CURRENT_USER\Software\PMSLTD\RTMCANCONFIG

After the first program start you will be prompted for the user folder; it can be changed any time by selecting "User Folder" from the "Settings" menu.

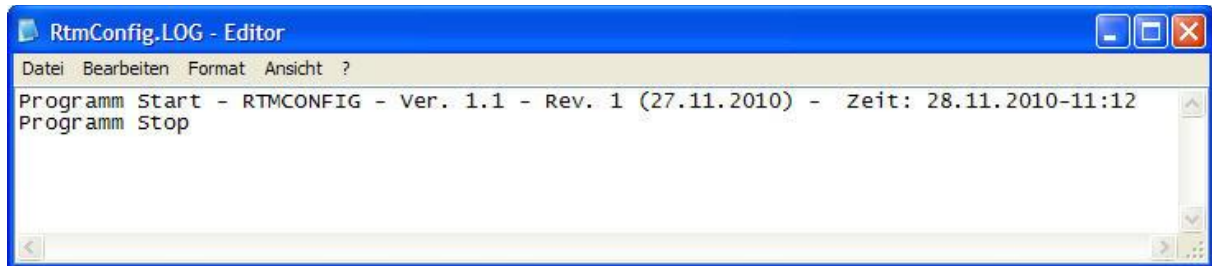
The current user folder is displayed in the "Program Options" dialog box.



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Report File

The Report File contains program messages and is edited in text mode. It can be opened with any editor.



Messages include the start and stop of the program and also error messages. All entries are provided with the current time and date. Error messages are stored together with the name of the source file and the line of code.

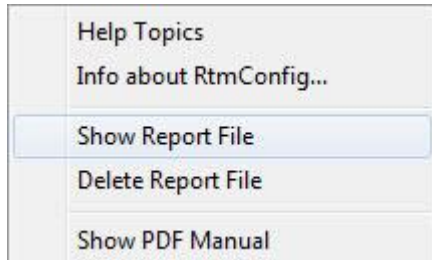
Example:

Programm Start Zeit: 15.04.2010-09:09

Programm Stop Zeit: 15.04.2010-09:11

Opening the Report File

From the "Help" menu, select "Display/Open Report File" to open the file with your Windows editor.



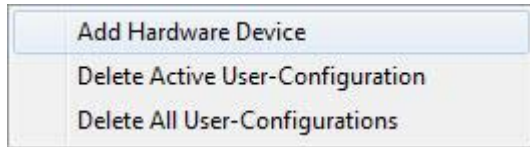
Deleting the Report File

From the "Help" menu, select "Delete Report File" to delete the file.

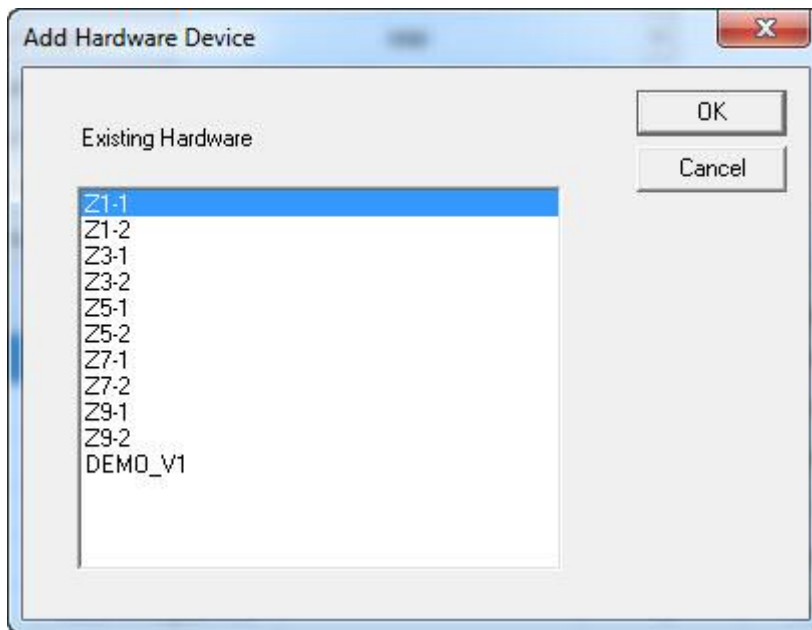
User Configuration

Creating a new User Configuration

To create a new user configuration click on "Add Hardware Device" in the pull-down menu of the tree. (The pull-down menu is opened by simply right-clicking into the tree.)

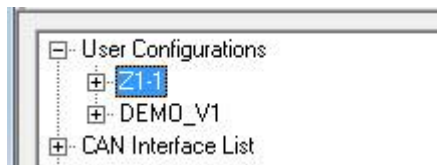


The dialog box with a list containing the available measurement device models will appear.



Available Hardware

When you click OK the highlighted model is accepted and inserted into the tree as the new user configuration. The new entry is shown under the last entry.



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Adjusting the Device Settings

The user configuration created according to the device model does not contain a name for the CAN channel, so far. Furthermore, default values have been set for the CAN baudrate, the CCP address, etc., which must be adjusted to the current hardware.

Setting the Channel Parameters of the Device

The same applies to the measuring channels of the new user configuration. That means that the CAN identifiers and CAN offset values must be set.

Changing the User Configuration

To enter new values highlight the table entry and then activate the editing mode by double-clicking into the cell, by entering a character manually from the key pad, or by pressing the F2 key.

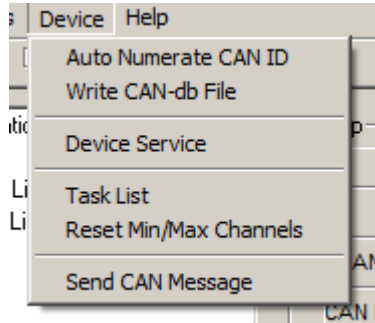
Special cells use selection lists, which are opened by clicking on the arrow of the cell. Highlight the desired item per mouse click or with the arrow key. The new entry will be stored when you release the mouse button or by pressing the Return key, respectively.

You can exit the editing mode any time by pressing the ESC key, by clicking into another section of the table, or by pressing the Return key. (When you use the ESC key the entry will be discarded.

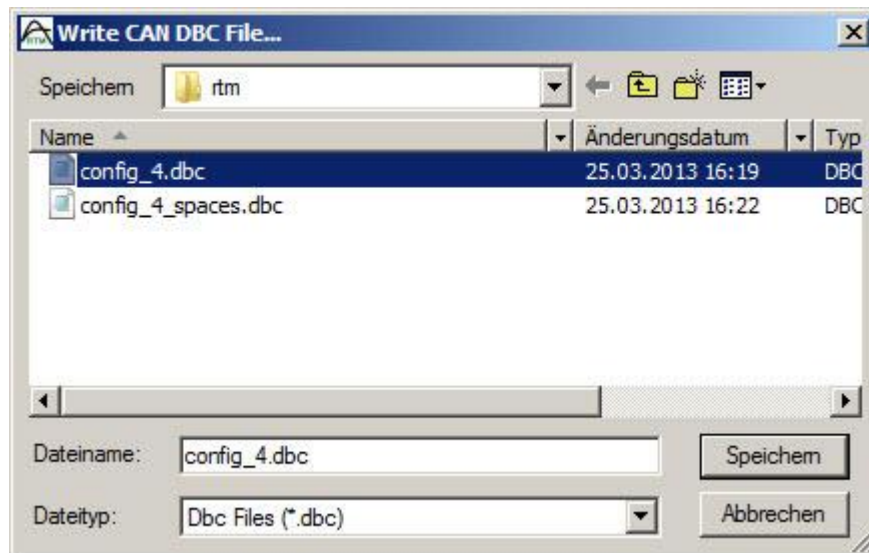
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CAN DBC File

The program saves the actual CAN configuration of the measuring channel table in a CAN DBC File for use in other programs to format the received CAN data values, such as the KVASER CAN DIADEM GPI Extension. Select in Menu "Device / Write CAN-db File".



In the following Dialog, select a folder and edit a filename for saving the CAN DBC information.



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Program Options

The screenshot shows the 'Program Options' dialog box. It has a title bar with a close button. The dialog is divided into two main sections: 'Result View' and 'Files and Folders'. In the 'Result View' section, there is a 'Format' dropdown menu set to 'Scaled', a 'Digits for scaling' text box with the value '2', and an 'Error Value' text box with the value '0'. In the 'Files and Folders' section, there is a 'Delete Options File before Saving' checkbox which is checked. Below this are five text boxes: 'User Folder' (C:\temp), 'File for Program Options' (C:\temp\RtmCanConfig.OPT), 'Report File' (C:\temp\RtmCanConfig.LOG), and 'Hardware Models' (M:\work\RtmCan\Software\RtmConfig\Config\rtmconfig_devices.ini). At the bottom of the dialog, there is a status bar showing 'Programm Version: RTMCANCONFIG - Version 1.3 - Revision 9' and 'Screen Resolution (BxH): 1920 x 1200'. There are 'OK' and 'Cancel' buttons in the top right corner.

From the field "Format" you can choose the format in which the values of the measurement values table are displayed. You can choose between these settings:

Scaled	Floating-point values (within the measuring range) are displayed
Raw data in decimal format	Digital values are displayed as integers
Raw data in HEX format	Digital values are displayed as integers in HEX format

In the field "Digits for Scaling" the number of decimal places of the floating-point value is displayed/can be changed.

The field "Error Value" shows the displayed value when a data error has occurred.

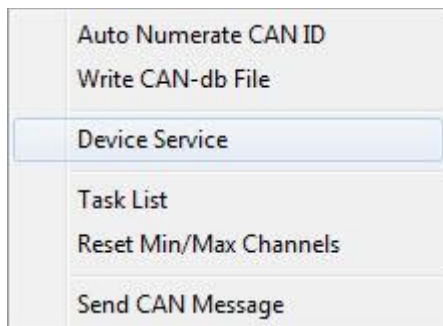
At the end of the program, all options are automatically stored in the "RtmCanConfig.OPT" file of the user folder.

At the bottom of the screen, the current program version and the screen resolution are displayed..

RTMCanConfig.EXE - Reference Manual

Dialog Service

Dialog for setting the hardware definitions. After clicking „Write Eprom“ the values are transferred to the RTM CAN Interface and written to EEPROM. At Power On of the RTM CAN Interface the values are loaded from EEPROM.



Call from menu item „Device / Device Service“

The 'Service Functions' dialog box contains the following fields and controls:

- Firmware Version: 1.6
- Hardware Version: 1.2
- Serial No: 24
- Device Typ: RTM
- Last Eeprom Program.: 26.02.2013
- CCP - Adress: 100
- CCP - CRO (Dez): 1639
- CCP - DTO (Dez): 2017
- Port A+B CAN Adress: 2000
- Buttons: OK, Cancel, Default, Write Eprom
- Port A section:
 - Bitadress[0..63]: 0
 - Default: ☒
 - Enable: ☒
 - Mask ON: 1
- Port B section:
 - Bitadress[0..63]: 1
 - Default: ☒
 - Enable: ☒
 - Mask ON: 1

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Attention! If you change the CCP adress or the value of the CCP CRO or DTO parameter in worst case you cannot connect to the RTM CAN Interface. In this case you can reset the RTM CAN Interface by setting the jumper on the board.

Steps for reset the RTM CAN Interface:

- Set the Jumper
- Power Off hardware
- Power On hardware
- Wait until LED is blinking
- Power Off hardware
- Remove the Jumper
- Power On hardware
- Reset Done

List of Device Parameter

Readonly Parameters:

Firmware Version	Actual CPU firmware version of the RTM CAN Interface
Hardware Version	Actual hardware layout version of the RTM CAN Interface
Last Eeprom Program.	Date of last EEPROM programming

Writable Parameters:

Serial No	Unique serial number
Device Typ	RTM Model Definition
CCP-Adress	CCP adress
CCP-CRO	CAN ID in CCP protocol for sending messages
CCP-DTO	CAN ID in CCP protocol for reading messages
Port A+B Adress	CAN ID for control of ports

PortA, PortB Parameters:

Bitadress	Bit Index in CAN port message. The value of this bit controls the voltage of the port, depending on mask
Default	Port Default value after power on. 0=0V, 1=3,3V
Enable	Enables the control of the port. 0=Off, 1=On
MaskOn	Bit mask in CAN message. If bit = mask, the voltage of the port is 3.3V, else 0V

Comand Buttons

Default	Set Default Values
Write Eprom	Transfer actual values to EEPROM on RTM CAN Interface.

Listing of file „rtmconfig_devices.ini“

[SYSTEM]

NumDevices =11

[DEVICE_1]

Name =Z1-1

NumSignals =6

Desc=Lenkrad

FrameSize=32

GroupSize=10

GroupRepeat=3

Signal_1 =Moment 100Nm,Nm , -100.000000, 100.000000, 1, 16, 0

Signal_2 =Moment 10Nm, Nm , -10.000000, 10.000000, 1, 16, 1

Signal_3 =Winkel 1000°, ° , -1000.000000, 1000.000000, 1, 16, 2

Signal_4 =Winkel Lo 4Bit, -, 0.000000, 15.000000, 2, 16, 3

Signal_5 =Geschwindigkeit 1000°/s, °/s , -1000.000000, 1000.000000, 1, 16, 4

Signal_6 =Geschwindigkeit 500°/s, °/s , -500.000000, 500.000000, 1, 16, 5