



Monitoring Manual

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Table of contents

1	Preface.....	8
1.1	Conventions	8
1.2	Acronyms	9
1.3	Glossary	9
1.4	Related documentation.....	10
2	Introduction	11
2.1	Document structure	11
3	Standard Approach	12
4	Graphical environment	14
4.1	Status bar	14
4.1.1	VIS Online/VIS Offline/SIM.....	14
4.1.2	Parameters in sync with target/changed on target.....	14
4.1.3	Record file	15
4.1.4	Time.....	15
4.2	Menu Bar.....	15
4.2.1	File menu	15
4.3	Mode menu	16
4.4	Home menu.....	17
4.4.1	Data	17
4.4.2	Language menu	17
4.4.3	Authorization menu	17
4.5	View menu.....	18
4.6	Simulation menu.....	19
4.6.1	RTC	19
4.6.2	Time laps	20
4.6.3	Execution Mode	20
4.6.4	Sequences	20
4.7	Visualization menu	20
4.7.1	Run	20
4.7.2	Online	21
4.8	Settings menu	21
4.8.1	Settings.....	21
4.9	Communication menu.....	23
4.10	? menu	25
4.11	Record panel.....	25
4.11.1	Record mode	26
4.11.2	Playback mode	27
4.11.3	Record Panel Feature Notes.....	29

4.12	Main window	30
4.13	Graphical display of values.....	32
4.14	Recording options	34
4.14.1	Database	34
4.14.2	ASCII Export	35
4.14.3	Sequence-export.....	36
4.14.4	General export settings.....	36
4.14.5	Recording	37
4.15	Event notification	37
4.16	File transfer	39
4.16.1	Transfer file from PC to Target.....	40
4.16.2	Transfer file from Target to PC.....	41
4.17	Transfer recording.....	41
5	Visualization	44
5.1	Serial connection	44
5.2	Ethernet/ TCP-IP connection	44
5.3	Modem connection	44
5.3.1	Modem directory	45
5.3.2	Connection establishment	46
5.3.3	Communication parameter	46
5.4	Remote Control	47
5.4.1	General information.....	47
5.4.2	The user front window in Offline mode	48
5.4.3	The user front window in the online mode	48
5.5	Connection errors	49
6	Simulation	50
6.1	Time laps and execution modes	50
6.2	Single step mode.....	50
6.3	Sequence processing	51
7	For Developers.....	52
7.1	Starting Simulation and Visualization.....	52
7.1.1	Simulation	52
7.1.2	Visualization.....	52
7.2	Creating standalone Visualization and Simulation applications.....	54
8	Creation of standalone applications.....	55
8.1	Manual creation	55
8.1.1	Usage of the <i>standalone.bat</i> file WITHOUT parameters.....	55
8.1.2	Usage of the <i>standalone.bat</i> file WITH parameters	55
8.2	Automatic creation.....	56
8.3	Embedding of project specific files in the client index	56
8.4	Start Simulation/Visualization from command line	57

8.5	Command line parameters	57
8.5.1	Communication configuration	58
9	Debugging.....	59
9.1	Select project.....	59
9.2	Microsoft Visual C++ development environment.....	59
9.3	Properties page	60
9.3.1	Command	61
9.3.2	Command arguments.....	61
9.4	Debugger operating.....	61
10	Using ITC Interface (Inter Tool Communication)	64
10.1	Available commands	64
10.1.1	Execute single step.....	64
10.1.2	Get current data	64
10.1.3	Open a sequence.....	64
10.2	Receiving data	64
11	Appendix	66
11.1	Alternative connections between controller device and Visualization.....	66
11.2	Simulation and Visualization license.....	66
11.3	Creation of a modem communication	66
11.3.1	Modem list	66
11.4	Manipulation and initial state	67
11.4.1	Editing data during Visualization	67
11.4.2	Editing data during Simulation.....	68
11.4.3	Initial state of data items	69
11.5	Database.....	69
11.5.1	Customize record-file extension	70
11.6	Window settings of the application	70
11.7	Configuration of Ribbonbar.....	72
11.7.1	XML-Nodes.....	72
11.7.2	XML-Attributes	75
11.7.3	Supported uids.....	77
11.8	Reduced communication	78
11.9	Including a file for online help	80

List of Figures

Figure 4-1, Status bar	14
Figure 4-2, Menu ribbon bar	15
Figure 4-3, file menu	15
Figure 4-4, Mode menu	16
Figure 4-5, Dialog “Simulated RTC”	19
Figure 4-6, Timing dialog (since 4.12i, Rev.9472).....	22
Figure 4-7, Record panel in Record mode	26
Figure 4-8, Record panel in Playback mode	27
Figure 4-9, Record selector dialog.....	28
Figure 4-10, Main window	30
Figure 4-11, Value histogram	33
Figure 4-12, Record-Settings-Database	34
Figure 4-13, Error message for maximum data records reached with Automatic Saving disabled	35
Figure 4-14, Record Settings – ASCII export.....	35
Figure 4-15, Record Settings – Sequence Export.....	36
Figure 4-16, Record Settings – General export settings	37
Figure 4-17, Record Settings – Recording.....	37
Figure 4-18, Event notifier	38
Figure 4-19, Event notifier – External program	39
Figure 4-20, File transfer dialog.....	40
Figure 4-21, overwrite confirm dialog.....	40
Figure 4-22, example of full path	41
Figure 5-1, Modem connection	45
Figure 5-2, Selection window to add and modify the phone number	45
Figure 5-3, Input window for name and modem number	46
Figure 5-4, Call-back number Dialog	46
Figure 5-5, Modem parameter	47
Figure 5-6, User front window in the Offline mode	48
Figure 5-7, User front window in the Online mode	48
Figure 7-1, The Simulation toolbar	52
Figure 7-2, The Visualization toolbar	52
Figure 7-3, Start of Simulation from Build menu	53
Figure 7-4, Start of Visualization from Build menu	53
Figure 8-1, Build Menu – Create standalone version	56
Figure 9-1, Selection of directory and file	59
Figure 9-2, Set Debug	59
Figure 9-3, Context menu	60
Figure 9-4, Properties page.....	60
Figure 9-5, Command	61
Figure 9-6, Command matters.....	61
Figure 9-7, How to add a Debug toolbar	62
Figure 9-8, Debug toolbar.....	62
Figure 9-9, Report of the Microsoft development environment.....	62
Figure 9-10, Report: no symbolic information for Common.exe	63

List of tables

Table 1, Conventions	8
Table 2, Symbol conventions.....	9
Table 3, Acronyms	9
Table 4, Glossary	10
Table 5, command affected groups; (1) the persistent data is not only transferred but will also be written to the persistent storage of the target.	25
Table 6, Bars colours used to display Elements type.....	31
Table 7, Display of editable values	31
Table 8, Display of alarm conditions	32
Table 9, Display options	32
Table 10, Connection errors	49
Table 11, command line parameters	57
Table 12, Supported modem	66
Table 13, Unsupported modem	67
Table 14, Editing data during Visualization.....	68
Table 15, Editing data during Simulation	68
Table 16, Initial state of data items	69

1 Preface

This manual is for all application developers and is a complete guide to radCASE modeling and design items.

This manual assumes that the user is familiar with basic concepts of Software Engineering, in particular:



- programming in C/C++
- OO programming;
- basic skill in UML;
- HW/SW embedded architectures.

1.1 Conventions

This Manual uses the following conventions:

Example	Usage
Syntax is: <i>SV=123</i>	radCASE syntax
<code>doSomething() // Comment</code>	C-Code examples
SURFACE_XXX	radCASE language element
<u>refer to</u>	cross reference in document
<i>module.c</i>	filename or path
XXX	Used as placeholder for user specific names
>	Used for menu commands and specify the path (File > Open).
<>	The angles brackets are used for enclosing the name of a key on the keyboard (E.g. <F9>).
+	Plus sign between two or more keys requires to press them simultaneously, e.g. <Shift>+<F9>.

Table 1, Conventions

Symbol	Usage
	Used for providing hints and suggestions
	Used for calling attention to specific issues and supply important information


Symbol	Usage
	Used to alert for particular issues to avoid a hard time

Table 2, Symbol conventions

1.2 Acronyms

	Refers to
API	Application Programming Interface
GUI	Graphical User Interface
HMI	Human Machine Interface
IDE	Integrated Development Environment
IOs	Inputs/Outputs
MD	Modular Design
radCASE	Rapid Application Development Computer Aided Software Engineering
RTOS	Real Time Operating System
UML	Unified Modeling Language

Table 3, Acronyms

1.3 Glossary

Context menu	The menu that is opened by clicking with the right mouse key, which offers a context-dependent selection depending on the position of the mouse pointer.
Element type	Attributes of an element, the data type defined in section Data Types, which is based on a template type Binary, Numeric, String, Date and Time.
Element Usage	The attribute Usage Type defines the usage of an element by selecting it from a list, e.g. digital output (DO), analog input (AI), flag, timer etc.
Embedded HMI documentation	Automatically generated documentation of Target-HMI in form of a navigable individual display (with interaction description) of all the screens defined by DocTabs .

Entity Tab	Hardware-Instance table manages attributes for IOs.
State Machines	Effective, graphic method for describing functions and flows (especially in the controls).
Forward referencing	Items access other items in the tree structure, which is defined further up in the tree structure of the design file.
HMI	The Human Machine Interface is the display input options for users (e.g. via display, keys etc.).
HMI overview	Automatically generated documentation of Target HMI in form of an overview (a large page), where all screens defined by DocTabs are shown in their calling hierarchy.
Library	.rad file, which can be used in different projects due to its general character.
Main design file	.rad file (in XML format) with a module called "System". This module can be present only once in a project.
Module interface	The section "Interface" of a State Machine contains the elements used for inter-module communication.
OO / OOP	Object Oriented Programming is a philosophy that is based on the IT concept of objects and uses terms such as classes' instances.
Sub-design file	.rad file (in XML format) without "System" module. This can be present multiple times within a project.
Targets	Embedded or PC hardware on which the application runs.
Controller	Micro Controlling Unit which runs the application

Table 4, Glossary

1.4 Related documentation

- Release Notes.
- Getting Started.
- Quick Start Guide.
- Developer's Guide.
- Tester's Guide.
- API Guide.

2 Introduction

The Monitoring Manual describes the creation, management and usage of the PC Offline Simulation and the PC Online Visualization (see also IDE Manual). In particular this document explains the “radMON” environment of radCASE.

In general, the Software radCASE consists of three main parts. “radEDIT” and “radGEN” are used to develop and generate Software as well as creating the Simulation and Visualization. “radMON” then launches the desired monitoring application.

The PC Offline Simulation (called “Simulation”) allows the execution of the created application without the use of a hardware, i.e. tests, representations or training is possible without downloading any specific software and without connecting to any target hardware.

The PC Online Visualization (called “Visualization”) is used to change, show and elaborate information through a data connection with the controller. More directly, it is possible to observe remotely the operation of a machine for example via Ethernet from an office desk. The Visualization also displays the HMI Interface of the hardware for remote usage

Simulation and Visualization can be created and used inside radCASE IDE or also as independent Windows Software (executable without radCASE).

2.1 Document structure

This manual is organized as follows. In Chapter [Standard Approach](#) the usage of the standalone Applications is explained. The creation of an independent executable Simulation or Visualization is described later on in chapter [Creating standalone Visualization and Simulation applications](#).

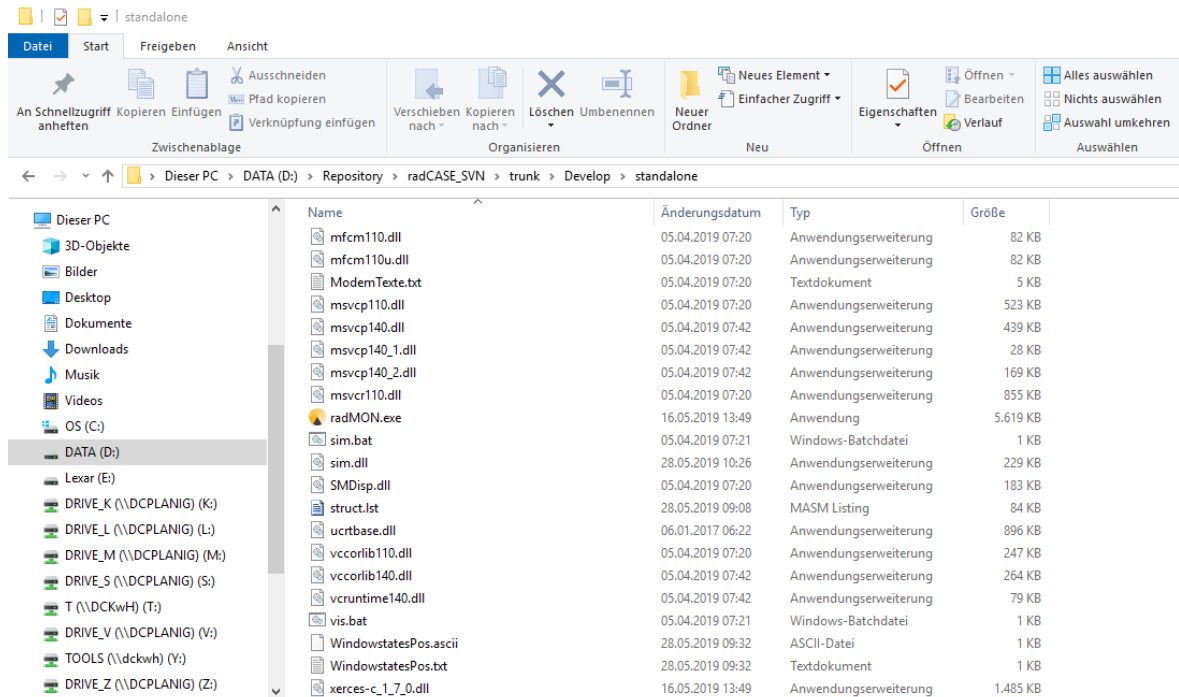
Chapter [Graphical environment](#) presents the instruments and interfaces for working with Simulation and Visualization tools. Chapter [Visualization](#) explains how to setup a connection between the Visualization application and the controller device and chapter [Simulation](#) describes how to manage simulation process.

Chapter [For Developers](#) consists of useful information for developers which are using radCASE. More precisely the chapter introduces the main steps for starting a Simulation or Visualization out of radEDIT. In fact, depending on the program call options, the software radMON can be started in the Simulation or Visualization mode (see [Starting Simulation and Visualization](#)).

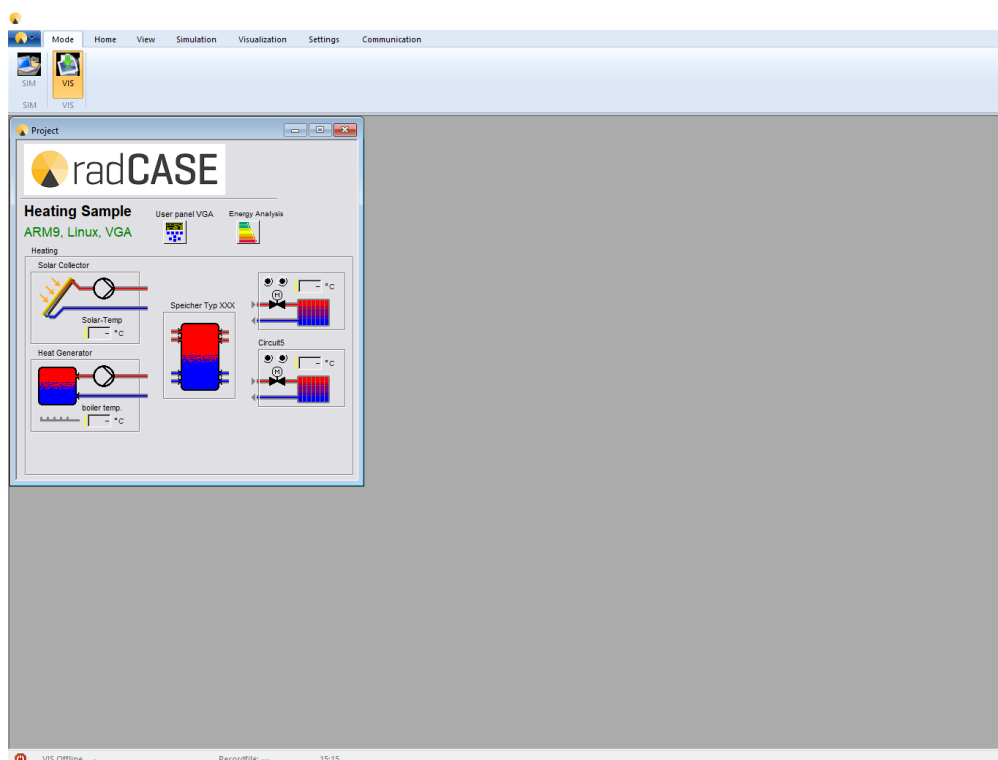
[Debugging](#) presents the steps for debugging the developed application with the Microsoft Visual C++ environment.

3 Standard Approach

If a standalone monitoring application was received, it should be possible to find a sim.bat/vis.bat inside the given folder.

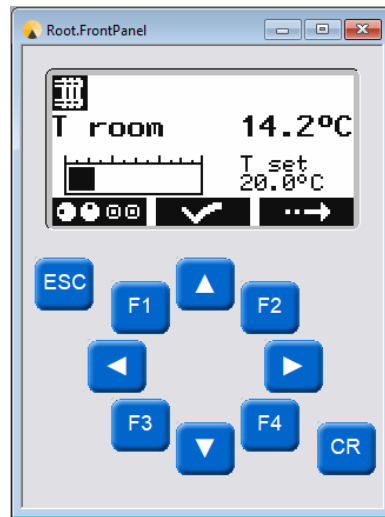


After execution radMON will open the Simulation or Visualisation. The appearing window could look like the following image (in this case the Visualization was opened).



On the Top row you can see a menu ribbon bar which enables configuration of the monitoring environment. For detailed description refer to [Menu Bar](#).

The “Project” window is the main screen of the Visualization and Simulation. From there you can open the user front panel which displays a window with the HMI interface (how it will be realised on the hardware). Refer to [Remote Control](#) for more information.



In the following chapter the [Graphical environment](#) will be explained more detailed.

4 Graphical environment



The following description of the graphical environment assumes using the standard ribbon bar and no customized ribbon bar, where items could be changed/moved/hidden/greyed out

4.1 Status bar

The Status bar contains the following information:

- VIS Online/VIS Offline/SIM;
- record-file name;
- current System time;

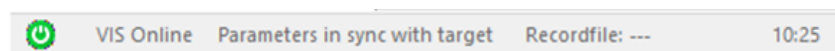
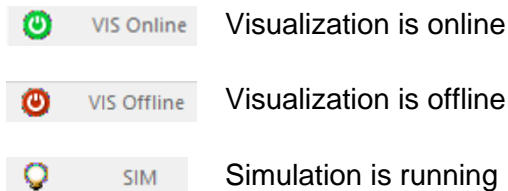


Figure 4-1, Status bar

The radCASE status bar is depicted in [Figure 4-1](#) and its fields are described hereafter.

4.1.1 VIS Online/VIS Offline/SIM

This field shows if the Windows-Visualization is Online or Offline or if the Windows-Simulation is running:



Note that there can be different reasons as the system is Offline:

- the cables are not connected correctly
- the connection cable is broken
- the communication port is not configured correctly. For this select the communication dialog in the menu and check the settings. Refer to [Visualization](#).

4.1.2 Parameters in sync with target/changed on target

This field shows if the parameters on target are synchronized with the parameters displayed in Visualisation (since 4.12i, Rev. 9035 – see also [4.7.1](#)).

4.1.3 Record file

In this field it is displayed the name of the currently opened memory file.

4.1.4 Time

The current system time is displayed here.

4.2 Menu Bar

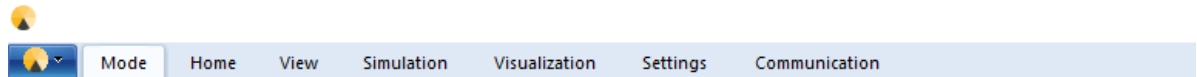


Figure 4-2, Menu ribbon bar

Standardly you will see the shown ribbon bar displayed in [Figure 4-2, Menu ribbon bar](#). It is possible to adapt the ribbon bar to the users needs and wishes with a XML-script, refer to chapter [11.7](#). Different program settings can be made with the Menu Bar. Furthermore it allows to change between different display types. Here is the list of the single menu options and their functions:

4.2.1 File menu

The file menu deals with files used for database recording and playback – refer to chapter [4.11](#) for further details (except for the menu entry “Exit” which closes the radCASE Simulation and Visualization tool).

The file menu is activated by clicking on the round radCASE-Icon on the left side of the ribbon bar or by shortcut <Alt><F>.



Figure 4-3, file menu

New

Opens a new record-file. If there is already an opened record file, it has to be saved or dropped.

Open	Opens an already existing record file. This is only possible if the Playback-Mode has activated. If there is already an opened record-file, it has to be saved or dropped. See Playback mode .
Save	Saves the current data in the currently activated record-file (refer also to 4.1.3), if any is currently opened. If no record-file has been opened, a dialog to define a record-file name will be opened. To use a customized record-file extension refer to 11.5.1 .
Save as ...	Saves a record-file with a name that has to be indicated. To use a customized record-file extension refer to 11.5.1 .
Print	See below, Printing functions .
Close	closes the currently activated record-file
Exit	Closes the program

4.2.1.1 Printing functions

The functions always refer to the current active window. Every window can have a print surface. If the current window does not have a print surface the program communicates it.

Print	Prints the displayed page. Use the graphical display to set the area for printing (see Graphical display of values). The defined area is automatically transferred in the print preview and then for the printing.
Print preview	Shows the page to be printed. Use the graphical display to set the area for printing (see Graphical display of values). The defined area is automatically transferred in the print preview and then for the printing.

4.3 Mode menu

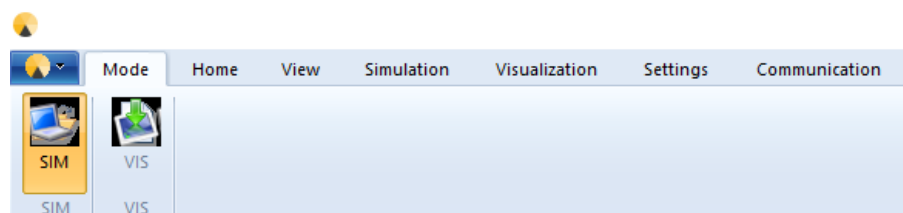


Figure 4-4, Mode menu

SIM	Activates the Simulation and disables the current Visualization
VIS	Activates the Visualization and disables the current Simulation

4.4 Home menu

4.4.1 Data

ASCII-Export	Exports the recorded data of all ASCII-Export-Elements into a comma/semicolon separated file. For options and settings of this export refer to ASCII Export .
Sequence-Export	Exports only a sequence of the recorded data into a comma/semicolon separated file. For options and settings of this export refer to Sequence-export .

4.4.2 Language menu

Language	Allows changing the language used by the Simulation/Visualization application.
-----------------	--

4.4.3 Authorization menu

The Authorization menu allows setting passwords for different levels. According to these settings, some sections can be blocked for the lower levels. There are a total of 10 levels: 0 is the lowest and 9 is the highest password level.

Authorize	Allows to type in a password to unlock a password level. If the entered password matches with any password level, this matching level and all lower levels will be unlocked. The access of sections with higher password levels will be still denied.
Lock	Locks the enabled password level again.
Passwords	It is possible to see all the passwords matching the current password level and lower password levels. Every listed password can be changed by double clicking on it. If any standard password has been ever changed, the new set will be saved in a file called "passwordlist.dat". This file must be deleted to reset all the customized passwords.

4.4.3.1 Default functions locked by a password

- The editing of an element can be blocked by a password (using the PL tag in the Format string).
- A password of at least level 5 is needed to activate the Force-Mode for the hardware outputs. This behaviour could be changed with the feature permissions (refer reference manual for more information's).
- Some more features could be set with the feature permissions (see reference manual).

4.5 View menu

The **View menu** allows to show or to close the different bars and windows. A tick symbolizes that the bars and windows have to be shown.

4.5.1.1 Zoom

Zoom minus / plus

4.5.1.2 View Windows

View Status Bar	Activates or inactivates the Status Bar.
View Properties	Activates or inactivates the properties to display the Module Info and the Element Info of a Module that has marked in Module Tree
View Module Tree	Activates or inactivates the Module Tree
View Output	Activates or inactivates the Output window
Freeze Output	Freezes the output window. When freezed no more texts are added to the output. The texts are saved in the background and will be added, when unfreezing.

4.5.1.3 View

Record panel	Opens the window for the Record panel. See Record panel for details.
---------------------	--

4.5.1.4 Windows

The window display types can be set here. This menu allows activating a window from the opened ones. The activated window will come to the foreground.

Cascade	Orders the windows from left top to right down. Only the Title bar is displayed for the underlying windows.
----------------	---

Tile Horizontal

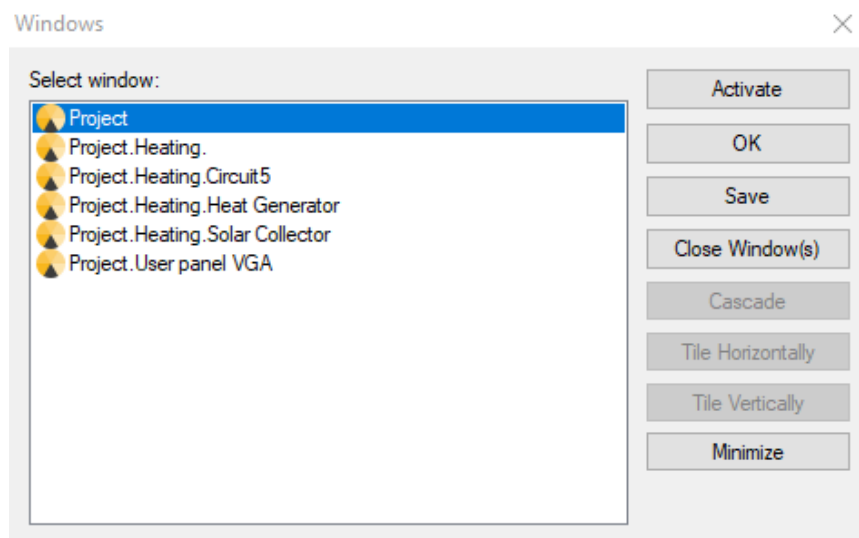
Orders the windows horizontally in the main window side by side without overlapping. Every window has the same dimension and the space in the main window is completely used.

Tile Vertical

Orders the windows vertically in the main window side by side without overlapping. Every window has the same dimension and the space in the main window is completely used.

Windows...

If there are several module windows opened, it is possible to choose which one to be displayed at the front in this part of the drop-down menu. By clicking on “Windows...” a Dialog like shown below will be opened.



4.6 Simulation menu

4.6.1 RTC

Simulated RTC

Allows to set date and time of the simulated control (see [Figure 4-5, Dialog “Simulated RTC”](#)). These values can be set to the current values through the buttons **Act. Date** and **Act. Time**.

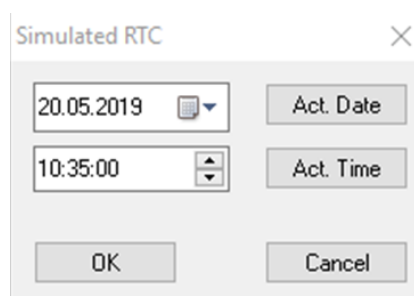


Figure 4-5, Dialog “Simulated RTC”

4.6.2 Time laps

It is possible to activate a time scale factor for the Simulation in order to run the process simulation in a quicker time. Possible factors are:

- 1x
- 5x
- 10x
- 25x

(Refer to [Time laps and execution modes](#))

4.6.3 Execution Mode

Single Step Mode On	Activates or inactivates the single step mode.
Next Single Step	Executes next step.
Run/Stop Single Steps	Toggles between executing/stopping the next steps.

(Refer to [Single step mode](#))

4.6.4 Sequences

Open Sequence	Open a sequence for processing
Process Sequence	Activate execution of open sequence
Close Sequence	Closes the open sequence

(Refer to [Sequence processing](#))

4.7 Visualization menu

4.7.1 Run

Force Mode	Activates or deactivates the Visualization internal Force mode. When the Force mode is activated it is possible to force individually digital and analogue outputs or inputs of the target system by clicking the icons in the Visualization. This means that the respective Input/Output is divided from the target process and allocated with a “fixed value”. When the Force mode is inactive, all the forced outputs are enabled i.e. connected with the respective process.
Automatic update of parameters	The visualization will detect if parameters are changed on the target and will display this in the status bar. If this new

feature “automatic parameter update” is activated, the visualization will automatically call “Parameters from device” when the parameters are changed.

Previous behaviour (up to 4.12i, Rev. 9034): When a parameter was changed from visualization the visualization would wait for the time specified in Timings dialog “Parameter update”. After that time “Parameters from device” would be called automatically. This only worked as long as the parameters were changed from visualization and not from the target. The new feature replaces this, so the old setting is not needed anymore. The new feature supports detecting changes of parameters regardless if they were triggered from visualization or directly on target.

4.7.2 Online

Receive mode

Activates the record/receive mode and deactivates the playback mode (refer to [Record mode](#)).

Playback mode

Activates the playback mode and deactivates the record/receive mode (refer to [Playback mode](#)).

Burst mode

Activates or inactivates the Burst transfer mode (refer to [Record mode](#)).

4.8 Settings menu

4.8.1 Settings

Select Communication Interface

Select the interface used for communication. The communication is done through a plugin DLL. These can be added and removed to the project monitor, to allow communication over all supported communication channels of the target controller. The option opens a dialog box to select the plugin DLL identified by a name provided by the DLL.

Configure Communication Interface

Configures the currently selected communication interface. The configuration is DLL specific and is provided by the DLL. The configuration contains further information to establish a connection for a communication channel, e.g. Com-Port and Baudrate for a serial interface or IP-address for an Ethernet connection.

Recording Settings

Opens a dialog box with the settings for recording of data and automatic saving of those recordings. Refer to [Recording](#).

Event notifier

Opens a dialog box with the settings for notification on special events. Refer to [Event notification](#).

Timing

Opens an input dialog to set different time values (see [Figure 4-6](#)). For more information's refer to reference manual chapter 4.8.2 (Language Reference – Settings – Timing).

Timing

Target communication timing			
Interblock Delay (IBD)		<input type="text" value="10"/> ms	<input type="button" value="Default"/>
Data communication rate (DCR)	every	<input type="text" value="1"/> Cycle(s)	<input type="button" value="Default"/>
HMI communication rate (HCR)	every	<input type="text" value="1"/> Cycle(s)	<input type="button" value="Default"/>
Asynchronous communication rate (ACR)	every	<input type="text" value="1"/> Cycle(s)	<input type="button" value="Default"/>
Touch communication rate (TCR)	every	<input type="text" value="1"/> Cycle(s)	<input type="button" value="Default"/>
Debug communication rate (DMR)	every	<input type="text" value="0"/> Cycle(s)	<input type="button" value="Default"/>

Visualization timing			
Project monitor update rate (DR)		<input type="text" value="250"/> ms	<input type="button" value="Default"/>
Offline limit (TG)		<input type="text" value="5000"/> ms	<input type="button" value="Default"/>
Compressed rate (CG)		<input type="text" value="1000"/> ms	<input type="button" value="Default"/>
Burst rate (BG)		<input type="text" value="20"/> ms	<input type="button" value="Default"/>

Figure 4-6, Timing dialog (since 4.12i, Rev.9472)

4.9 Communication menu

The Communication menu is used during Visualization to control the communication between the Visualization application and the controller. It offers the following commands:

Parameters from device	Loads application parameters PAR and/or SYS from the controller device to the Visualization application. This will be done automatically if a parameter on the controller has changed and if this option has not been explicitly disabled (see also 4.7.1 “Automatic update of parameters” since 4.12i, Rev. 9034)
Parameters to device	Sends the application parameters PAR and/or SYS from the Visualization to the controller device and stores them to the persistent storage. Note that before those parameters are send to the application, they must be loaded with Load parameters command.
Load parameters	Loads (not send) parameters PAR from the hard disk to the Visualization application on choosing a *.par-file. Also on choosing a XML-file the parameters PAR will be loaded but not send to the controller. On loading parameters via XML-file and desktop setting SE (refer to reference manual) is set, the SYS will be loaded and send to controller. On loading parameters via XML-file and desktop setting PRE (refer to reference manual) is set, the PROC will be loaded and send to controller. Each transmitted parameter is stored on the persistent storage of the controller.
Save parameters	Saves parameters PAR from the Visualization application to the hard disk drive into a XML-file. If desktop setting SE (refer to reference manual) is set, also the SYS is saved into that file and if desktop setting PRE (refer to reference manual) is set, also the PROC is saved.
Parameters to ASCII	Saves the parameters PAR in an ASCII text format. See section ASCII Export for details. If desktop setting SE (refer to reference manual) is set, also the SYS is saved into that ASCII file.
File transfer	Opens a dialog which makes it possible to transfer files from the computer to the target device or from target to computer (refer to 4.16).
Transfer recording	Opens a dialog which makes it possible to transfer a recording made with <i>recording.rad</i> from the target to the computer. (refer to Transfer recording)
Modem connection	Opens the modem connection dialog, where the settings

for a modem connection can be set. Further information about the parameter settings for the modem is given in section [*Serial connection*](#)

The following table shows, which groups of the persistent data (**SYS**, **PAR**, **PROC**) are affected by which commands:

Command	SYS	PAR	PROC
Parameters from device	Yes	Yes	No
Parameters to device	Yes(1)	Yes(1)	No
Load parameters (via *.par-file)	No	Yes	No
Load parameters (via *.XML-file)	If SE=1 (1)	Yes	If PRE=1 (1)
Save parameters	If SE=1	Yes	If PRE=1
Parameters to ASCII	If SE=1	Yes	No

Table 5, command affected groups; (1) the persistent data is not only transferred but will also be written to the persistent storage of the target.

4.10 ? menu

Help Topics

List help topics (refer to [11.9](#))

About CommonRADCase...

Display program information, version and copyright

4.11 Record panel

The record panel is used to control the recording and playback of Simulation and Visualization sessions. You can open the Record Panel in the [View](#) menu. If the application is in the Record mode, the signal values are recorded. In Playback mode the application runs a playback session of the recorded data. The recording can also be saved to a set of files and be loaded for later playback – see chapter [4.2.1](#).

The following features are available:

- Record
- Playback
- Save recording to a record-file
 - Automatic saving
- Open a record-file for playback
 - File menu
 - Drag on SIM/VISU and drop
 - Start SIM/VISU from command line with specified record-file

4.11.1 Record mode

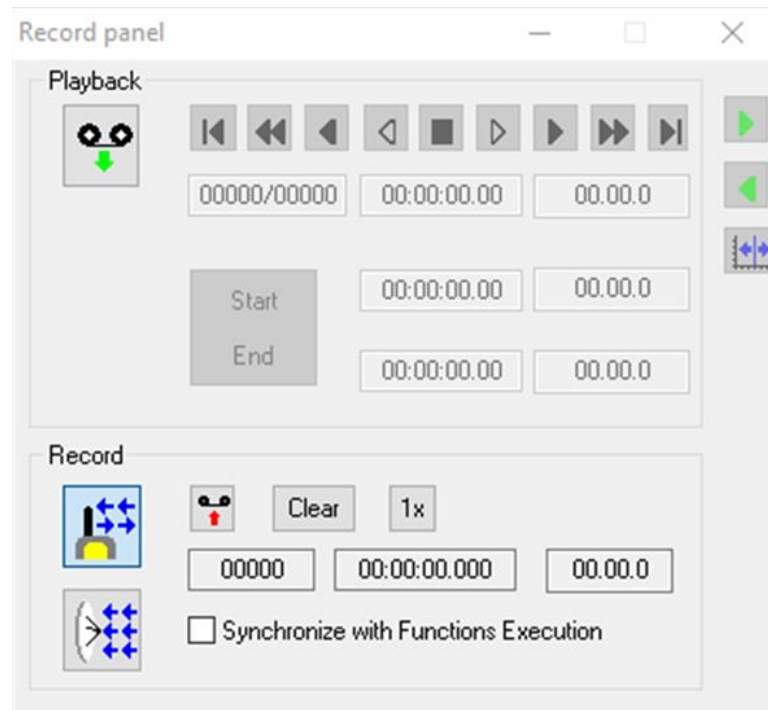


Figure 4-7, Record panel in Record mode

Starting from the left the following data are displayed in the Record panel when is activated the Record mode (see [Figure 4-7](#)):

- number of the current record
- time of the current registered record
- Date/Timestamp of the current record



Activates the Record mode. The communication between the recorder and the controller is established but the recording is not started.



Enables the Burst transfer mode. In the normal transfer mode, a handshake protocol is used for the communication between controller and Visualization. In the Burst transfer mode, the handshaking is omitted and the data is transmitted in a higher speed from the controller device.



Starts or stops the recording. The record mode needs to be activated before this command can be executed.



Deletes the recorded data.



Records one single record.

4.11.2 Playback mode

The following information's are displayed in this order when the Playback mode in the Record panel (see [Figure 4-8](#)) is activated:

- number of the registered record / total records
- time of the registered record
- date of the registered record

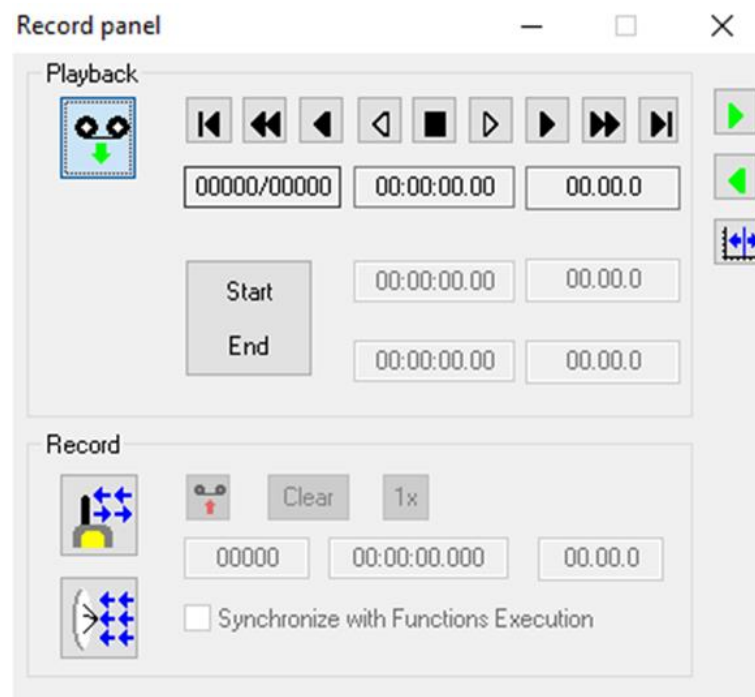


Figure 4-8, Record panel in Playback mode

By clicking on one of the numerical information fields, the playback Record selector dialog box is opened (see [Figure 4-9](#)).

This dialog box is used to set the cursor in the graphical display to the selected record number. See section [Graphical display of values](#) for details.

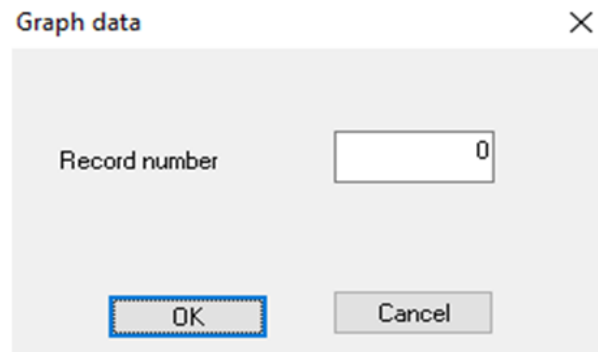


Figure 4-9, Record selector dialog

The following buttons on the Record panel can be used during the Playback mode:



Activates the Playback mode. The activation is also possible through the symbol bar.



Moves the Playback position to the first record.



Moves the Playback position 100 records backwards.



Moves the Playback position 10 records backwards.



Moves the Playback position 1 record backwards.



Stops playing.



Moves the Playback position 1 record forwards.



Moves the Playback position 10 records forwards.



Moves the Playback position 100 records forwards.



Goes to the last record.



Starts playing forward.



Starts playing backwards.



Controls the position of the cursor in the graphical display. If this option is set, then the cursor is fixed at left side of the graph and the curve will be updated accordingly. If the option is not set, then the curve for the value is fixed and cursor will be updated according to the simulated time during playback. See also section [Graphical display of values](#)

4.11.3 Record Panel Feature Notes

4.11.3.1 Record

For more detailed descriptions about this panel refer to [4.11.1](#).

To manually start or stop the recording activate the record mode and click on the  button.

4.11.3.2 Playback

To open a record-file for playback click on “Open...” in the file menu, described on [4.2.1](#). The currently opened record-file can be seen at the status bar (refer to [4.1.3](#)). Now the playback buttons described on [4.11.2](#) can be used.

4.11.3.3 Save recording to a record-file

- Manually:
At first some recording data must be recorded before (refer to [4.11.3.1](#)). To save the recording into a record-file use the “Save” or “Save as...” buttons described on [4.2.1](#). To customize the name or extension of the record-file refer to [11.5.1](#).
- Automatically: refer to [4.14.1](#) and [4.14.5](#)

4.11.3.4 Open a record-file for playback

- File menu (refer to [4.2.1](#)):
- Drag on SIM/VISU and drop:
 - Playback mode must be activated before (refer to [4.11.2](#))

- Simply drag and drop the record-file (*.rdf-file or with customized extension, refer to [11.5.1](#)) on to the SIM/VISU surface. The actual loaded file can be seen at the status bar (refer to [4.1.3](#)).
- Start SIM/VISU from command line with specified record-file
 - Refer to [8.4](#) to start the SIM/VIS via command line
 - Use the command line parameter "/REC_FILE" to open a record-file (refer to [8.5](#))
 - Example: "sim.bat /REC_FILE=C:\Temp\CusExtension\foo.xyz" will start the simulation with a defined record-file foo.xyz. To use a customized record-file extension refer to [11.5.1](#). The actual loaded file can be seen at the status bar (refer to [4.1.3](#)).

4.12 Main window

The main window is the representation of the project process. The process view can be also displayed in different hierarchical windows, depending on the application.

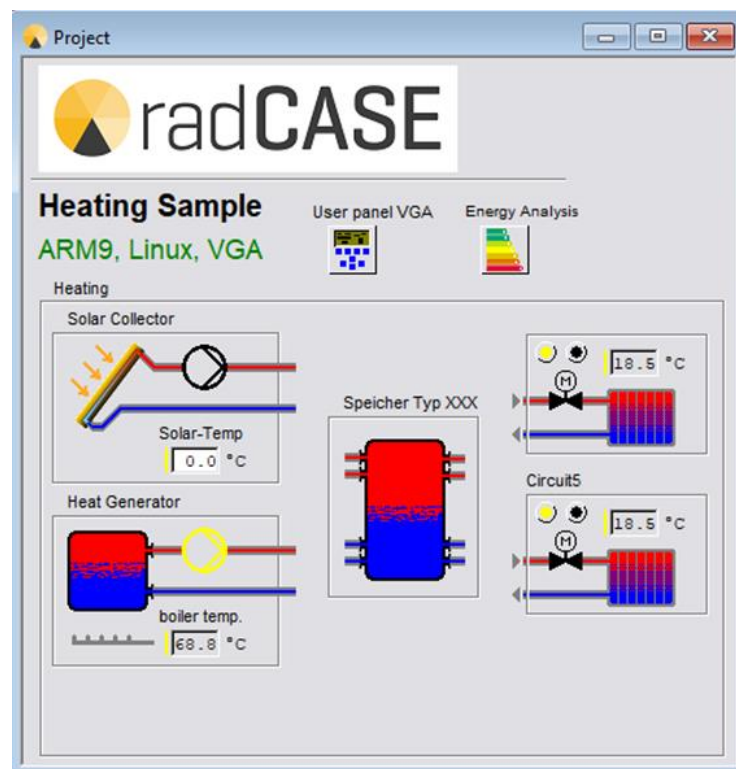


Figure 4-10, Main window

radCASE uses several different styles to display the type and state of values. Colored bars are used to indicate the type of the value. [Table 6](#) explains the usage of the colors in relationship with Elements types.





Colour	Display	Element type	Description
Magenta		PROC	Process Variable
Yellow		AI, AO, DI, DO, CNT	Inputs and outputs
Blue		PAR	Parameter
Blue/White		SYS	System Parameter

Table 6, Bars colours used to display Elements type

The background color is used to indicate the status of the value. The backgrounds showed in [Table 7](#) are used to distinguish between editable and non-editable values.

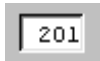


Display	Description
	Editable value
	Non-editable value

Table 7, Display of editable values

The following images with red backgrounds (see [Table 8](#)) are used to indicate out of range and alarm conditions.

Display	Description
	Value out of range (overflow)



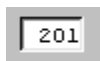
Value out of range (underflow)



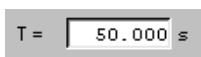
Alarm condition

Table 8, Display of alarm conditions

[Table 9](#) shows the examples of the additional display options.

Display**Description**

Editable value with a toggle editor



Value with description ("T = ") and unit ("s")

Table 9, Display options

There are also special values that can be displayed in combination with this. The **NoValue** (refer to **Reference Manual**) is shown as "-". An element which is not communicated (refer to **Reference Manual** for **ComType V0**) is shown with a value of "X".

4.13 Graphical display of values

In order to display values in a histogram, a surface with a **Melem** (see **Reference Manual**) has to be included in the radCASE Design. This surface should have an **ICON**, which opens in the Visualization or in the Simulation the following window:

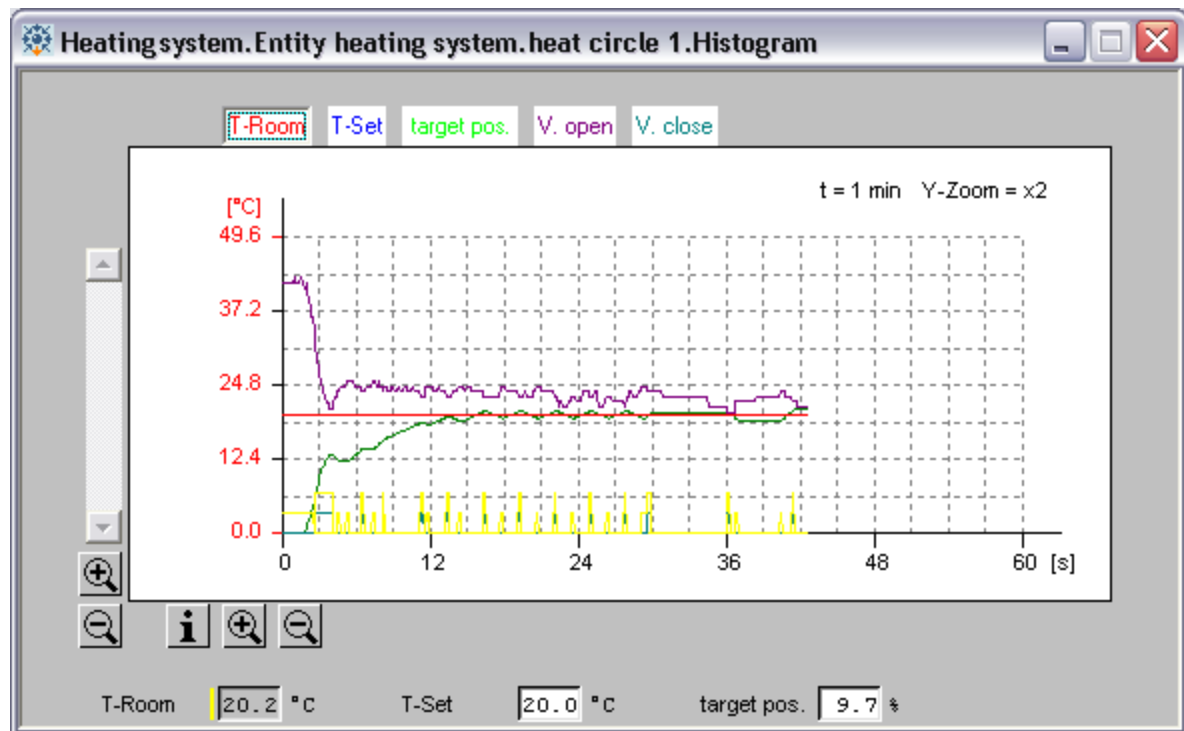
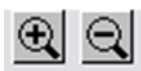


Figure 4-11, Value histogram

The following information is displayed:

- The legend directly above the graphic shows the colour attribution to the value names.
- The current zoom factors are shown right above the graphic. "Y-Zoom = x1" means that the y-axis is displayed with one fold magnification. The "x" has to be read as multiplication factor.

The following actions can be executed:



Extends/Minimizes the resolution in the respective time axis



Extends/Minimizes the resolution in the respective value axis



Opens an Info box to the value type whose scale is visible in this moment (this Info box contains for value types with finite numerous states also an explanation for these states)



During the time axis scrolling the playback mode of the registration panel has to be used (see [Playback mode](#)), because the illustration is chronologically connected with the current data record. This is marked in the graphic by a cursor (vertical black bar).

4.14 Recording options

There are several options that can be set for recording data using the menu **Setting > Recording settings**. The dialog box that appears is divided into five sections:

- Database
- ASCII-Export
- Sequence-export
- General export setting
- Recording

4.14.1 Database

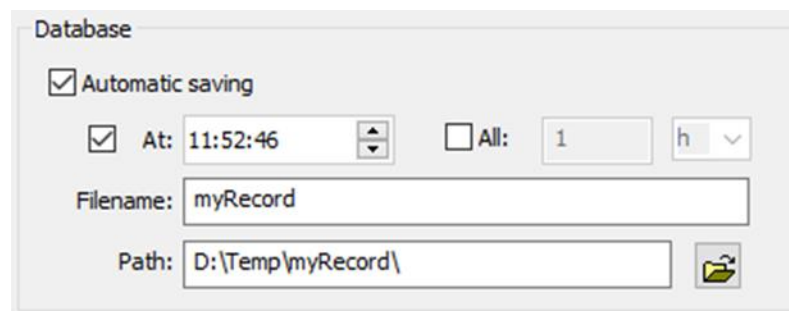


Figure 4-12, Record-Settings-Database

By enabling **Automatic saving** (see [Figure 4-12, Record-Settings-Database](#)) the recorded database is saved into a record-file, when the maximum number of records (**Desktop** setting **MR**, refer to Reference Manual) is reached. It is also possible to specify a time interval to trigger the saving. If the automatic saving is enabled the following options are available:

At	Time at which the automatic saving is triggered, if enabled. If not specified otherwise the recorded data is saved daily at the specified time.
All	Time interval for the data saving, if enabled. The saving interval can be changed for example from daily to every hour or weekly. If an interval is specified, the first saving will be done at the first possible time where a following interval will match the time specified in At . I.e. if it is entered At : 10:30 All : 2h and it is 9:20 the first saving will be 10:30 but if it is 7:20 the first saving will be 8:30, because after the next interval it will be 10:30 which is specified as start time.
Filename	The filename used to save the database without extension (*.rdf or any other customized extension will be added automatically). The filename can be composed also by variables, which will be replaced automatically: %T : Will be replaced by the time of saving in the format HHMM.

%D: Will be replaced by the data of saving in the format YYMMDD.

Note that existing record-files will be replaced without asking. So if any variable is used, there will be only one record-file with the last saved data.

Path

Path where to save the record-files. The Icon at the end of that line allows choosing a path.



Every time the automatic saving is triggered the current database will be emptied after saving.

If **Automatic saving** is disabled and the recorded database has reached the maximum number of records, recording is stopped and the following dialog box appears:



Figure 4-13, Error message for maximum data records reached with Automatic Saving disabled

4.14.2 ASCII Export

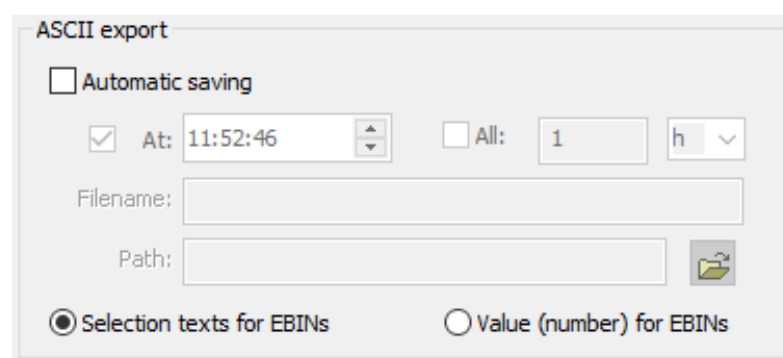


Figure 4-14, Record Settings – ASCII export

ASCII Export (see [Figure 4-14](#)) has the same option for **Automatic saving** described in section [Database](#). When Automatic saving is triggered a comma/semicolon separated file is created including the recorded data of all elements marked for ASCII-export with **ComType X<#>** (refer to Reference Manual for further details). The current database will be emptied only if no automatic saving is active for the database.

Additional options:

- The values of exported **EBINs** can be shown as digital values or as the selection texts of that **EBIN** (recommended in most cases).
- Refer to [General export settings](#)

After every ASCII-export the external file *export_post.bat* in the DEVELOP-directory is called, where further automatic processing of the exported CSV-File can be performed. The *export_post.bat* will get two arguments:

1. The filename including the path of the exported file. This is especially needed if the filename uses variables.
2. If the file is comma or semicolon separated (refer to [General export settings](#)).

4.14.3 Sequence-export

This option allows exporting the values of specified **ELEMENTS** at different times of the recorded data.

All elements	The sequence will contain all ELEMENTs of the project
Selection	The sequence will contain only the selected ELEMENTs that has been specified before (ComType S<#> ; refer to Reference Manual) in the design.
Always	The selection of ELEMENTs will be exported every time even if the value has not been changed.
Only on change	The selection of ELEMENTs will only be exported if it's value had changed.

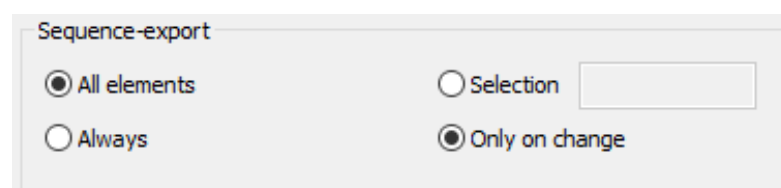


Figure 4-15, Record Settings – Sequence Export

4.14.4 General export settings

It is possible to choose between a commas separated file (needed for most Excel-versions) or a semicolons separated file (needed in German Excel-version). If set correctly, the generated CSV-file can be opened directly in Excel.

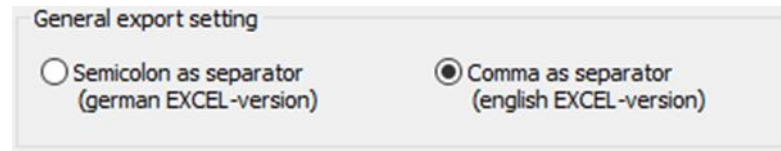


Figure 4-16, Record Settings – General export settings

4.14.5 Recording

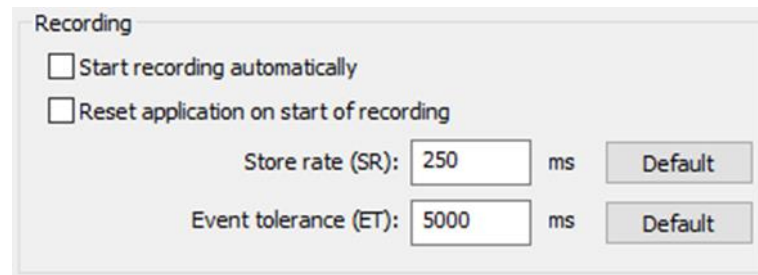


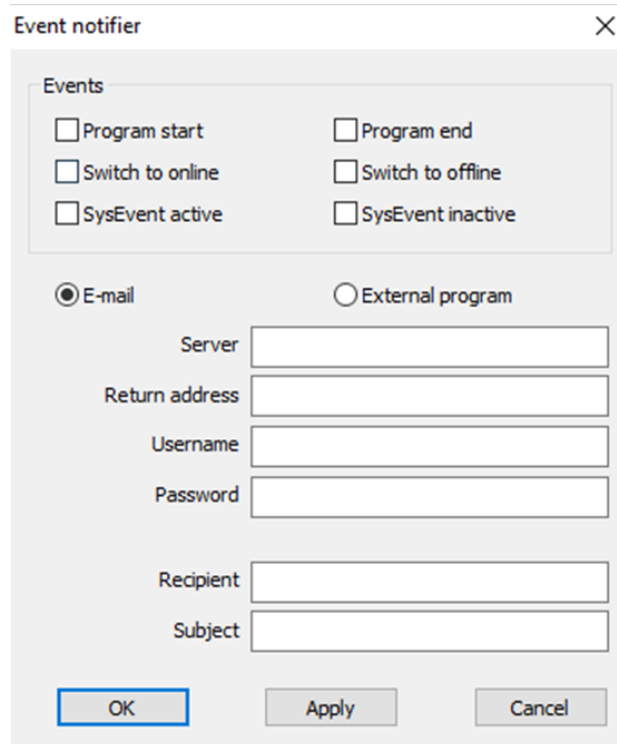
Figure 4-17, Record Settings – Recording

In this section (see [Figure 4-17](#)) there are general options for the data recording:

Start recording automatically	The data recording is started automatically as soon as the Visualization goes Online, the Simulation is started or an automatic saving is triggered. Because the recording isn't normally stopped when automatic saving is triggered, this only affects the cases where the user manually stops the running recording, or an error occurs and the recording is stopped (i.e. maximum amount of data recorded refer to desktop setting MR= described in Reference manual).
Reset application on start of recording	The application will reset on start of recording.
Store rate	The interval in which a dataset is recorded.
Event tolerance	The maximum time between to datasets to display the data as continuous graph. If this time is exceeded there will be a gap in the graph surrounded by rectangles to even see little gaps. The same behaviour of the graph can occur if the Offline limit is exceeded.

4.15 Event notification

By calling the menu **Settings > Event notifier** a dialog box (see [Figure 4-18](#)) that allows to set up the event notification.



The 'Event notifier' dialog box contains the following elements:

- Events section:** A group box containing six checkboxes:
 - ☐ Program start
 - ☐ Program end
 - ☐ Switch to online
 - ☐ Switch to offline
 - ☐ SysEvent active
 - ☐ SysEvent inactive
- Notification method:** Two radio buttons:
 - ☒ E-mail
 - ☐ External program
- Fields for E-mail notification:**
 - Server:
 - Return address:
 - Username:
 - Password:
 - Recipient:
 - Subject:
- Buttons:** OK, Apply, and Cancel.

Figure 4-18, Event notifier

The Events section allows to choose on which events the event notifier should trigger. It can trigger on starting and ending of the program, on changing of the Visualization to Online or Offline mode (note that Simulation is always online so it will only trigger “Switch to Online” at start of the program). Lastly it can trigger on **SysEvent** variables set in the design. **SysEvent** active will trigger every time one of the **SysEvent** variables changes its value to a value different than zero. The **SysEvent** inactive event will trigger when one of the **SysEvent** variables will change its value to zero. When one of these two events is triggered a list of the current values of **XE**-marked-elements is added in the text file (refer below). For further explanations of **SysEvent** variables and **XE**-elements refer to the reference manual.

When an event is triggered the text file “event.txt” is generated in the DEVELOP-directory. The created text can be changed by modifying the “Mail.txt” in the according Common directory. At the end of the file a list of the current values of the **XE**-elements is added. For each element a line (separated by `\n`) is created in the following format:

<Element description>:\t<element value>

or if a unit is specified:

<Element description>:\t<element value> [<unit>]

When enabling event notification by enabling an event trigger it is required to choose what action will be taken when the event is triggered. It can send an E-Mail or call an external program.

The E-Mail service needs the following information:

Server	Address of the email server used to send the mail, like smtp.mailserver.de or localhost or 192.168.0.1. Note that it is not possible to send mails using a server that only allows secure connection.
Return address	The address that is provided as sender address of the mail.
Username	Username needed to login into mail server.
Password	Password needed to login into mail server (if no password is needed may be left empty).
Recipient	Mail address the mail should be sent to. Can be multiple mail addresses by separating the mail addresses with comma (in this case enclose everything in quote signs: "recipient1@mailserver.com, recipient2@mailserver.com").
Subject	The subject for the e-mail.

The generated text file will be used as text of the e-mail.

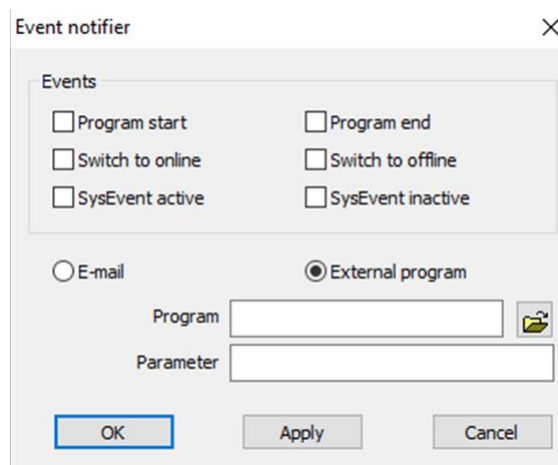


Figure 4-19, Event notifier – External program

When the option for calling an external program is chosen (see [Figure 4-19](#)), a program to call has to be selected (also by using the icon at the end of the line). If the program needs parameters they must be provided them in the **Argument** line.

E.g. with this option it is possible to call a program which evaluates the event.txt and executes further actions.

4.16 File transfer

Calling this command will open the following dialog:

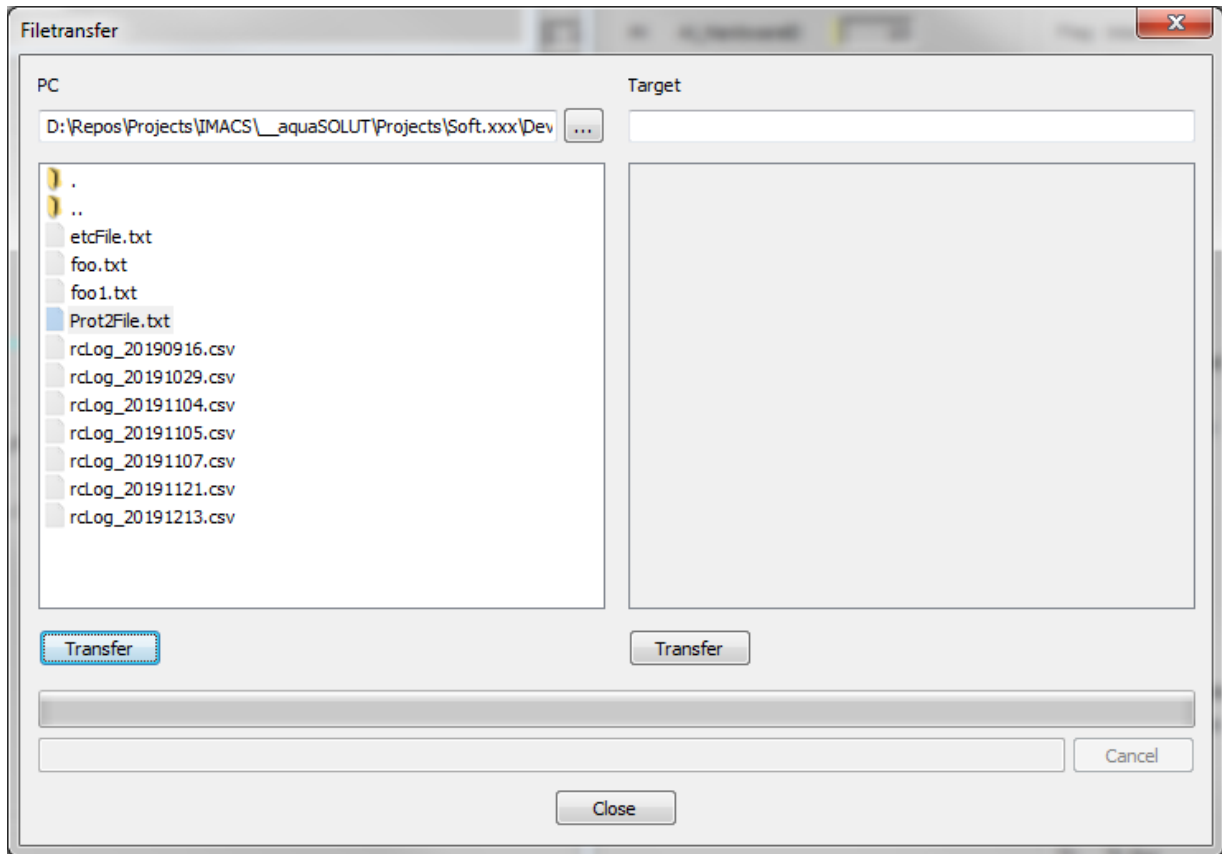


Figure 4-20, File transfer dialog

Like described in that dialog, the left side represents the PC side and the right side represents the Target side. It is possible:

- To transfer a single file from any directory of PC to the root directory of the Target's SD-Card
- To transfer a single file from any directory of Target's SD-Card to any directory on the PC



Note that it is not possible to transfer a file into any subdirectory of the Target's SD-Card.

4.16.1 Transfer file from PC to Target

On the left side of file transfer dialog browse into the correct directory and select the file, which should be copied to the SD-Card. Clicking the left Transfer-Button will start copying this file to the root directory of the SD-Card. If this file already exists, a dialog will appear:

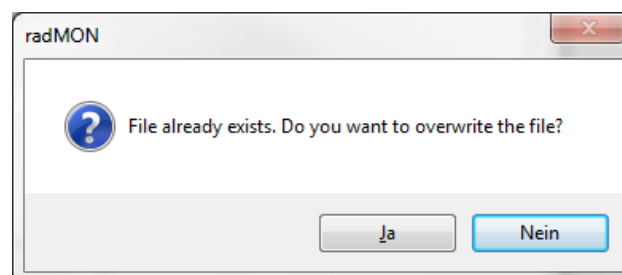


Figure 4-21, overwrite confirm dialog

4.16.2 Transfer file from Target to PC

On the right side of file transfer dialog, the full name of the source file must be typed in. Clicking the right Transfer-Button will start copying this file to the currently selected directory of the left PC side. If copying was successfully, the file is listed on the left side. If this file already exists, a dialog will appear (see [Figure 4-21, overwrite confirm dialog](#)).

The source file on the Target's SD-Card can be copied from any subdirectory. In case of not copying from SD-Card's root directory, the full name and path must be typed in. The following shows an example:

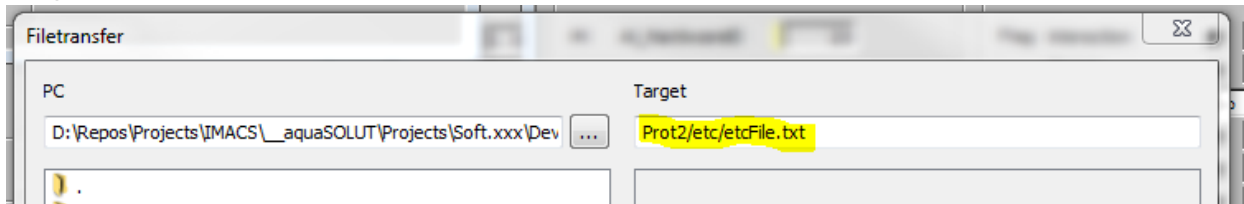
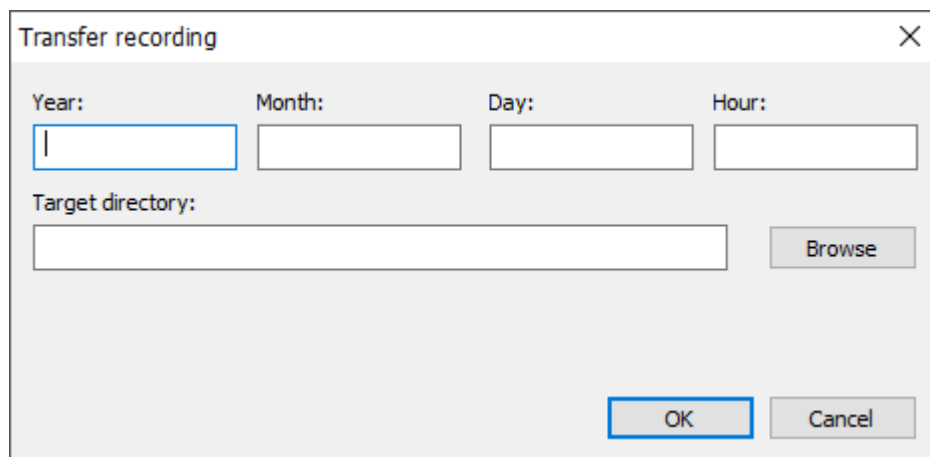


Figure 4-22, example of full path

4.17 Transfer recording

The command allows to transfer recordings made with *recording.rad* to the computer.



The file structure from target will be mirrored to the target directory. If the target directory does not exist, the directory will be created. Within the target directory wildcards can be used, to create different directories depending on the time of transfer:

- %a** Abbreviated weekday name in the locale
- %A** Full weekday name in the locale
- %b** Abbreviated month name in the locale
- %B** Full month name in the locale
- %c** Date and time representation appropriate for locale

- %C** The year divided by 100 and truncated to an integer, as a decimal number (00–99)
- %d** Day of month as a decimal number (01 - 31)
- %D** Equivalent to %m/%d/%y
- %e** Day of month as a decimal number (1 - 31), where single digits are preceded by a space
- %F** Equivalent to %Y-%m-%d
- %g** The last 2 digits of the ISO 8601 week-based year as a decimal number (00 - 99)
- %G** The ISO 8601 week-based year as a decimal number
- %h** Abbreviated month name (equivalent to %b)
- %H** Hour in 24-hour format (00 - 23)
- %I** Hour in 12-hour format (01 - 12)
- %j** Day of the year as a decimal number (001 - 366)
- %m** Month as a decimal number (01 - 12)
- %M** Minute as a decimal number (00 - 59)
- %p** The locale's A.M./P.M. indicator for 12-hour clock
- %r** The locale's 12-hour clock time
- %R** Equivalent to %H:%M
- %S** Second as a decimal number (00 - 59)
- %t** A horizontal tab character (\t)
- %T** Equivalent to %H:%M:%S, the ISO 8601 time format
- %u** ISO 8601 weekday as a decimal number (1 - 7; Monday is 1)
- %U** Week number of the year as a decimal number (00 - 53), where the first Sunday is the first day of week 1
- %V** ISO 8601 week number as a decimal number (00 - 53)
- %w** Weekday as a decimal number (0 - 6; Sunday is 0)
- %W** Week number of the year as a decimal number (00 - 53), where the first Monday is the first day of week 1

- %x** Date representation for the locale
- %X** Time representation for the locale
- %y** Year without century, as decimal number (00 - 99)
- %Y** Year with century, as decimal number
- %z** The offset from UTC in ISO 8601 format; no characters if time zone is unknown
- %Z** Either the locale's time-zone name or time zone abbreviation, depending on registry settings; no characters if time zone is unknown
- %%** Percent sign

The input fields Year, Month, Day and Hour can be used to limit the files transferred. If nothing is specified all recordings on the target are transferred. The resolution used on the target to store recordings can't be exceeded. Finer details will be ignored.

E.g. if the target stores recordings with a recording range of 1 month, the selected day and hour will be ignored and all recordings from the selected month are transferred.



The resolution of the target is detected by file structure. If changing the recording range on the target, any leftover files in the recording directory could lead to a false detection.

5 Visualization

This section deals with the commands, operations and settings used by the Visualization. It explains how to setup a connection between the Visualization application and the controller device. If a password is set up on the controller, a password dialog will be displayed during the connection establishment. For a modem connection the password dialog contains the controller identification.

5.1 Serial connection

To ensure connection over USB it is necessary to use a USB program adapter which connects to the PC USB Port and the 4-pin connector on your target PCB. The 4-pin connector port should look like shown in the following picture.



The power supply should be shut down while setting up connection. In the Visualization under **Settings menu / settings / select communication interface** the “serial” connection has to be chosen. After that the COM port needs to be configured in the **Settings menu / settings / configure communication interface**. If the COM port is unknown the Windows Device Manager can give insight where the USB adapter is connected to. When configuration was successful the Visualization should go online with starting the application on the hardware (see [VIS Online/VIS Offline/SIM](#)).

5.2 Ethernet/ TCP-IP connection

Establishing connection via Ethernet is rather easy. After connecting the PC Ethernet Port with the target PCB and choosing Ethernet connection in **Settings menu / settings / select communication interface**, the IP-Address of the controller needs to be configured in **configure communication interface**. When configuration was successful the Visualization should go online with starting the application on the hardware (see [VIS Online/VIS Offline/SIM](#)).

5.3 Modem connection

For those cases where a modem connection is used as communication means between Visualization and controller, the settings for the modem must be set in the Visualization application. The modem connection dialog is opened with the command **Modem connection** (see [Figure 5-1](#)) from the **Communication** menu.

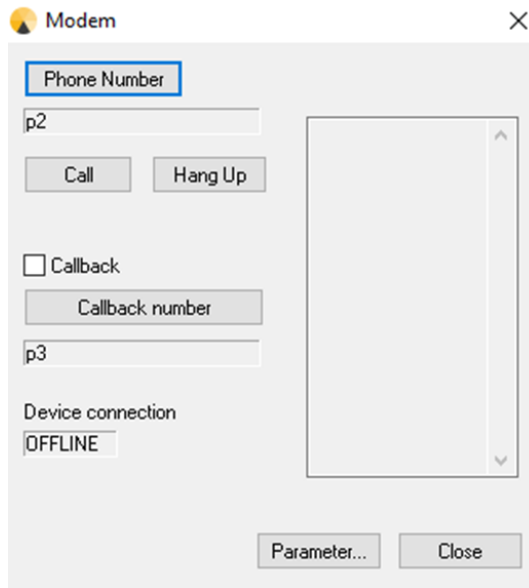


Figure 5-1, Modem connection

The following information's are displayed:

- phone number
- recall number
- device connection
- parameter
- state
- communication Interface

5.3.1 Modem directory

By clicking on **Telephone number** (see [Figure 5-2](#)) a new window is opened where the phone numbers can be inserted, modified and deleted (see [Figure 5-3](#)). Moreover, the dialing mode can be selected as pulse or tone. The selected phone number is memorized by confirming with **OK** for the next call.

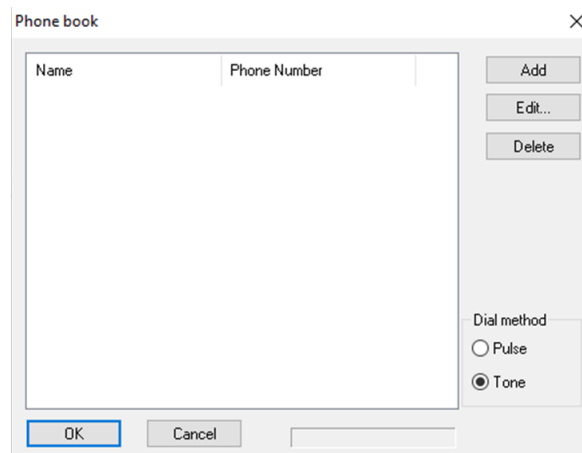
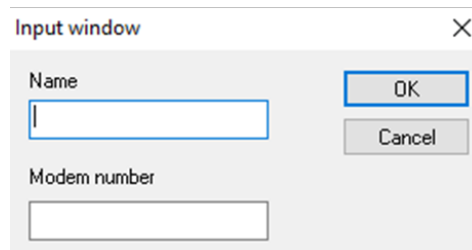


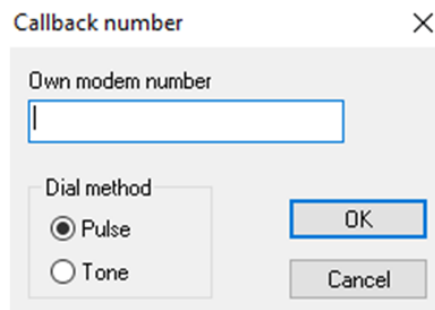
Figure 5-2, Selection window to add and modify the phone number



The 'Input window' dialog box contains two text input fields. The first field is labeled 'Name' and the second is labeled 'Modem number'. To the right of the 'Name' field are two buttons: 'OK' and 'Cancel'.

Figure 5-3, Input window for name and modem number

By clicking the button **Callback number** the phone number of the modem can be inserted and decided whether it should be called back using tone or pulse dialing (see [Figure 5-4](#)). The call back is only executed if it is activated in the selection field **Callback**.



The 'Callback number' dialog box features a text input field labeled 'Own modem number'. Below this field is a 'Dial method' section with two radio buttons: 'Pulse' (which is selected) and 'Tone'. To the right of the dial method section are 'OK' and 'Cancel' buttons.

Figure 5-4, Call-back number Dialog

5.3.2 Connection establishment

By clicking the **Call** button a connection to the inserted phone number is started. In case of a successful connection establishment "ONLINE" appears in the device connection field. If the recall option has been selected before, the modem hangs up after a successful connection establishment and is then called back by the modem of the remote station. The successful connection is shown by "ONLINE" in the device connection field.



Do not forget to close the connection after hanging up for terminating the connection.

5.3.3 Communication parameter

By clicking the button **Parameter** a window is opened (see [Figure 5-5](#)) for the modem selection parameters. Please read the possible parameters of the modem in its user manual.

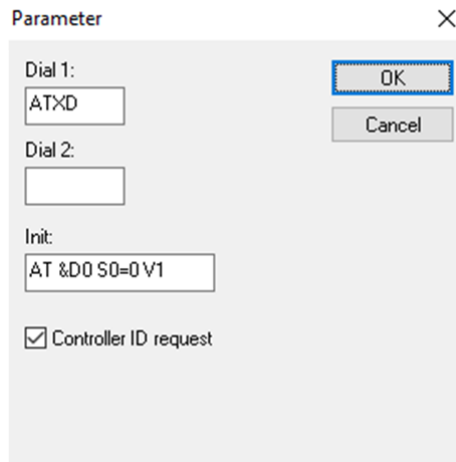


Figure 5-5, Modem parameter

The connection is terminated by clicking the **Hang up** button. This is indicated by “OFFLINE” in the device connection field.

Pay attention that the correct interface has been selected. It is shown in the right corner above the status window. To modify the interface, close the modem connection window and select the desired interface in the menu item interface settings (see [Settings](#)).

5.4 Remote Control

5.4.1 General information

In order to use the remote control, a communication connection between PC and controller has to be established (see [Serial connection](#), [Ethernet/ TCP-IP connection](#), [Creation of a modem communication](#)). Also the **user front window** has to be activated through the following icon in the main window (project window) inside the Visualization. This function is optional.



Opens the user front window.

5.4.2 The user front window in Offline mode

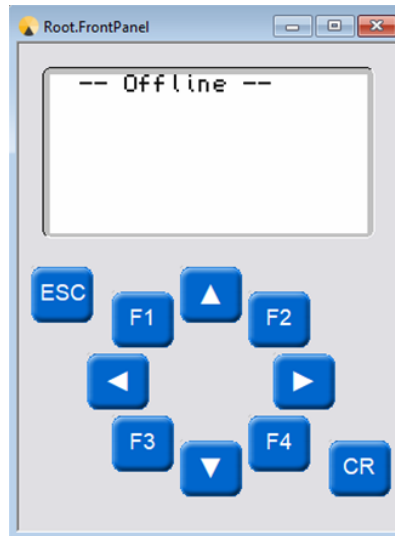


Figure 5-6, User front window in the Offline mode

If the user front window is opened without a connection to the controller, the writing “Offline” is shown in the Visualized display (see [Figure 5-6](#)).

5.4.3 The user front window in the online mode

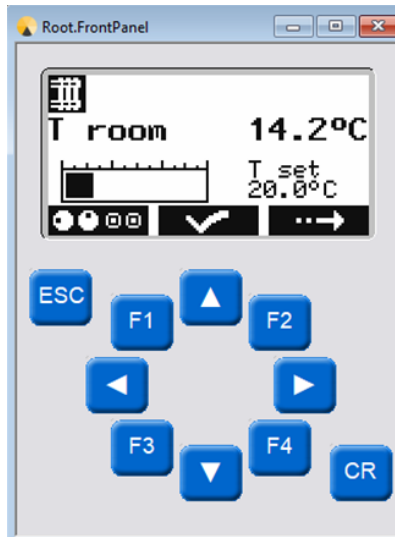


Figure 5-7, User front window in the Online mode

In the Online mode the user front display is the same of the user front of the controller. Also the button functions are analogue, i.e. the visualized arrow keys as well as <ESC> and <Enter> keys can be used by a mouse click or through the PC keyboard.



After using a key on the visualized remote control, the key input on the controller is blocked for about 10 seconds.

5.5 Connection errors

While establishing the connection radCASE checks if the target software matches the Visualization. The following errors may occur if the software does not match the Visualization:

Error-Message	Description
Wrong size of parameter data.	The size of the parameters is different between target and Visualization. This normally happens because of a new or deleted parameter or because of a changed data type.
Wrong version of parameter data.	The version set by the Define VERS_PARAM is different between target and Visualization.
Wrong device ID of parameter data.	The version set by the Define DEVICE_ID is different between target and Visualization.
The software versions of target und Visualization do not match.	The version of the software set in Systemdef->Version is different between target and Visualization.
The versions of calibration data structure of target and Visualization do not match.	The version set by the Define VERS_KALI is different between target and Visualization.
The versions of the system data structures of target und Visualization do not match.	The version set by the Define VERS_SYSTEM is different between target and Visualization.
The versions of process data structures of target und Visualization do not match.	The version set by the Define VERS_PROC is different between target and Visualization.

Table 10, Connection errors

In all of these cases the Visualization will continue working and try to assign the data provided by the target with the data of the design.

6 Simulation

6.1 Time laps and execution modes

It is possible to activate a time scale factor for the Simulation in order to run the process simulation in a quicker time. This can be chosen in menu **Simulation → Time laps**. The following values are possible:

1x	Normal execution speed, i.e. 1 second in the Simulation corresponds to 1 second in the normal device.
5x	5 fold execution speed, i.e. 1 second in the Simulation corresponds to 5 seconds in the normal device.
10x	10 fold execution speed, i.e. 1 second in the Simulation corresponds to 10 seconds in the normal device.
25x	25 fold execution speed, i.e. 1 second in the Simulation corresponds to 25 seconds in the normal device.

6.2 Single step mode

In single step mode the perm task, the inter task and the surface interpreter task are synchronized. A single step will perform the following steps:

- Check for a sequence with the right timestamp, set the according values to the elements and increase the internal timer (only if a sequence is selected; refer to [Sequence processing](#))
- One run through all of the tasks, in the order Inter task, Perm task, Surface interpreter task.
- Receive values from the simulated target
- Send values to external tool (if an external tool is connected; refer to [Using ITC Interface \(Inter Tool Communication\)](#))



The surface interpreter task is not fully supported. Entering loops in the surface interpreter task (e.g. standard edit dialogs) will cause a deadlock.

When activating the single step mode using **Simulation → Execution Mode → Single Step Mode** On the simulation will go into a paused state. In this state single steps can be executed by selecting **Simulation → Execution Mode → Next Single Step**. When selecting **Simulation → Execution Mode → Run/Stop Single Steps** the single steps will be executed without pause between the steps. This mode is mainly useful when combined with [Sequence processing](#) and/or [Using ITC Interface \(Inter Tool Communication\)](#)

6.3 Sequence processing

Sequence processing is a way, to feed a sequence of element value changes into the simulation to be executed on specific times. The sequence processing is only supported in conjunction with the [Single step mode](#).

With **Simulation → Sequences → Open Sequence** a sequence can be loaded into the simulation. The sequencer supports two file formats:

1. A CSV-file which can be generated with Excel. The CSV file need to have the following columns: <Timestamp>,<element name>,<value>,<command>
2. A txt-File in the format: <Timestamp> <element name> <value> <element name> <value> ...

The Timestamp has to be in the format seconds.centiseconds (e.g. 1.3).

The Elementname has to be the full path to the element as specified in struct.lst. The value has to be in the internal format of radCASE as it is contained in the underlying C-variables.

Currently the only supported command is “EndSequence”. Every line following the EndSequence command is considered a new sequence. In a txt-File an empty line is considered as separator for a new sequence (the timestamp for that new sequence would be the next step after the last timestamp in the sequence). When reaching the time stamp of the EndSequence-Command. The next sequence is executed.

When opening a sequence the single step mode will automatically be activated.

While running through a sequence an internal timer is kept which is used for evaluation of the timestamp. For each single step, this internal timer is increased by the Intertask-rate set in the project.

7 For Developers

This section describes how to use the radCASE Simulation and Visualization tools to respectively start the PC simulator or run the application on the final target and perform a real-time monitoring.



radCASE not only uses the COM (serial) interface of the host PC during Visualization but also it is possible to establish communication via Ethernet. Best practice is to use a USB-2-serial or USB-2-Ethernet adapter. Please make sure that these interfaces are available for radCASE and not used by other applications.

7.1 Starting Simulation and Visualization

The Simulation and Visualization are started from the radCASE IDE. It is also possible to create a standalone version of the Simulation or Visualization, which can be distributed to customers who do not have a radCASE license.

In order to update the Simulation and Visualization with the current design, at first the **Design Compilation** and **Create Simulation** must be executed (see IDE Manual or Reference Manual).

7.1.1 Simulation

The Simulation is started with the command **Build menu > Start simulation** (see [Figure 7-3, Start of Simulation from Build menu](#)).


The Simulation can also be started from the Simulation toolbar (see [Figure 7-1, The Simulation toolbar](#)) by clicking the button .



Figure 7-1, The Simulation toolbar

7.1.2 Visualization

The Visualization is started with the command **Build menu > Start visualization** (see [Figure 7-4, Start of Visualization from Build menu](#)).


The Visualization can also be started from the Visualization toolbar (see [Figure 7-2, The Visualization toolbar](#)) by clicking the button .



Figure 7-2, The Visualization toolbar

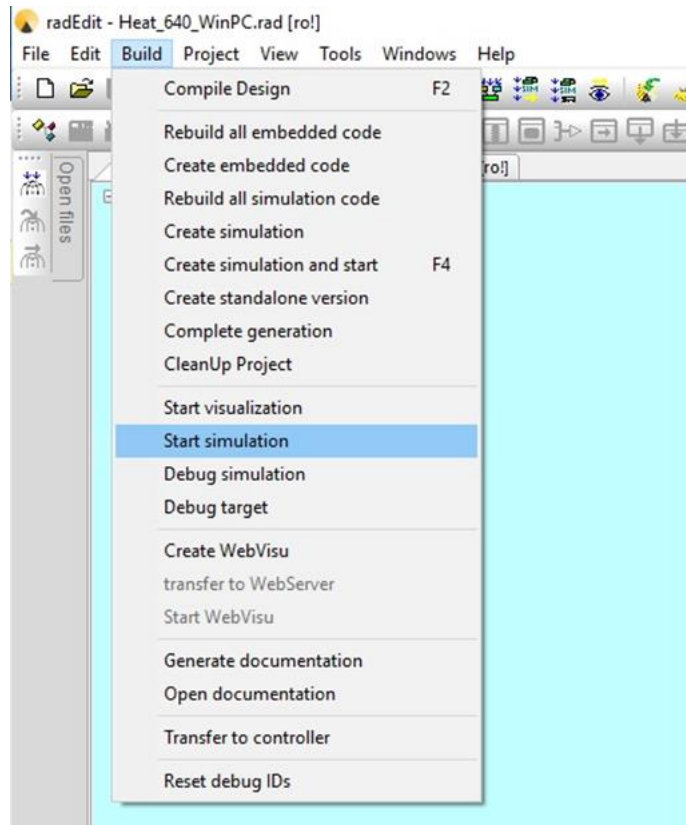


Figure 7-3, Start of Simulation from Build menu

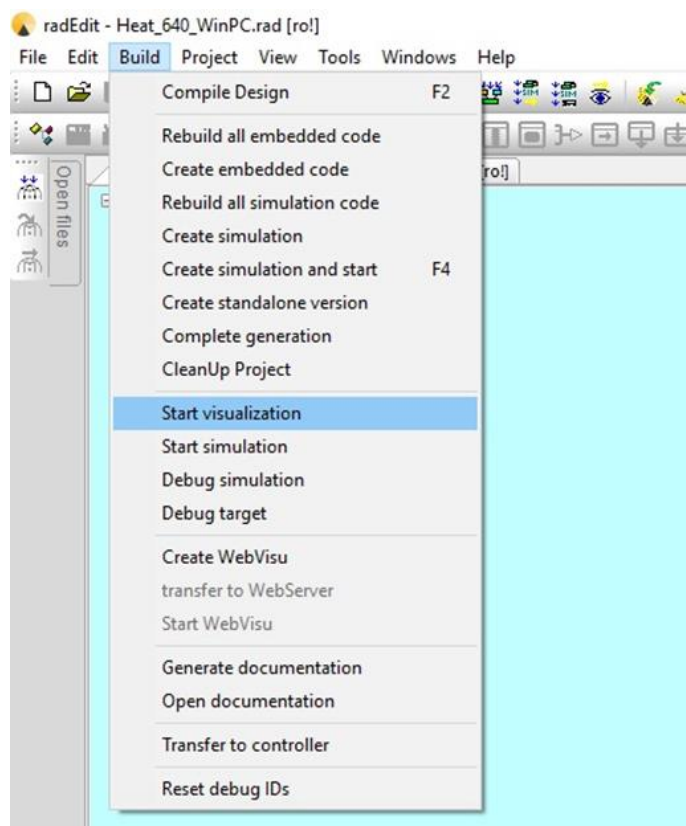


Figure 7-4, Start of Visualization from Build menu

7.2 Creating standalone Visualization and Simulation applications

It is possible to create a standalone version of the Simulation or Visualization running on computers where no radCASE environment is installed.

To create such standalone applications, follow the instructions reported in section [Creation of standalone applications](#).

Then, Simulation starts by executing the *sim.bat* file in the Simulation software directory. In the same way, the Visualization starts with the *vis.bat* file always in the Simulation software directory.

8 Creation of standalone applications

8.1 Manual creation

To create a standalone Simulation or Visualization, open the *standalone.bat* file in the develop directory of the project. The name *standalone.bat* is because Simulations and Visualizations are often created for clients.

During the start of the batch file *standalone.bat* it is possible to determine optionally two parameter operations:

1. The first parameter determines the *target path* for the directory with all the necessary files for the Simulation/Visualization.
2. The second parameter copies all the necessary DLLs in the target directory of the Simulation/Visualization.

8.1.1 Usage of the *standalone.bat* file WITHOUT parameters

The file is started by a double click (e.g. from the Windows-Explorer). A directory *\STANDALONE* is created automatically in the project directory (e.g.: *C:\Program Files\radCASE\Projects\heating\STANDALONE*), which contains all the files for the Visualization/Simulation. The necessary DLLs are NOT contained here. In such case, the **Microsoft Redistributable Packages** has to be installed.

Example:

Double click on *C:\Program Files\radCASE\Projects\heating\Develop\standalone.bat*

8.1.2 Usage of the *standalone.bat* file WITH parameters

```
standalone.bat /t <path> /d
```

If only the parameter is indicated with */t*, the target path for the client directory is indicated afterwards, separated by a space.

Example:

```
standalone.bat /t C:\Client_Project1
```

The client directory was named here *Client_Project1*. All files for the Simulation/Visualization are copied in the directory *C:\Client_Project1* in the same way as without the parameter. The necessary DLLs are NOT contained in this execution of *standalone.bat*, as well.

If only the parameter */d* is indicated, the client directory is created in the same way as WITHOUT the parameter. All necessary DLLs are copied in the *\STANDALONE* directory in this case. The installation of **Microsoft Redistributable Packages** is not necessary here.

Example:

```
standalone.bat /d
```

If both parameters are used, the target directory is determined where all the files for the Simulation/Visualization and all the necessary DLLs are copied in.

Example:

```
standalone.bat /t C:\Client_Project1 /d
```

In the created directory a license file is required:

Copy therefore the *visual.lic* file from the *\Develop* directory into the *\win* directory under the directory created before by *standalone.bat* (without parameter: *\STANDALONE\win*; with command line parameter in the defined folder, e.g. with parameters */t C:\Client_Project1* into *C:\Client_Project1\win*).

8.2 Automatic creation

All the steps described above can be skipped by using the “Create standalone version” command in the radCASE IDE menu (see [Figure 8-1](#)) or according button in the simulation toolbar (see [Figure 7-1, The Simulation toolbar](#)). The *standalone.bat* will be executed automatically with all the needed parameters and all the needed files will be copied into the automatically created *\standalone*-folder in the project directory.



create standalone application

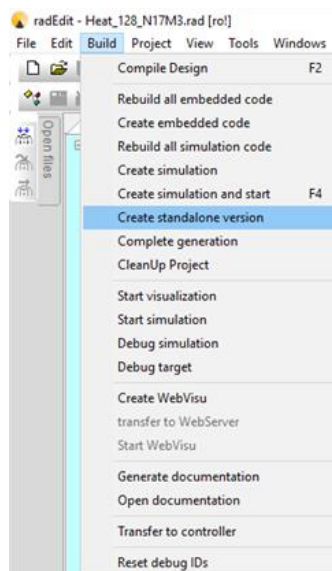


Figure 8-1, Build Menu – Create standalone version

8.3 Embedding of project specific files in the client index

To copy the project specific files, the batch file *standalone_prj.bat* in the development directory of the radCASE-Project can be adapted.

Example:

```
SET TARGET1=%1\bmp
copy ..\osdl\imacs_lib\*.bmp %TARGET1%
copy ..\osdl\srg_global\*.bmp %TARGET1%
copy ..\osdl\srg_global\ctr\*.bmp %TARGET1%
copy %osdl_sys%\Lib\global.win\*.bmp %TARGET1%
copy %osdl_sys%\Lib\global.ctr\*.bmp %TARGET1%
copy %osdl_sys%\Lib\global.ctr\big_bitmaps\*.bmp %TARGET1%
```

```
copy %osdl_sys%\Lib\wasser.win\*.bmp %TARGET1%
copy %osdl_sys%\Lib\elektro.win\*.bmp %TARGET1%
copy %osdl_sys%\Lib\digital\*.bmp %TARGET1%
copy %osdl_sys%\Lib\analog\*.bmp %TARGET1%
copy %osdl_sys%\Lib\mixed\*.bmp %TARGET1%
```

The variable TARGET1 gets the target directory from the *standalone.bat* parameter (if necessary). If the *standalone_prj.bat* file does not exist, *standalone.bat* is working anyhow. In this case the client directory does not contain the project specific files, which usually cause problems in the Simulation/Visualization execution.



Before creating independently operating Visualizations and Simulation, compile these projects without any errors in radEDIT.

See *Design compilation and Simulation creation* in the Reference Manual.

8.4 Start Simulation/Visualization from command line

The Simulation can be executed from the created client directory through the batch file *sim.bat* in the \SIM directory.

In the same way Visualization can start from the created client directory through the batch file *vis.bat*

8.5 Command line parameters

The following command line parameters are available to be passed to *sim.bat/vis.bat*.

Parameter	Description
/PW=<password>	Start monitoring with password level identified with given password
/LANG=<langcode>	Start with selected language; supports the languages which can be selected in the visualization (LV=)
/REC_FILE=<filename>	Open selected record-file on starting of monitoring
/MAXIMIZED	Start monitoring with maximized main window
/DIS_SYSKEYS	Disable system keys/key combinations CTRL+ESC, ALT+TAB, ALT+ESC, ALT+F4, Windows key as long as monitoring is active.
/COMDLL=<DLL parameters>	Refer to Communication configuration

Table 11, command line parameters

8.5.1 Communication configuration

The communication interface can be configured by the command line parameter **/COMDLL=<DLL parameters>**.

The DLL parameters select and configure the DLL used for communication. If the parameters contain spaces, the parameters must be put in quotation marks (see examples below).

The parameters contain the filename of the communication DLL and an optional configuration. If no configuration is provided the configuration is determined in the order described below. If a configuration is provided the file name and configuration are separated by a colon.

radCASE provides the following communication DLLs:

cclConnection.dll:

By selecting **/COMDLL=cclConnection.dll** a serial connection is used to connect to the target controller. The configuration contains of multiple parameters separated by a space. If a parameter is not provided a sane standard value will be chosen:

- **C<port>**: Selects the COM-Port to use. Default value is C1 for COM-Port 1
- **B<baudrate>**: Selects the baudrate for the connection. Default value is B115200
- **D<databits>**: Selects the databits for the connection (7 or 8 databits). Default value is D8
- **P<parity>**: Selects the parity where 0 is no parity, 1 is odd parity and 2 is evenparity. Default value is P0
- **S<stopbits>**: Selects the stopbits, where 0 is one stopbit, 1, is 1.5 stopbits and 2 is two stopbits. Default value is S0

So a configuration could look like: **/COMDLL="cclConnection.dll=C1 B115200 D8 P0 S0"**

cclConnectionEth.dll

By selecting **/COMDLL=cclConnectionEth.dll** an Ethernet connection is used to connect to the target controller. The configuration contains the IP address of the target controller, e.g.:

/COMDLL=cclConnectionEth.dll:127.0.0.1

The selected communication interface and configuration can be changed at runtime using the according dialogs. At the start of the project monitor, the communication interface is selected in the following order, using the first provided configuration found.

1. Communication interface selected by command line parameter **/COMDLL**
2. Communication interface that was active the last time project monitor of the project ran
3. Standard communication interface selected by Timing parameter CD in design
4. Selection dialog
5. No selection (if selection dialog was aborted, no communication interface is selected)

The configuration at start of project monitor is selected in the following order, using the first configuration found:

1. Communication configuration selected by command line parameter **/COMDLL**
2. Configuration that was active the last time the project monitor used that communication interface (saved separately for every communication interface)
3. Configuration dialog
4. Standard values provided by communication DLL.

9 Debugging

In order to debug the application with the Microsoft Visual C++ environment, the steps described in the following sections are required.



This description exclusively refers to Microsoft Visual C++ .NET.

9.1 Select project

First of all the project to be analyzed has to be selected (e.g. `..\Projects\heating`).

Afterwards open the file `..\Projectname\Sim\sim.sln` by a double clicking the file (see [Figure 9-1](#)).

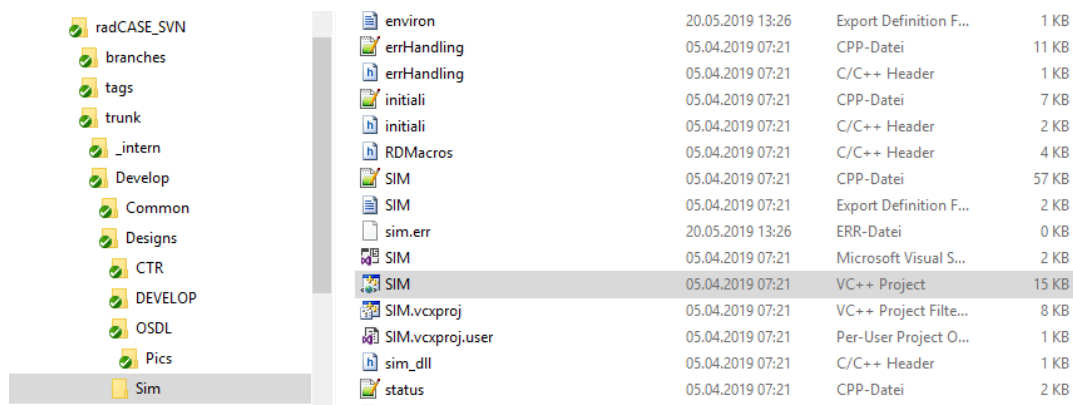


Figure 9-1, Selection of directory and file

9.2 Microsoft Visual C++ development environment

The Microsoft Visual C++ development environment is opened and the necessary project folder is already downloaded.

Please check that the development environment is set on **Debug**.

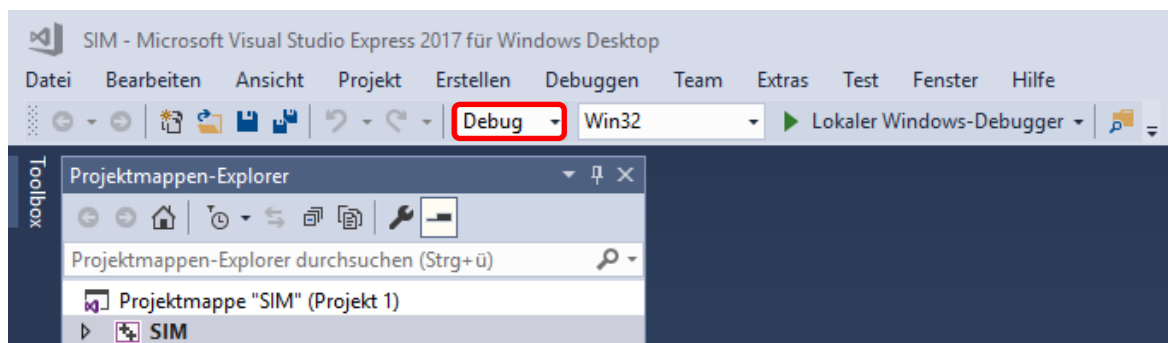


Figure 9-2, Set Debug

The project tree is in the left area of the development environment. In this section **SIM** has to be selected in order. Then open the context menu with right mouse key and select **Properties**.

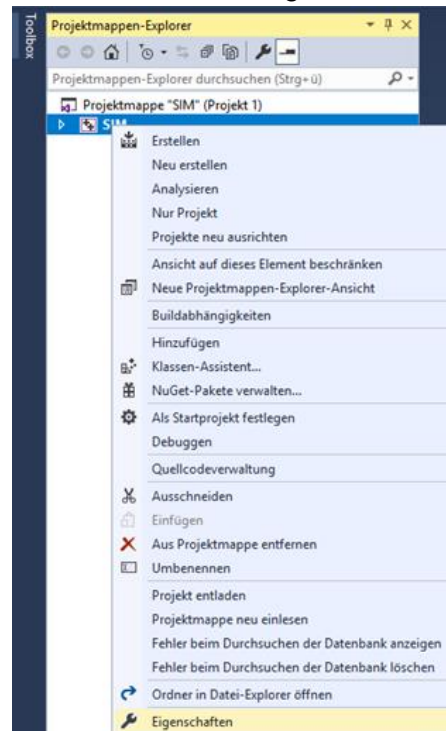


Figure 9-3, Context menu

9.3 Properties page

Please select **Debugging** in the left section of the properties page (Explorer section).

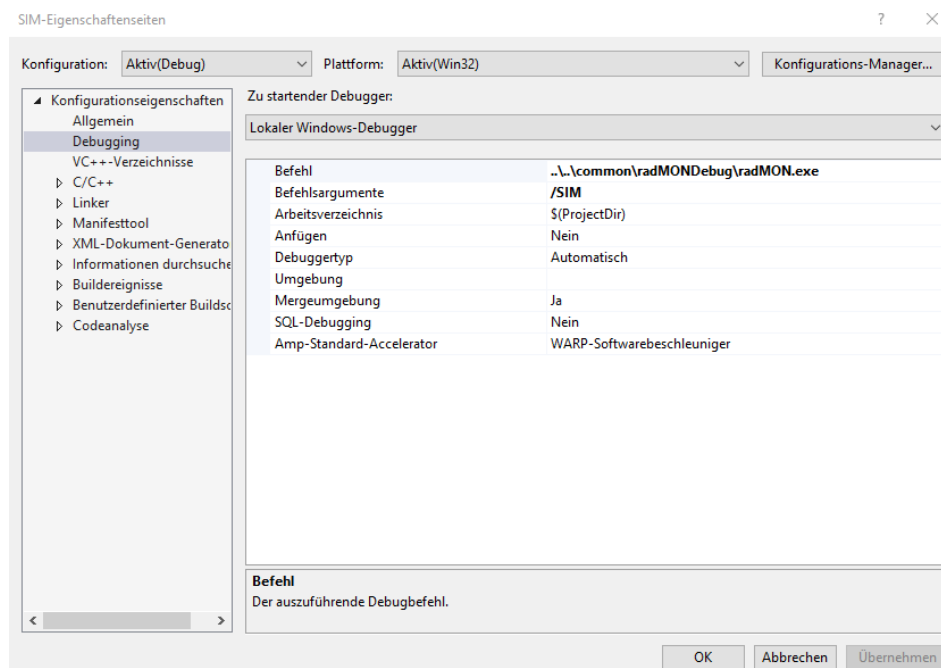


Figure 9-4, Properties page

9.3.1 Command

In the **Command** field set the path and the file name of the *Common.exe*.
Then open the input field and select **Browse...**

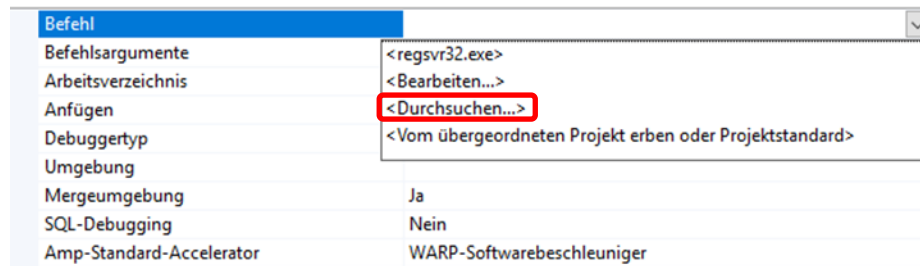


Figure 9-5, Command



Please pay attention that there are a Debug and a Release version of the *Common.exe* file.
It is absolutely necessary to use the Debug Version!

Example:

C:\radCASE\Projects\common\debug\Common.exe

9.3.2 Command arguments

Please insert **/SIM** in the command arguments field.

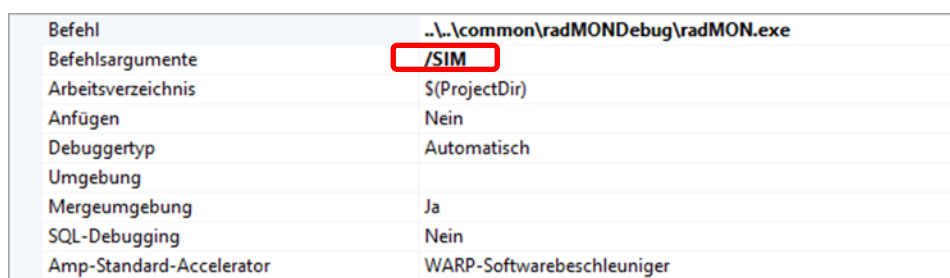


Figure 9-6, Command matters

The dialog **SIM Property pages** can be closed now by clicking **OK**.

9.4 Debugger operating

A **Debug toolbar** is needed to set breakpoints and to start the debugger.

To add a Debug toolbar put the mouse on the menu bar and right click to open the context menu, then select the option **Debug** (see [Figure 9-7](#)).

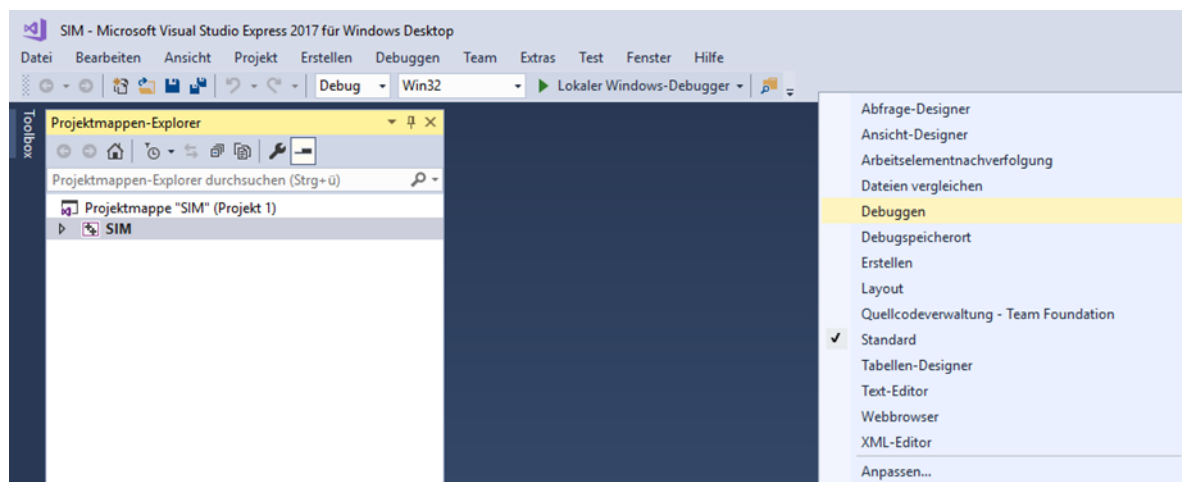


Figure 9-7, How to add a Debug toolbar



Figure 9-8, Debug toolbar

By clicking the green arrow the debugger is started.

It may be that the following advice appears:

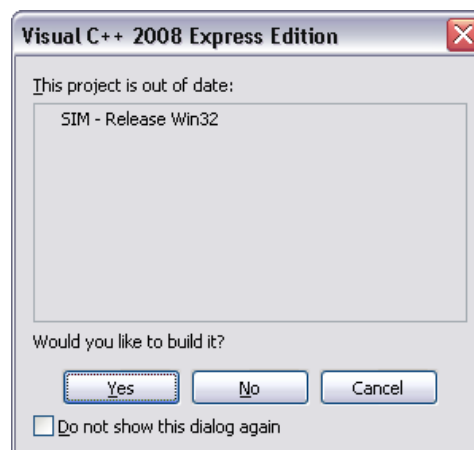


Figure 9-9, Report of the Microsoft development environment

The question on Project out of date (see [Figure 9-9](#)) should be answered by clicking **Yes**. The advice on symbolic information (see [Figure 9-10](#)) has to be answered with **OK**.

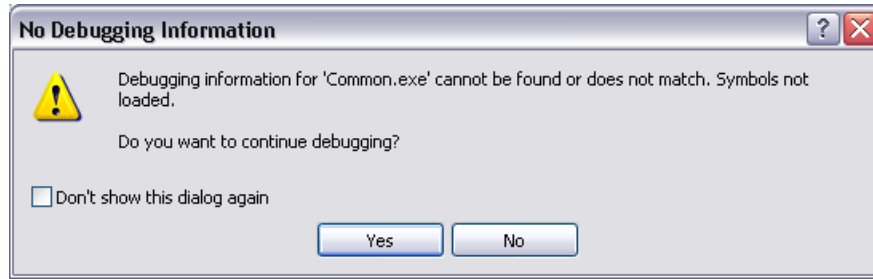


Figure 9-10, Report: no symbolic information for Common.exe

Afterwards the Simulation starts.

To set a breakpoint before the Simulation starts, select a file in the Explorer section on the left.

Open **Source Files** in the **SIM** project folder.

Here are the source files that can be analyzed.

The functionality which is assembled by radCASE in a C file is located in *module.c*.

It can also be that the *usercode.c* file has to be analyzed.

10 Using ITC Interface (Inter Tool Communication)

The inter tool communication interface is an interface for executing [Sequence processing](#) in [Single step mode](#) from an external application. The interface also provides data exchange to get current values of the elements in the simulation. The interface is meant for automatic testing by providing and executing sequences of data changes and checking the resulting element values.

The communication between the Project monitor and the external application relies on Windows messages (SendMessage/PostMessage). For a communication using windows messages a handle to the windows of the other application is needed. For this the Project monitor has registered the class "radCaseCommon", which can be found using FindWindow(). The external application has to register a window class with the name "radCheck".

10.1 Available commands

The following commands are available for the external application to send to the Project monitor:

10.1.1 Execute single step

By sending the signal WM_USER + 13 to the Project monitor a single step as specified in [Single step mode](#) is executed. This message should be send using PostMessage. After execution of the single step the project Monitor will send back the new element values after the step. Refer to [Receiving data](#).

The WPARAM can contain a number. Any number not equal to 0 will select the sequence with the according number. 0 will execute the next step of the current active sequence.

0 will execute the next step of the current active sequence.

10.1.2 Get current data

By sending the signal WM_USER + 14 the current data of all elements will be requested. This will only cause the project monitor to send back data and not execute any step. (Refer to [Receiving data](#)).

10.1.3 Open a sequence

By sending the signal WM_COPYDATA the external tool can request the project monitor to open a sequence from a file. For this dwData has to be 1, lpData has to contain a Unicode string containing the path and filename of the file, cbData has to contain the size of the string in bytes.

10.2 Receiving data

To send the data from the project monitor to the external tool, the Project monitor will send a message using WM_COPYDATA. Because WM_COPYDATA sends a pointer to local data of the project monitor, this means the project monitor has to wait blocking for the signal to be processed. It is advised to only copy the data and use some kind of signal to process the data in another thread.

The data will have the following format:

4 Bytes: Current timestamp in sequence execution in milliseconds

2 Bytes: Size of IO data

2 Bytes: Size of flag data

2 Bytes: Size of parameter data

2 Bytes: Size of system parameter data

2 Bytes: Size of process data.

After this the data of the blocks follows in the same order like the sizes in the header. The data itself is communicated in the same format as for the Imacs Protocol between target and Project monitor (refer to Imacs-Protocol documentation). Currently communication of string elements is not supported.

A timestamp of -1 means there is currently no sequence active (either no valid sequence was loaded or the last sequence has ended). A time stamp of 0 means a new sequence was loaded).

11 Appendix

11.1 Alternative connections between controller device and Visualization

API dependent.

This item is described in a separated manual.

11.2 Simulation and Visualization license

The file *visual.lic* has to be present in the directory *DEVELOP*. This file contains the unblocking to create and execute the Simulation and Visualization. The *visual.lic* is generated by the model compiler during model compilation and copied to the *DEVELOP*-directory. It should be ensured, that access rights are given.

For the transfer of the Simulation and Visualization to a third party, the *visual.lic* file is necessary (refer to).

11.3 Creation of a modem communication

1. Condition for a modem connection between controller and Visualization PC is an operating connection hardware, i.e. both device and PC need a modem, which can be connected to others via phone device and/or telephone line. The two modems (on the Visualization PC and on the controller) need to have the same baud rate (e.g. 56k Baud).
2. Moreover, the controller, the Visualization PC and the modems have to be switched **ON**.
3. The Visualization software has to be started on the Visualization PC.
4. In **Settings menu** select the correct interface to the modem in the item interfaces.
5. In **Communication menu** select the settings for the connection establishment, like phone numbers and recall function through the modem item. There it is possible to initiate the connection establishment through the button call as well.

11.3.1 Modem list

In order to guarantee a steadily operation, it is recommended to use the same modems on both communication sides with a data rate of 56k Baud.

The following modems had been tested successfully for the Visualization:

Producer	Modem type
U.S. Robotics	3COM U.S. Robotics 56k Voice Faxmodem
ELSA	ELSA Microlink 56k Fun
ACER	ACER Modem 56k surf
COMTIME	SIM – V.92 (Socket-Modem to install)

Table 12, Supported modem

The following modems are not supported (do not use):

Producer	Modem type
ELSA	ELSA Microlink 56k

Table 13, Unsupported modem

11.4 Manipulation and initial state

The following tables show the manipulation possibilities as well as the initial state of the elements for the Visualization and Simulation.

11.4.1 Editing data during Visualization

AssignType	Editability
AI	If force mode is activated
AO	If force mode is activated
DI	If force mode is activated
DO	If force mode is activated
TI	No
CNT	If force mode is activated
SYS	No
PAR	If (Editing mode in VisElem != "without")
OUT	No
IN	Yes
FLAG	If (Editing mode in VisElem != "without") (generally only possible if communication Flag)
STAT	No
PROC	If (Editing mode in VisElem != "without")
LOCAL	If (Editing mode in VisElem != "without")

KEY	Yes, is transferred as key operating to the target surface interpreter
------------	--

Table 14, Editing data during Visualization

11.4.2 Editing data during Simulation

Assigntype	Editability
AI	If no stimulation equation is present
AO	If the force mode is activated
DI	If no stimulation equation is present
DO	If the force mode is activated
TI	No
CNT	No
SYS	No
PAR	If (Editing mode in VisElem != "without")
OUT	No
IN	Yes
IO	Yes
FLAG	If (Editing mode in VisElem != "without") (generally only possible if communication Flag)
STAT	No
PROC	If (Editing mode in VisElem != "without")
LOCAL	(if Editing mode in VisElem != "without")
KEY	Yes, is transferred as key operating to the surface interpreter of the simulated target

Table 15, Editing data during Simulation

11.4.3 Initial state of data items

	Simulation			Visualization	
	Reset (it starts with reset default values)	Restart (it starts as just switched On again)	Continue (it continues simulating as never been switched Off)	(Offline)	(Online)
FLAG	Standard value	Standard value	Previous value	No value	Current
PROC	Standard value	Previous value	Previous value	No value	Current
PARAM SYSPAR	Standard value	Previous value	Previous value	No value	Current
AI, DI	0	Previous value	Previous value	No value	Current
AO, DO	0	0	According to Process	No value	Current
TI, CNT (remanent)	0	Previous value	Previous value	No value	Current
TI, CNT (not remanent)	0	0	Previous value	No value	Current
LOCAL EVA	0	0	Previous value	No value	Current

Table 16, Initial state of data items

11.5 Database

radCASE uses the open database system NetCDF to memorize the registrations.

Further informations are available on:

<http://www.unidata.ucar.edu/software/netcdf/>

<http://en.wikipedia.org/wiki/NetCDF>

The saving is executed parallel in three different databases, which are managed by a record-file (*.rdf (radCASE data file) or any other customized extension).

<name>.rdf	management record-file
<name>_m.nc	database for measured data
<name>_p.nc	database for parameter
<name>_e.nc	database for event data

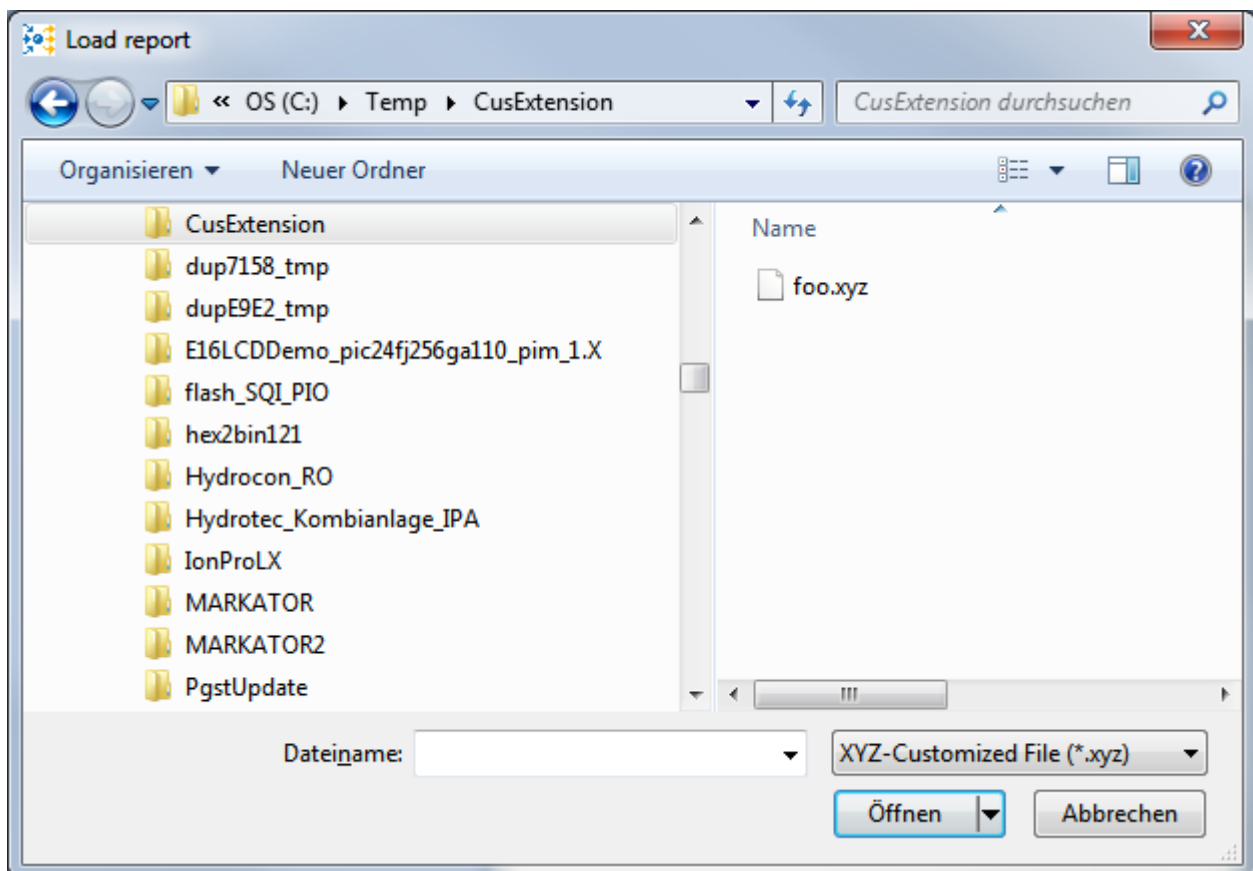
11.5.1 Customize record-file extension

It is possible to customize the standard extension of the record-file (*.rdf) via config.ini file. Referring to the sim.bat/vis.bat this file can be found at the folder ".\win\config.ini" (if a standalone is used) or at the develop folder. If not already exist, the section [RecordingFile] must be added. The next step is to add the customized extension, which will replace the standard *.rdf extension. At last the description of that customized extension can be added to. Example for adding a xyz extension:

```
[RecordingFile]
fileExtension=xyz
70ilename=XYZ-Customized File
```

- fileExtension: this will add your new extension, for example "xyz"
- 70ilename: this will describe your customized extension, for example "XYZ-Customized File"

Using the Open functionality of File Menu (refer to [4.2.1](#)) will result into the following customized open dialog:



11.6 Window settings of the application

In the develop directory there are the two following files for the window position saving:

Windowstates.ascii

Saves the MDI window positions internal to the application.
If this file is deleted the application is only started with the MDI window “mainview”. This is present in the default position.

Windowstates.txt

Saves the window dimension and the position of the main window in the complete application.
If this file is deleted the application is started with the default dimension of the application main window.

11.7 Configuration of Ribbonbar

The ribbon bar is configured with a XML-file. This file is located in “<projectdir>\Develop\ProductFrameConf\ProductFrameConf.xml”. All images required for the creation are located in “<projectdir>\Develop\ProductFrameConf\Res”.

To create a custom configuration a custom configuration should be created in directory “<projectdir>\Develop\Custom\ProductFrameConf\ProductFrameConf.xml” with all required images in “<projectdir>\Develop\Custom\ProductFrameConf\Res”.

The format of the ProductFrameConf.xml is as follows:

```
<?xml version="1.0" encoding="utf-8"?>
<Configuration>
...
</Configuration>
```

11.7.1 XML-Nodes

11.7.1.1 Configuration (required)

This node is required and the configuration will not work without it. It is the root node of the configuration. The node is only allowed one time in the configuration.

Attributes: none

Childnodes: [Languages \(required\)](#), [Mainmenu](#), [Categories \(required\)](#), [Timing](#)

11.7.1.2 Languages (required)

Definition of supported languages by configuration, should contain all languages supported by Product Framework. The node is only allowed one time in the configuration.

Attributes: none

Childnodes: [Ln \(required\)](#)

11.7.1.3 Ln (required)

Definition of one supported language in Configuration.

Attributes: none

Childnodes: none

Text: Abbreviation of one supported language (e.g. UK, GR, ...)

11.7.1.4 Mainmenu

Definition of main menu.

Note: It is not possible to define bitmapSmall and bitmapLarge for a main menu, so all icon indizes will refer to a resource within the product framework with the following icons:

Small: 

Large: 

The node is only allowed one time in the configuration.

Attributes: [name](#), [main_button](#)

Childnodes: [Category](#), [tooltip](#), [keytip](#) (only attribute [popupmenu](#)), [item](#), [Exitbutton](#)

11.7.1.5 Exitbutton

Definition of button at the end of main menu. The node is only allowed one time in the configuration.

Attributes: [name](#), [uid](#), [smallID](#), [bigID](#), [level](#)

Childnodes: [Panel](#), [tooltip](#), [keytip](#)

11.7.1.6 Categories (required)

Definition of Categories in ribbon bar. The node is only allowed one time in the configuration.

Attributes: none

Childnodes: [Category](#)

11.7.1.7 Category

Definition of one category in the ribbon bar.

Attributes: [name](#), [bitmapSmall](#), [bitmapLarge](#)

Childnodes: [name](#), [keytip](#) (only attribute [ribelem](#)), [Panel](#)

11.7.1.8 Panel

Definition of one panel in a [Category](#).

Attributes: [name](#)

Childnodes: [name](#), [Element](#)

11.7.1.9 Element

Definition of an element in a [Panel](#) of a ribbon bar, that will trigger an action when clicked on it.

Attributes: [type](#), [name](#), [uid](#), [smallID](#), [bigID](#), [level](#), [width](#) (only type="Combobox"), [Plugin](#) (only type="Button"), [Action](#) (only if Plugin)

Childnodes: [name](#), [tooltip](#), [keytip](#), [item](#) (only for type="Menu" or type="Combobox")

11.7.1.10 name

Containing the name of the parent node. Normally this name is shown in the ribbon bar for the element. The node is only allowed one time in parent node.

May contain a static text that is used for all languages. Alternatively for each language defined in [Languages \(required\)](#) a child node may be created. The child nodes tag name is the text specified in [Ln \(required\)](#).

11.7.1.11 tooltip

Containing the tooltip that is displayed when hovering the mouse over the parent node. The node is only allowed one time in parent node.

May contain a static text that is used for all languages. Alternatively for each language defined in [Languages \(required\)](#) a child node may be created. The child nodes tag name is the text specified in [Ln \(required\)](#).

11.7.1.12 keytip

The keytip to access the parent node. The node is only allowed one time in parent node.

Keytips will be displayed when pressing the Alt-key. Then the user can navigate using the shortcuts defined by the keytip.

Note: keytips only work for [Elements/items](#), if the [Category/Mainmenu/Element/item](#) above also has a keytip defined.

Attributes: [ribelem](#), [popupmenu](#)

Childnodes: none

11.7.1.13 item

Definition of an item within a Combobox or Menu.

Combobox:

Defines the value of the Combobox

Attributes: [name](#)

Childnodes: [name](#)

Menu:

Defines the action taken by a menu entry. Nested menus can be created by nesting items

Attributes: [name](#), [uid](#), [smallID](#), [bigID](#), [level](#)

Childnodes: [name](#), [tooltip](#), [keytip](#), [item](#)

11.7.1.14 Timing

Defines plugin functionality for timing based enabling/disabling of Sim/Vis. The node is only allowed one time in the configuration.

Attributes: [Plugin](#)

Childnodes: [init](#)

11.7.1.15 init

Defines the plugin functions for initializing timing based enabling/disabling of Sim/Vis. The node is only allowed one time in the configuration.

Attributes: [isSimEnable](#), [isVisEnable](#), [SIMTime](#), [VISTime](#)

Childnodes: none

11.7.2 XML-Attributes

All values of attributes have to be in quotation marks: <attribute>=<value>

11.7.2.1 main_button

Name of bitmap containing icon for button of main menu. Bitmap should be located in res-directory and should have 16x16 pixel.

11.7.2.2 bitmapSmall

Name of bitmap containing small icons for an element. Bitmap should be located in res-directory and have multiple icons within, with each 16x16 pixel

11.7.2.3 bitmapLarge

Name of bitmap containing large icons for an element. Bitmap should be located in res-directory and have multiple icons within, with each 32x32 pixel

11.7.2.4 type

The type of an element.

Possible values are: "Button", "CheckBox", "Menu", "Combobox"

11.7.2.5 name

Contains the name of a node to be used for all languages. This name usually is shown in the ribbon bar. Can be overridden by XML-Tag [name](#)

11.7.2.6 uid

Unique ID of functions that will be called as action when clicking on an element. See list of [Supported uids](#)

11.7.2.7 smallID

Index of icon within bitmap defined by attribute [bitmapSmall](#) in [Category](#) or within resource of [Mainmenu](#)

11.7.2.8 bigID

Index of icon within bitmap defined by attribute [bitmapLarge](#) in [Category](#) or within resource of [Mainmenu](#)

11.7.2.9 visible

Sets if a view will be opened at startup or not. This only defines the behavior if the application was not started before. If the application was started before this value will be ignored and the application will display all views that were opened the last time

Possible values: 0 – View will not be displayed
 1 – View will be shown

11.7.2.10 level

Minimum password level required to see an item.

11.7.2.11 ribelem

Keyboard shortcut for executing functionality.

11.7.2.12 popupmenu

Keyboard shortcut for opening popup menu/submenu

11.7.2.13 width

Width of the combo box

11.7.2.14 Plugin

DLL name containing plugin-functionalities

11.7.2.15 Action

Function name within DLL of [Plugin](#) that will be called instead of [uid](#). Function has to be of prototype: STDAPI function(void);

11.7.2.16 isSimEnable

Function name of function within DLL [Plugin](#) that returns if Simulation mode is enabled. The function will be called only once at startup of Product framework and has to be of prototype: int function(void)

The return value is:

- 0 – Simulation disabled
- 1 – Simulation enabled
- 2 – Simulation with time limit

11.7.2.17 isVisEnable

Function name of function within DLL [Plugin](#) that returns if Visualization mode is enabled. The function will be called only once at startup of Product framework and has to be of prototype: int function(void)

The return value is:

- 0 – Visualization disabled
- 1 – Visualization enabled
- 2 – Visualization with time limit

11.7.2.18 SIMTime

Function name of function within DLL [Plugin](#) that returns the time limit of simulation. The function will be called only once at startup of Product framework and has to be of prototype:

Int function(void)

The return value is the seconds that the simulation may be active (-1 for unlimited)

11.7.2.19 VISTime

Function name of function within DLL [Plugin](#) that returns the time limit of visualization. The function will be called only once at startup of Product framework and has to be of prototype:

Int function(void)

The return value is the seconds that the visualization may be active (-1 for unlimited)

11.7.3 Supported uids

Uids only usable in simulation:

uid	Functionality
32853	Change to visualization mode
108	Set simulated RTC
5800	Simulation speed
32806	Enable/disable single step mode
32807	Execute single step
310	Run/Stop single steps
32847	Open Sequence
32864	Process Sequence
259	Close Sequence

Uids only usable in visualization:

uid	Functionality
32848	Change to simulation mode
651	Select Communication Interface
32794	Configure Communication Interface
32816	Get protocol from device
32775	Open modem connection
418	Activate/deactivate Reduced communication
646	Open file transfer dialog (see also 4.16)
652	Open transfer recording dialog (see also Transfer recording)

Uids usable in both modes:

uid	Functionality
57600	Creating a new recording
57601	Opening an existing recording
57603	Saving recording
57604	Saving recording as

57607	Print SURFACE_PRINT of current SURFACE_VIS
57609	Preview SURFACE_PRINT of current SURFACE_VIS
32771	Close current recording
57665	Exit product framework
32810	ASCII-Export
32858	Sequence-Export
32860	Change language of product framework
32801	Enter password for authorization Note: this UID can be saved by itself by password but could never be reached again to reset this password
32802	Reset authorization
32803	Change passwords for authorization
32836	Zoom out
32835	Zoom in
59393	View hide status bar
150	View Property view
134	View Module Tree view
149	View Output
650	Freeze Output
32804	View record panel
32821	Enable/Disable force mode
1004	Turn to receive mode
1066	Turn to playback mode
1065	Turn to burst mode
32845	Open Recording settings
32846	Open event notifier
186	Open store rate
647	Enable/disable the “automatic update of parameters” feature (see also 4.7.1)
32812	Get parameters from device
32813	Send parameters to device
32814	Load parameters from file
32815	Save parameters to file
32822	Save parameters to ASCII file
417	Save parameters to binary file
369	Menu for handling windows. Order or content can't be changed using items only the names of the items can be changed. The sub-items are “Cascade”, “Tile horizontal”, “Tile vertical” and after that a list of currently opened windows that can't be modified. This UID can be saved by password and only be hidden completely (and not greyed out).

11.8 Reduced communication

The data communicated between the target and the PC visualization can be reduced, e.g. for establishing a GSM modem communication.

The following reducing can be done by setting the according value into the [Communication] section of the `config.ini` file, placed in the Develop directory (or at `.\win\config.ini` if using standalone):

- Disable communication of display data with **setting** `ComDisplay=0`
- Disable communication of different IOs with **setting** `IOEnable=0x<mask>`. 0 means, that all IOs are disabled, the following Bits enable the following IOs: 0 means, that all IOs are disa-

bled, the following Bits enable the following IOs:

0x01: DOs enabled

0x02: DIIs enabled

0x04: AOs enabled

0x08: AIs enabled

0x10: CNTs enabled

0x20: TIMs enabled

- Disable communication of different Flags. To do this, the Flags have to be assigned to different Communication types V1 – V9 in the design. After this it is selectable which of these Flags will be communicated with **setting** `VEnable=0x<mask>`. 0 means that no Flags are communicated. By setting the different Bits the different V-Types are communicated:

0x01: V1 is communicated

0x02: V2 is communicated

0x04: V3 is communicated

...

0x100: V9 is communicated

Remember: Only values between 0x00 and 0x1FF are allowed.

Examples of entries in `config.ini` with maximum reduce of communication:

```
[Communication]
ComDisplay=0
IOEnable=0
VEnable=0
```

For an established connection the communication can be switched between the reduced mode and the normal mode. In normal mode all Flags with V1 – V9, all IOs and the display data is communicated (for displays up to 128x64 Pixel). In reduced mode only the items that should be communicated according to previous setting, in the `config.ini` file, are communicated. To switch between reduced and normal mode a Checkbox or Button with UID 418 has to be added to the product framework (see also [11.7 Configuration of Ribbonbar](#)). The activated setting means reduced communication.

Example of an XML-Node to do this:

```
<Panel name="ComLevel">
  <UK>Comm. reduced data</UK>
  <GR>Komm. reduzierte Daten</GR>
  <Element type="CheckBox" name="ComLevel" uid="418" smallId="-1" bigId="3">
    <name>
      <UK>reduced data</UK>
      <GR>reduzierte Daten</GR>
      <FR>moins dates</FR>
      <IT>reduced data set</IT>
    </name>
  </Element>
</Panel>
```

This could e.g. be added below the following XML-Node:


```
<Panel name="VIS">
  <Element type="Button" name="VIS" uid="32853" smallId="0" bigId="0"/>
</Panel>
```

Please remember to make the changes of the example in the ProductFrameConf.xml file of the CUSTOM-Directory.

11.9 Including a file for online help

After the first execution of the Simulation or Visualization (by using respectively the sim.bat or vis.bat batch files) the file `config.ini` is created in the subdirectory `\win`. To provide the help function in the standalone version, the file `config.ini` has to be edited.

Just insert the following line below the marker `[GENERAL]`:

```
HELPPFILE=MyHelpFile.pdf
```

Such line makes the Simulation/Visualization open the desired help file (e.g. in this case `MyHelpFile.pdf`) by clicking on the item `Help` in the `?` entry of the menu. The document `MyHelpFile.pdf` has to be located in same directory with the file `radMON.exe`.

If the help file is located in a subdirectory (e.g. `help`) of the standalone version, just add the relative path (starting from the directory where the `radMON.exe` is located).

Example:

```
HELPPFILE=help\MyHelpFile.pdf
```



The Help Topics entry of menu will be grayed out as long as no `HELPPFILE`-option is defined in the `config.ini` file.