radCASE
model-based tools

Change Log

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Table of Contents

1   Guideline to this document

This document contains a brief description of all changes made to radCASE. Changes to existing features and new features are also described in detail in the radCASE-documentation. This document servers as a quick overview of the changes between different release versions and develop subversions.

The change log of every version is divided into separate chapters:

Code generation + runtime library:......... Contains changes to all code used for target generation except API. So this affects changes in the code generator and in the source code parts of the rc_lib (rc_lib\ctr_lib\Source and according headers)

Product Framework:.............................. Contains changes to visualization and also the API code parts of the simulation

Documentation generation: .... Contains changes to documentation generation

radEDIT: .... Contains changes to the Editor

rad-Library: .... Contains changes to the .rad-Library (rc_lib/LIB)

API-Interface:....................................... Contains changes made to the API-Interface. This are normally changes also listed under Code generation + runtime library. This is only meant as overview on what needs to be changed in the API.

Custom Sim .... Contains changes made to the simulation project, which need adaptions for custom simulation project files

Known severe bugs .... Contains severe bugs contained in a version and possible workarounds or solutions.

For the changes the following symbols and color codes are used:

☼   New Feature
ⓘ   Enhancement
✓   Bugfix
✗   Bug

In addition to this. changes that may require modifications in an existing design/project when converting are marked with the following symbol: ✗
E.g.:

☼✗   Function x has new additional parameter y to support new feature z

1.1 Expansion Guideline for Developers (internal)

Developers who want to add new entries to this document, please consider the guidelines as described in radCASE_SVN/trunk/_intern/Entwicklung/Dokumentation/ in the document radCASE_Development_Central.docx in chapter "Changelog Rules"

1.1 Expansion Guideline for Developers (internal)

2   General Information

2.1   Frequently asked questions

2.1.1.1   Microsoft Visual Studio / Visual C++ Express (VS) and Simulation Project

Q: Do I have a default or a custom simulation project?

A:

radCASE >= 4.9.0r:

> If the directory <Project>\sim contains a subdirectory "CustomProj", you have a custom simulation project, otherwise you have a default simulation project.

radCASE < 4.9.0r

> If you made modifications inside the directory <Project>\sim, you have a custom simulation project, otherwise you have a default simulation project.

Q: My project uses Visual Studio 2008. How do I convert the project to Visual Studio 2010?

A:

radCASE >= 4.9.0r:

> The latest installed VS-Version supported by that radCASE version will automatically be chosen in case of a default simulation project. In case of a custom simulation project:

radCASE < 4.9.0r

> First check, if the radCASE-Version used in the project supports Visual Studio 2010. If you have a hardware-locked license, contact IMACS support, please.

> Note: If you have a custom simulation project (see above), these changes will be lost and have to be done again.

> To convert the project to use Visual Studio 2010 simply copy all files from &OSDL_SYS%\Soft\Sim2010 into the Sim-directory of your project. Also make sure the environment variable MSVC_BIN is set to the …\VC\bin directory of the Visual Studio 2010 installation.

> Note: When a new project is created, it is set up for Visual Studio 2008 by default. You can convert it as described above.

2.2   Compatibility matrices

The tables in this chapter list the compatibility of the different radCASE versions with other software, hardware, licensing mechanisms etc.

The following different statuses are available:

Status	Meaning
Supported	It will work
Not recommended	It will work, but it is not recommended
Deprecated / Untested	It will probably work, but there is no guarantee and if it does not work there will be no support, so it is strongly advised to not use it

Not supported	It will not work

2.2.1 Operating systems

The operating system compatibility table also applies to the standalone version created by the according radCASE version.

radCASE Version	Windows XP	Windows Vista	Windows 7	Windows 8/8.1	Windows 10
< 4.5	Supported	Untested	Untested	Untested	Untested
>= 4.5	Supported	Supported	Supported	Untested	Untested
>= 4.9	Supported	Supported	Supported	Supported *1)*	Untested
>= 4.11	Deprecated	Not recommended	Supported	Supported	Supported
=> 4.13	Not supported	Deprecated	Supported	Supported	Supported

Notes
1) The installer of radCASE may show an error message that the operating system is not supported, which can be ignored.

2.2.2 .NET Framework

radCASE and the generated Standalone will need the .NET Framework to be able to run. The following table lists which .NET Framework version is needed by which radCASE version:

radCASE Version	.NET Framework version
< 4.13	3.5 SP1
>= 4.13	>= 4.0

2.2.3 Microsoft Visual Studio / Visual C++ Express Versions (VS)

The following table lists which versions of VS are supported by which radCASE-Version. Visual Studio is used for creating a simulation of the controller software. Also from radCASE 4.9.0r onward a HAL implementation is delivered with radCASE which can be used to create a target software for the PC. This can be used e.g. for creating a remote master for emBRICK projects.

⚠️ Make sure to **observe the instructions** given in chapter *Installation of Microsoft Visual Studio/C++ [Express]* in the *Installation Manual*.

Visual Studio Version	radCASE Version	
Visual Studio 2005	Supported *5)*:	< 4.7.0r
	Not recommended *5)*:	>= 4.7.0r && < 4.9.0r

		Deprecated _4) 5)_:	>= 4.9.0r && < 5.0.0.r
		Not supported:	>= 5.0.0r
Visual Studio 2008 or Visual C++ 2008 Express		Not supported:	< 4.3.115
		Supported _5)_:	>= 4.3.115 && < 4.10.0.r
		Deprecated _4) 5)_:	>= 4.10.0r && < 5.0.0.r
		Not supported:	>= 5.0.0r
Visual Studio 2010 or Visual C++ 2010 Express		Not supported:	< 4.7.0r
		Supported _3) 5)_:	>= 4.7.0r && < 4.9.0r
		Supported:	>= 4.9.0r
Visual Studio 2012 or Visual Studio 2012 Express for Desktop		Not supported:	< 4.9.0r
		Supported _5)_:	>= 4.9.0r < 5.0.0r
		Supported:	>= 5.0.0r
Visual Studio 2013 or Visual Studio 2013 Express for Desktop		Not supported:	< 4.10.0r
		Supported _5)_:	>= 4.10.0r < 5.0.0r
		Supported:	>= 5.0.0r
Visual Studio 2015 or Visual Studio 2015 Express for Desktop		Not supported:	< 4.11.0r
		Supported _5)_:	>= 4.11.0r < 5.0.0r
		Supported:	>= 5.0.0r
Visual Studio 2017 or Visual Studio 2017 Express for Desktop		Not supported:	< 5.0.0r
		Supported:	>= 5.0.0r

Important:

Apply all service packs and updates for your version of Visual Studio.

Notes

2) As of radCASE 4.9.0r, the environment variable MSVC_BIN is not needed any longer and can be deleted.

3) The Test/Trial- and HWL-version of radCASE only support VS 2008. In the HWO-Version, the MSVC_BIN must be set manually and the project has to be converted to VS2010 manually – see _Microsoft Visual Studio / Visual C++ Express (VS) and Simulation Project_.

4) Deprecated versions will probably work, but are not supported or tested anymore.

5) The Visual Studio version is only supported for simulation, but not for creating a target software for PC.

2.2.4 Dongle Types

The following table lists which dongles are supported by which radCASE-Version:

radCASE Version	SuperPro (Rainbow / SafeNet Sentinel)	HASP (SafeNet)
< 4.7.0r	Supported	Not supported
>= 4.7.0r	Supported	Supported

2.2.5 License files

The following table lists which license files (*.lic) can be used with which radCASE-Version:

radCASE Version	Visual.lic	Radon.lic (V1)	radCASE.lic (V2)
< 4.8.0r	Needed	Supported	Not supported
>= 4.8.0r	Not needed anymore	Supported	Supported

2.2.6   Common & rc_lib

Common & rc_lib are a „unit". Different versions must not be mixed. There is a check and if they do not match each other, an error message like is shown and the design compilation is aborted.
The check is implemented in the Common as of radCASE version 4.3.113w.

3   Release Version 5.2.0

3.1   Code generation + runtime library

- ✓ Fixed generation of element pointer lists @HS
- ⓘ Adjustable timeout settings for Imas-Protocol @HS
- ⓘ✗ WEB remote HMI now asks for the Password, if PassVisu is set to another value than "00000000". Requires the file „passwd.html". The function fnSendFileCallback() in httpsrv.h has been changed and it must be modified if an individual version of this function exists. @NV
- ⓘ✗ EBins now support more than 127 selections (up to 32767). For this a new C-datatype XBIN is introduced which will be char/short depending on the number of selections of the biggest EBIN. The protoptype of the following C-functions changed:

    CEBin_getSelStr() 2nd parameter actIndex is now of type XBIN
    CEBin_getSelDesc() 2nd parameter ind is now of type XBIN
    c_edit_sel() 3rd parameter actnum is now of type XBIN*
- ⓘ Changed display of error code in RdSystemError to Hex @HS
- ✓ Fixed structure padding problem with receiving of parameters @HS
- ☼ New assign types NATIVEvar and NATIVEconst implemented @HS
- ✓ Fixed error localization for double surfaces labels within inheritance @HS

3.2   Product framework

- ✓ Fixed some GDI leaks @HS
- ✓ Fixed drawing of circles (error introduced by fixing GDI leaks) (#2721) @HS
- ✓ More robust error handling on timeouts of received packets from the controller (@HS)
- ✓ Fixed drawing of PNGs with transparency @HS
- ⓘ Optics of line ends improved @HS
- ☼ Added average status data transfer time and average answer time to status bar (#2336) @HS
- ⓘ Set display of not communicated elements to "???" @HS
- ✓ Corrected setting of values for display to not communicated for strings and multiselective EBins @HS
- ✓ Fixed error in parameter saving of PROCs @HS
- ✓ Fixed error in authorization of module tree view, when permission levels are not set in design (#2723) @HS
- ☼ Added buttons for restart of simulation without restarting product framework. All start modes are supported (#1660) @HS
- ☼ New assign types NATIVEvar and NATIVEconst implemented @HS
- ☼ Added support for configuring connection timeouts (has to be supported by communication DLL and may require adjusting timeouts on the target controller) (#2708) @HS
- ☼ Added more information on connection status (#2708) @HS

3.3   Documentation generation

- ⓘ Filenames for pictures of Surface_Ctr now use the html number from a DtEntry instead of a random number @HS
- ✓ Fixed buffer overflow for deep nesting of modules (#2722) @HS
- ⓘ Picture size for Surface_Vis doubles @HS

- ✓ Fixed Artefact counter handling in case of inheritance @HS
- ⓘ Removed added border at right and bottom in picture export of Surface_Vis @HS
- ✓ Fixed drawing of PNGs with transparency @HS
- ⓘ Optics of line ends improved @HS
- ✓ Fixed crash for Language EV=0 @HS
- ☼ New assign types NATIVEvar and NATIVEconst implemented @HS

3.4　Editor

3.5　Rad-Library

- ⓘ Recording allows no usage of user program defined filepath / -name for recording file@WD

3.6　API-Interface

3.7　Custom Sim

4 Release Version 5.1.0

4.1 Code generation + runtime library

✓ Fixed RGB mismatch in TTF output@WD

☼✗ cnt_force() value is now long, not short @WD

☼✗ The files rdsocket.c and rdsocket.h are now part of the HAL/API and not longer part of the runtime library. This may require adaption of project specific .bat- and makefiles. @WD

☼ Added password support in communication with visualization @HS

ⓘ Socket interface uses internal function for hostname instead of socket function @HS

✓ Fixed usage of float/double in data preservation (no data type changes allowed) (#2693) @HS

☼ Added Comtype L (List) for creating element tables @HS

☼ Added new function pointer `RDfp_onEverySurInterpreterCycle` that is initialized to `NULL`. This function will be called after every cycle of SurfaceInterpreter (at the end) if it's pointer has a value other than NULL. @BS

✓ Fixed recognition between usage of extended rectangles on Surface_CTR and Surface_VIS @HS

ⓘ Comtype L will also generate an RDI @HS

ⓘ Names of elements are also exported when using XCOM-type @HS

☼ New function pointer to customize no-authorization-message: `STD_CUS_FUNC RDfp_NoAuthorization` (#2654) @BS

✓ Fixed cursor size of arrow cursor in menus @HS

ⓘ Support for quotation mark in texts added (#2705) @HS

✓✗ Fixed export of global colors: RDRGBCOL, RDRGBCOLBK and RDRGBCOLTRANS are now exported in RGB instead of BGR. If using those defines and colors where red and blue value are different, the usage has to be adapted to the correct behavior. @HS

ⓘ Seperated size and type of RD_IDX_PNT_TAB-structure to allow for string length > 15. Also CTR-Setting PE=<0/1> was removed in the process @HS

✓✗ Fixed possible buffer overflow in number to string conversion. Removed function CENum_checkFormat(). @HS

ⓘ System time (*FSysTime) now also generates correct value of centiseconds. Since RTC does not deliver centiseconds, the value is generated internally. This mechanism requires approx. 2 seconds to synchronize after power up or setting of the RTC @WD

✓ Fixed error in conditional surfaces on touch handling if an action opens another surface @HS

☼ Added new timer `timLastTouchKey` that counts seconds since last detection of touch or key activity. This timer is set to 0 if any touch or key has detected. @BS

✓ For RD_UNICODESETTING = 2, ASCII-chars >127 are now correctly converted into 2byte-values @WD

☼ 2 new functions have been added : double ENum2Double(CENum * pElem) and void Double2Enum(double value, CENum * pElem). These functions are usefull when using math-library functions with radCASE ENum elements as parameters. The ENum elements must not have the forced data type float or double. @WD

✓ Fixed crash of radGEN when using empty PUT. @HS

ⓘ Added error message on crash of radGEN. @HS

☼ a new function has been added : void Long2Enum(long value, CENum * pElem). This function is needed by the current JSON parser implementation. The ENum element must not have the forced data type float or double. @WD

- ⓘ Due to better compatibility the macros `min(a,b)` and `max(a,b)` has been replaced by `RD_MIN(a,b)` and `RD_MAX(a, b)`. The old macros has been declared as deprecated (see `ctr_him.h`) @BS
- ☼ Par and Sys data supported for ComType Px (@HS)
- ⓘ ColTabConverter.exe supports a wider range of bitmap formats @HS
- ✓ Fixed edit mode permanent for element visualizers directly in Surface_CTR @HS
- ✓ Fixed execution of actions in ActionConditions in Fulls, if they trigger surface actions @HS
- ☼ Introduced new flag `RD_fHmiDisabled` to disable writing on real HMI or display but still be able writing on virtual HMI such like VISU or WEB-HMI @BS
- ✓ Fixed an error in dollar-notation replacement, where the dollar notation wasn't replaced in special cases. @HS
- ✓ Fixed relative positioning of pressed/released pictures of AIcons after a Full. @HS
- ☼ New standard execution types INITpre and INITpost @HS
- ✓ Fixed double export of functions and errornous calls of those functions in special cases of inheritance @HS
- ⓘ✖ Because of moving color tables into the Makefile of the API, the color table must now be generated differently. Instead of only generating the color table, into the generated coltab.c an include of the include_all.h and an extern forward declaration of the generated color table is necessary @HS
- ✓ Fixed a warning in generated code around format string EV=1 and multi byte selection masks (#2718) @HS

4.2 Product framework

- ☼ Added password support in communication with target @HS
- ✓ Fixed crash in simulated pixel drawing routine, when drawing pixels out of display @HS
- ✓ Fixed error with loading of recorded data after switching mode (#2513) @HS
- ☼✖ Communication interface can be switched at runtime. The used interface at start is selected in the following order:
  1. Communication interface specified by command line (/COMDLL=<interface DLL file name>:<dll specific configuration>)
  2. Last used interface
  3. Interface selected in design (Timing-Setting CD=<infertface DLL file name>)
  4. Selection dialog
  If a communication interface should not be used under any circumstances, the plugin has to be deleted in the according plugins-directory. (#2692) @HS
- ✓ Fixed detection of mouse clicks on radio buttons in Surface_Vis @HS
- ⓘ Improved standard timeout values for Ethernet communication @HS
- ✓ Fixed communication interface specified by command line. Did not work as last parameter when without quotation marks. @HS
- ⓘ Password dialog will not be shown again after Cancel, until connection drops @HS
- ☼ Added error logging for communication between radMON and controller. Error log is shown in Output window and Output_ComError.txt. @HS
- ⓘ Communication DLLs can be translated by adding translation files @HS
- ⓘ Cursors now supported for proportional fonts (if the correct width and height are in the _sysFontWidth and _sysFontHeight. c_cur_clear() fixed @HS
- ☼ New standalone selection tool replacing old version dynamic switching @HS
- ⓘ Support for quotation mark in texts added (#2705) @HS
- ☼✖ Fixed extended rectangles with global fore-/background color in simulated display @HS

- ⓘ During handshake checksum acknowledges are ignored, so protocol version detection works correctly for targets with older radCASE versions @HS
- ⓘ Changed file structure for easier change of used runtime system files @HS
- ✓ Fixed crash in file transfer (#2715) @HS
- ☼ Added support of line end styles in Surface_Vis @HS
- ✓ Fixed deadlock with output window @HS
- ✓ Fixed bug in error messages in communicaton. Does not throw cmd2 errors anymore when disconnected @HS
- ☼ Added transfer of recordings made with recording.rad @HS
- ⓘ Support for a wider range of bitmap formats of color table @HS
- ✓ Fixed crash on using PC_RECDATE and PC_RECTIME @HS
- ✓ Fixed positioning of text visualizers for various alignments and rotations @HS
- ✓ Fixed graphical errors on histogram visualizer buttons after scrolling in surface @HS
- ✓ UART_read is now nonblocking @HS
- ✓ Fixed loading of parameters for loading parameter files where parameter structures differ @HS

4.3 Documentation generation

- ⓘ Added filling feature to artefact counters @HS
- ✓ Fixed crash in case of fonts drawing out of display @HS
- ⓘ Assign strings are only included in developer documentation @HS
- ☼ Added artefact comparison placeholder @HS
- ✓ Fixed positioning of rectangles for embedded HMI screens @HS
- ✓ Fixed HMI in FULLs in Surface_VIS @HS
- ⓘ Enhanced inverting cursor for proportional fonts with antialiasing (#2319) @HS
- ⓘ Support for quotation mark in texts added (#2705) @HS
- ☼ Added support of line end styles in Surface_Vis @HS
- ⓘ Support for a wider range of bitmap formats of color table @HS
- ✓ Fixed positioning of text visualizers for various alignments and rotations @HS
- ✓ Fixed multiline descriptions in Surface_VIS @HS

4.4 Editor

4.5 Rad-Library

- ☼✗ in Protocol7.rad, the Module MProtocolSdcCsv has been split into a non-reentrant main module and a reentrant base module to allow derived module types for special logging requirements. This requires more allocable memory, therefore in certain applications the amount of allocatable memory must be increased @WD

- ⓘ✗ The Diagnosis and Calibration menus for surfaces >= QVGA have been redesigned to fix a number of bugs and inconsistencies. Since some Elements have been removed and functions have been removed or renamed, Modules derived directly or indirectly from MDialogsLarge may need a redesign. In the standard modules (e.g. MDialog640x480) the following SURFACEs_CTR have been modified : 502,514,525, 14602, 14603, 14605, 14404, 14406. The SURFACEs 14409 and 14411 have been removed. @WD

✓ SD-Card import now considers unit conversion @WD

ⓘ Due to better compatibility the macros `min(a,b)` and `max(a,b)` has been replaced by `RD_MIN(a,b)` and `RD_MAX(a, b)`. The old macros has been declared as deprecated (see `ctr_him.h`) @BS

4.6 API-Interface

ⓘ✖ coltab.c has to be compiled by Makefile instead of including it, if needed @HS

4.7 Custom Sim

☼ Support for adding additional files, include directories and linking additional libraries to existing projects. This works by adding the files projectSpecifcFiles.txt, projectSpecificIncludeDirectories.txt and/or projectSpecificLibraries.txt to the CustomProj directory instead of new project files.

5   Release Version 5.0.0

5.1   Code generation + runtime library

- ✓ changed format for kaliEditPhys() in diag.c from 0x0140 to 0x0150, because meanwhile the AO for the emBrick uses a range of 0..12900 or 0..16000 for the physical value. The change will only affect projects not using RD_MODALDIALOG, means using the tvis_dialogs.rad or tvis_dialogs_128x64.rad, because herein it was changed correctly earlier. @AL
- ⓘ When exporting Arabic characters, the arabic presentation form is exported into CharsOver-Limit.bin, too. (#2557) @HS
- ✓ Fixed size contraining of RD_getstr (#2583) @HS
- ✓ Fixed possible endless loop in function ArrayMirror (#2584) @HS
- ✓ Fixed detection of string size for Unicode-Setting UC=1 @HS
- ✓✖ Replaced MAX_SMALLFONT_CHAR with design compiler generated FONTCHARACTER-LIMIT. The rc_lib does now correctly regard Ctr-Setting FCL (#2407) @HS
- ⓘ Define RD_NO_BLINK is generated automatically, if RD_NO_COLOR is set (#2373) @HS
- ✓ added screen macros for NO_EMB_HMI = 1; ___CTR___ undefined and modified SIM directory to use these macros @WD
- ⓘ Export pointers to act-Values for targets without HMI, when element structures are enforced @HS
- ☼ Long texts support added – see Reference Manual, chapter Text Support, Long Texts and Text Access (#2060, #2063) @MG, HS
- ✓ Fixed error handling in communication protocol @HS
- ⓘ Implemented new IO-Interface in rc_lib, for less manual HAL programming effort
- ☼ Added code for emBRICK-Remote-Master @HS
- ✓ Fixed force mode for Counters (#2602) @HS
- ⓘ✖ Reordered headers, to speed up simulation and target generation after design compilation. When using code from the design in external C-files the according headers have to be included manually or the functions need a forward declaration. This also applies to processing type functions executeXXX. (#2484) @HS
- ☼ Design compiler will only generate files, if contents change. This will allow for faster simulation and target generation. (#2484) @HS
- ✓ Fixed crash in case of recursive Fulls (#2382) @HS
- ✓ Fixed error in error localization introduced with #2484 @HS
- ✓ Fixed crash for combination of submodules and inheritance to make a recursion in the module structure (#2512) @HS
- ✓ Touch will now also interrupt automatic abort mechanism (#2610) @HS
- ⓘ✖ Changed standard value of Desktop-Setting TE to 0 (#2273) @HS
- ⓘ FTransEnabled will be initialized with a variable, which activates the transitions by default. (#2273) @HS
- ⓘ✖ Changed standard value of Timing-Setting IR to 10 (#2603) @HS
- ☼ Long text (LTXT) support added, also qualified for UTF-8 (#2560). @MG
- ⓘ Added some sanity checks for usage of module poiners/indistinct modules (#2617) @HS
- ⓘ Removed unusable Define IO_const (#2267) @HS
- ⓘ✖ Moved project preparation to opening of project, which speeds up the design compilation step, requires current version of radEDIT. (#2326) @HS
- ⓘ Depending on used display size some constants regarding positions and sizes are preset but does not match every time. With the new define "RD_NO_POSANDSIZE_PRESET" these fixed values could be set by customer in radCASE design. If activated the following defines should be adjusted: MAX_LINES, POS_MES_Y, SIZE_MES_Y, SIZE_EDIT_Y,

MAX_COLUMNS, POS_MES_X, SIZE_MES_X, POS_ENTER_X, POS_F2_X (see ctr_cons.h for more details). @BS

✓ Fixed overriding of MAXPNTARRAYDEPTH for HWL-version @HS

✓ Added RD_DMINELEMDESC to critical defines for HWL-version (#2627) @HS

✓ Fixed touch handling for relative positions after FULLs (#2626) @HS

ⓘ Enhanced error detection for If/Endif in surfaces and sequence diagrams (#598) @HS

ⓘ✗ Removed unused second parameter unitconv from functions CENum_getAct and CE-Num_getActFlp (#885) @HS

✓ When the target in a file transfer was not supposed to send data back, some random data was sent, but was discarded by radMON. The target now correctly sends no data anymore. @HS

✓ Fixed crash for long paths in entity tab (#2631) @HS

ⓘ Made file transfer more robust to API errors @HS

✓ Fixed relative positioning after FULLs if the FULL is disabled by a condition (#2623) @HS

ⓘ Enhancements for high DPI devices @HS

ⓘ✗ Fixed calculation of menu cursor position if no menu is available (cause of if-conditions). This caused an address trap on CortexM3-CPU in vis.c @BS

✓ Added missing header for protocol version 6 @HS

✓ Fixed creation of recv-function in distrib.c @HS

✓ Fixed touch execution of objects in FULLs, when FULL is disabled by a condition @HS

✓ Fixed possible crash for Unicode characters in places Ascii characters are expected (#2637) @HS

✓ Fixed display of standard value for EBINs with activated subtexts (#2638) @HS

✓ Fixed error on usage of VMNumBar1 (introduced with fix for distrib.c) @HS

✓ Fixed crash in special case of wrong CANOPEN assign string (#1177) @HS

✓ Fixed detection of Super Pro Dongle @HS

ⓘ Optimized text export @HS

✓ Fixed errorchecks for simulation equations @HS

ⓘ Better error detection for usage of Local and EVA elements on Surface_CTR (#1170) @HS

✓ Added error message and correct error code for missing modul.xml and missing system module @HS

ⓘ Optimized binary data export (osdl.ini) @HS

✓ Fixed crash for recursive submodules (#2642) @HS

ⓘ Binary optimization always active (removed Setting DOO) (#2643) @HS

✓ Added mirror elements for complete subnode export to element lists @HS

ⓘ Improved performance for design compile @HS

ⓘ Standard values of ETim and EDat are not exported as Text anymore (#1240) @HS

✓ Fixed generation of Big-Endian files after performance improvements @HS

✓ Fixed ComType A (will now only generate RDI for elements and not communication functions like ComType C. (#1110) @HS

ⓘ Standard value will be shown correctly in edit dialog for SV=$elem (#1247) @HS

✓ Fixed ComType P in EntityTab @HS

✓ Fixed some issues with big endian format @HS

✓ Fixed issues with IOs accessed through binary data @HS

ⓘ RDWrEvt-functions are now only needed for Comtype Ex and not anymore for every use of RDIs. Introduced new Define RD_USE_EVT_TRIGGERED_COM, which will be used to detect, if Comtype Ex is used in the project. (#2652) @HS

ⓘ Enhanced image export. Double export of images is prevented @HS

☼ Support additional file formats (e.g. Jpg, Gif, RLE-encoded Bitmaps) for export. The images are converted to the internal bitmap format used by HALs. @HS

- ⓘ 32-Bit images (except PNG) are automatically converted to 24-Bit images (ignoring alpha layer). @HS
- ⓘ Allow bigger data sizes (#2649) @HS
- ✓ Fixed error in data preservation, when oldsize is read out as 0 size @HS
- ☼ Messages in radCASE protocol handler can be overridden by using the function pointer pOverrideCommands. The same function pointer can be used to handle application specific messages previously handled by pHandleAppSpecCommands.
  The function pointer pOverrideCommands has the prototype char (*pOverrideCommands)(RDN_PROT_IFACE* rpi);
  A return value of 1 means the message was handled by the function and will not be handled by the standard protocol handler. A return value of 0 will trigger the standard action for the message. @HS
- ☼ Added support for flowmeter to Brickbus Remote Master @HS
- ✓ Bugfix for remanent data saving @HS
- ✓ Fixed code generation for nested Choices in Statemachine @HS
- ✓ Overridable commands in protocol handler include handshake on first connect @HS
- ✓ Fixed error with Systemtime in recordings @HS
- ✓ Fixed error reporting in Testversion (#2675) @HS
- ☼ Added new interface for socket connections (implemented for windows and Posix) @HS
- ✓ Fixed length of elements in memio.dok (#2679) @HS
- ✓ Fixed starting offset of IOs (don't waste 1 Byte anymore) (#2678) @HS
- ☼ §-Syntax supported for EDat and ETim elements in C-code (#2239) @HS
- ⓘ Added select and helper functions to socket interface @HS
- ☼ Support new mutex and threading functions @HS
- ☼ Added creation of build ID @HS
- ⓘ Design compiler catches an error in inheritance, when trying to overwrite multiplicity of arrays (#1882) @HS
- ✓ Errors originating from the EntityTab will be linked to the according EntityTab entry (#1901) @HS
- ✓ Fixed crash in PutElemDBData for invalid data (#2681) @HS
- ✓ Some error locations (e.g. Line) are fixed (#2683) @HS
- ☼ Added MetaAcces.c to generation which can be used to get a CElement-Pointer from a communication offset @HS
- ⓘ Added rdShutdown and rdGetHostname to rdSocket-Interface @HS
- ⓘ Support for LWIP in freeRTOS added to socket interface @HS
- ✓ MetaAccess.c is sorted by offsets @HS

5.2 Product framework

- ✓ Fixed multiselective values in element info (#2567) @HS
- ⓘ Enhanced error handling and marquee progress bar added (#2437) @HS
- ✓ Fixed missing redraw of histogram for changes of Y-Zoom or scrolling vertical (#2576) @HS
- ✓ Fixed wrong detection of not communicated elements (#2586) @HS
- ✓ Fixed wrong detection of not editable elements (#2589) @✓ Fixed crash on sending floating point values to target (FP=1) (#2493) @HS
- ✓ Fixed error in sending EStr values to simulation (#2590) @HS
- ✓ Fixed crash on custom dynamic switching dialog box (#2594) @HS
- ✓ Fixed sending of Date-elements (#2595) @HS
- ✓ Fixed endless loop for communication errors during debug message receiving @HS

- ✓ Fixed crash on Novalues in Statemachine-View (e.g. when starting the Simulation) (#2601) @HS
- ✓ Fixed possible endless loop in cclConnection.dll when receiving wrong data @HS
- ✓ Fixed error in energy consumption analysis in case of inheritance (#2087) @HS
- ✓ Fixed error on drawing VIS_LINE when window is already open at the start (or for NO-VALUES) @HS
- ✓ Fixed positioning of multiline texts in Surface_Vis @HS
- ☼ Added support for multiline texts as descriptions in Surface_Vis (#2119) @HS
- ✓ Fixed freezing on using long values within a histogram (#1879) @HS
- ✓ Fixed upload of files from targets without directory listing (#2614) @HS
- ⓘ File transfer supports overwriting files (#2618) @HS
- ⓘ✗ Ribbon bar migrated to Windows 7 style. The required .NET framework changed from 3.5SP1 to .NET 4.0 or higher. Windows XP is no longer supported. @HS
- ⓘ✗ The new ribbon bar style also requires the main icon to change to 16x16 pixels in case of a custom ribbon bar. @HS
- ⓘ Better detection if IP change was successful in broadcast search dialog (#2612) @HS
- ✓ Fixed starting problems of standalone after one of the last changes (#2628) @HS
- ⓘ Enhancements for high DPI devices @HS
- ✓ Fixed display of CONST elements on Surface_Vis (#2633) @HS
- ✓ Fixed alignment for burst packets (#2634) @HS
- ⓘ Saving in output window replaced with automatic logging @HS
- ⓘ Output length in output window is limited, to prevent performance issues @HS
- ⓘ Output window will now always scroll to end, when text is added. Adding of text can be stopped, to examine and copy output @HS
- ✓ Fixed error in sending date values (#2646) @HS
- ✓ Fixed element info for multiselective EBINs (#2647) @HS
- ✓ Look of state machines adapted to current version of editor (#2650) @HS
- ✓ Fixed crash for a value of 0 for number of grids in histograms (#1794) @HS
- ⓘ Allow bigger data sizes (#2649) @HS
- ✓ Fixed bug in sending of data to target introduced by last change @HS
- ✓ Fixed deadlock in automatic data saving on reaching maximum records @HS
- ✓ Fixed refresh of conditional surfaces on deactivating items (#2672) @HS
- ⓘ Automatic redraw of target display for display command communication on connect, if necessary (#2673) @HS
- ✓ Fixed errors in simulated SD-Card-Filehandling @HS
- ☼ Added new UART-Interface as empty functions to be able to link projects using this new feature on the controller @HS
- ✓ Fixed crash of simulation for designs with module pointers @HS
- ⓘ Implemented UART-Interface for simulation (#2684) @HS
- ☼ Support of Visual Studio 2017 for simulation creation (#2587) @HS
- ⓘ Changed UART-Interface for simulation. The index passed to the functions will now be the used COM-Port, instead of using a dialog for selection of mapping. @HS
- ✓ Fixed error in serial connection DLL when receiving data with 0 byte payload @HS
- ☼ Added support for backward references in $DM @HS
- ✓ Fixed error in creating simulation project in specifc cases @HS

5.3 Documentation generation

- ⓘ✗ Changed content of user documentation selected by Desktop-setting DT=0 (#2570) @HS
- ⓘ Enhanced navigation in documentation (#2571) @HS

- ☼ Added instance tree to documentation (#2572) @HS
- ⓘ Placeholder $:<modname>$ will create a link to the module documentation (#2573) @HS
- ☼ New placeholder $developer$ for comments only included into developer documentation (#2574) @HS
- ☼ Output directory of documentation can be set by DDD= for Developer documentation and UDD= for user documentation (#2577, #1046) @HS
- ⓘ Some optical changes and moved formatting to CSS-file (#2578) @HS
- ⓘ Timeouts for Ethernet connection are now adjustable by setting variables in General section of ini-file. firstResponseTimeOut sets the timeout for receiving first data. ResponseDuration-TimeOut sets the timeout for receiving the complete data, after the first data was received. @HS
- ☼ Support for Artefacts added. See Reference manual for further details (#2624) @HS
- ⓘ✖ Desktop setting DT removed. Use new setting DDT to determine the documentation level where the developer documentation starts and select the according documentation level in the editor. (#2624) @HS
- ⓘ✖ Desktop settings DDD and UDD replaced by setting DD (#2624) @HS
- ⓘ Artefact attributes support $DM (only for instance documentation, for module definition documentation $DM will be <$DM>. @HS
- ⓘ Same files will have same filenames on every run of documentation generation. @HS
- ✓ Fixed error of sometimes aborting documentation of items in action lists after procedure calls @HS
- ⓘ More predictable filenames in documentation generation. @HS
- ✓ Fixed errors caused by osdl.ini optimization. (#2643) @HS
- ⓘ Some changes to module tree @HS
- ✓ Fixed inheritance and sorting for Artefacts @HS
- ☼ Added support for multilingual texts in module documentation @HS
- ⓘ Placeholders are also supported in multilingual texts @HS
- ☼ Added documentation level support for ELEMENTs and SURFACE_VIS (#2650) @HS
- ✓ Module references are only included, when the modules are exported (according to documentation level) (#2650) @HS
- ✓ Look of state machines adapted to current version of editor (#2650) @HS
- ✓ Fixed crash on usage of custom aboutbox dialog @HS
- ☼ Added support for documentation level in DT_ENTRYs used to control export of Surface_CTRs @HS
- ☼ Artefact documentation will also be exported in tab-delimitted CSV file. @HS
- ⓘ✖ Module documentation will be generated for all instantiated modules regardless of documentation level. Documentation level will only affect links in generated documentation. @HS
- ⓘ Removed Element locations and hints to further instances @HS
- ✓ Element documentation in element tables considers documentation level of modules containing the elements @HS
- ⓘ Use info of module instead of submodule description for module documentation @HS
- ✓ Fixed crash in special case of drawing out of display @HS
- ⓘ✖ Element documentation comments will only be shown in developer documentation @HS
- ✓ Fixed crash for TextDefLinks with empty content @HS
- ☼ Language specific decimal separator based on implementation of LANGDEZPKT in runtime environment (#2670) @HS
- ⓘ Removed unnecessary empty header Intern and moved Interface documentation to developer documentation (#2671) @HS
- ☼ Added option –t to Documentation level of submodules to leave them out of module tree @HS
- ☼ Added counter to Artefacts @HS

- ☼ Added call to docgen_post.bat to execute actions after documentation generation (e.g. copy additional files to generated documentation @HS
- ☼ Added Desktop-Setting CF= to include an additional CSS-file in the generated documentation @HS
- ⓘ Module documentation of artefacts removed by standard. Can be inserted with $AT:<artefact-type>$ @HS
- ☼ Added support for backward references in $DM @HS

5.4 Editor

- ☼ Long text (LTXT) support added (#2080) @IS

5.5 Rad-Library

- ☼ Added `VersBoot` to show the current Bootloader-Version in System Overview. Therefore the API-Function `unsigned long GetBootloaderVersion()` must be available and is implemented in most frequently used uniAPI´s. All other API´s at least needs a dummy-function named also `unsigned long GetBootloaderVersion()` to return a valid value @BS
- ✓ Fixed a bug concerning setting metadata when using customized calib dialogs (see tvis_dialogs.rad) @BS
- ☼ The Protocol Show Module now permits scrolling up and down through the list. If the define RD_PROTSHOW_SCROLL is set to 1, pressing "UP" or "DOWN" starts a scrolling through the file and a second pressing stops the scrolling again. This functionality is released only for use with the 128*64 Display, since for larger displays a better solution (Page UP/DOWN) is available. @WD

- ☼ The MAPIMonitor Module has been added. It allows to monitor the API Loop counters on the Visualization. Requires an API conforming to the standard set for the loop counters. @WD
- ☼ A Soft watchdog Module has been added. It monitors the API Loop counters and if they are not incremented in a given time (a PAR), the Reset function ResetApplication() is invoked. Requires an API conforming to the standard set for the loop counters. @WD
- ☼ Added build ID @HS

5.6 API-Interface

- ⓘ✖ New IO-Interface, the new interface can be deactivated by setting Define RD_CUSTOM_IO to 1, which switches back to the old interface.
  For the new interface the following functions have to be implemented:
  void do_add(IO_const E_DO* edo);
  void do_sub(IO_const E_DO* edo);
  unsigned short di_get(IO_const E_DI* edi);
  short ao_getP(E_AO* eao);
  void ao_put(E_AO* eao, short phys);
  short ai_get(E_AI * eai);
  void cnt_set(E_CNT* ecnt, long val);
  long cnt_get(E_CNT * ecnt);

```
#if FLOWMETER!=0
        void flowm_get(FLOWPAR * pPar);
        void flowm_set(FLOWPAR * pPar);
#endif // FLOWMETER
```

Furthermore the new interface offers the following functions to be used from the HAL:
```
long cnt_readVal(E_CNT * ecnt);
void cnt_writeVal(E_CNT *ecnt, long val); // For writing values into the radCASE-structure
```
(not setting the hardware, use cnt_writeP for that. Can be used to update Counters from the hardware by calling:
```
ecnt = &(tab_e_cnt[i]);
cnt_writeVal(ecnt,cnt_readVal(ecnt));
```

```
short ai_readVal(E_AI * eai);
```

See integration manual for details on the new interface (@HS)

ⓘ Removed unusable Define IO_const, IO_const can be removed from API interfaces as well (#2267) @HS

ⓘ✖ Allow bigger data sizes. The following functions have changed interfaces:
short PutPersDataIntoCUS(unsigned char * pSrc, unsigned long BaseHandle, unsigned char Index, size_t size);
short GetLastValidPersDataFromCUS(unsigned char * pDest, unsigned long BaseHandle, unsigned char * pActualIndex, unsigned char maxIndex, size_t size);
(#2649) @HS

☼✖ Introduced the API-Function `unsigned long GetBootloaderVersion()` which must be at least a dummy-function with the return value "0". This function can be used to get the version of an implemented bootloader and depends on that used bootloader. So please ask the designer of your bootloader how to get this version (if supported) @BS

5.7 Custom Sim

☼ To use new socket interface the file sockets.c has to be added to the custom simulation project @HS

ⓘ✖ File for socket interface was renamed to rdsockets.c. The file in the custom simulation project must be changed accordingly. @HS

6　Release Version 4.12.0

6.1　Code generation + runtime library

- Redefinition of values for special keys in ctr_cons.h in order to avoid overlapping with the used Unicode codes. Now for special keys in ctr_cons.h used values from area 0x800-0x8FF @IS
- EEPROM error message denotes additionally "press any key to reset/format" @WD
- New type of display communication using display commands as display data transmitted. This type of display communication also supports color displays. To fully support this, make sure to not use any API drawing commands and use the wrapper functions instead. Use the new wrapper functions:
  SETLAYER() macro instead of c_dis_layer()
  c_cur_mode1() instead of c_cur_mode()
  c_cur_clear1() instead of c_cur_clear()
  c_dis_clr1() instead of c_dis_clr()
  c_dis_char1() instead of c_dis_char()
  c_dis_str1() instead of c_dis_str()
  c_dis_char161() instead of c_dis_char16()
  c_dis_str161() instead of c_dis_str16()
  Also still use the old wrapper functions:
  c_cur_movePos() instead of c_cur_move()
  c_cur_setPos() instead of c_cur_set()
  c_dis_clrrect1() instead of c_dis_clrrect()
  c_dis_bitmap1() instead of c_dis_bitmap()
  c_dis_rect1() instead of c_dis_rect()
  c_dis_line1() instead of c_dis_line()
  c_dis_circ1() instead of c_dis_circ()
  c_dis_arc1() instead of c_dis_arc()
  c_dis_bitmap1_rot() instead of c_dis_bitmap_rot()
  c_dis_area_init1() instead of c_dis_area_init()
  c_dis_save_area1() instead of c_dis_save_area()
  c_dis_restore_area1() instead of c_dis_restore_area()
  In addition to this the Defines RD_DISPCMD_COMMUNICATION, RD_DISPCMD_BUFSIZE and RD_DISPCMD_MAXRETRY have to be set correctly (refer to Reference Manual) (#2413) @HS
- screen->fRedrawGlobal replaced by global variable fExtRedrawAllTrigger. Also added new global variable fExtRedrawPartTrigger to trigger a partial redraw. (#2413) @HS
- Fixed transfer of 0 Byte files and some issues with file listings in file transfer @HS
- Added automatic updating of parameters after changes on target. Feature can be deactivated by default using Desktop-Setting APU=0. The Timing-Setting PU= was removed, because it is no longer needed. (#2380) @HS
- Added batch for cleaning up a project (#2366) @HS
- Added KEY_SETUP, KEY_QUICK and KEY_SELFTEST to supported keys @HS
- Fixed partial redraw for conditional surfaces (#2489) @HS
- Added function sdGetDirListing() for simulation – definition see Integration Manual @WD
- Fixed crash on using element names with only 1 character (#2492) @HS
- Fixed buffer overflow for many digital IOs. Removed generated Defines INV_MASK_DI1 - INV_MASK_DI10 and INV_MASK_DO1 – INV_MASK_DO10 (#2495) @HS

- ⓘ✖ The support for Imacs Protocol 4.09 and prior is only available if the define RD_LEGACY_COMMUNICATION is set in the design @WD
- ✓ Fixed font size for password protected elements @HS
- ✓ Fixed clear rectangle for element visualizer with horizontal alignment string left, string center and string right (#2488) @HS
- ✓ Fixed wrong generation of element structures, when element was used in a function accessing elements within a module array (#2510) @HS
- ✓ Fixed redraw of element for cursor "line select" in a menu, when selected element changes (e.g. by changing through toggle edit) (#2517) @HS
- ✓ Force size of communication payload to be a multiple of 4 to have lower chance of a variable being split into two communication blocks (danger of variable changed between to variable blocks) (#2515) @HS
- ✓✖ Positioning using –s fixed to consistent behavior. –s will now use the font size of the last visualizer having a font size (Text, Element-Text-Visualizer, AMenu). This does not include those visualizers within a picture. This will affect positioning with –s for menus with different font sizes within the menu and positioning outside of menus.
- ✓ Fixed crash when using unsupported element array within surface (#2533) @HS
- ✓ Fixed crash for empty element names in actions (#2537) @HS
- ✓ Fixed error messages for errors in C-Code within precompiler ifs (@HS)
- ✓ Added missing parenthesis around $*element for single instantiated modules @HS
- ⓘ Renamed Define VTYPE_ENUM to VTYPE_ELEM, to clarify the usage of the Define. For backward compatibility a Define VTYPE_ENUM will still be available. (#2408) @HS
- ✓ Fixed recognition of bar visualizers (previously VisBinIcons with Bar in the name would be recognized as bar visualizers) (#2339) @HS
- ⓘ Changed error message for missing debug IDs to a warning with more detailed explanations (#2546) @HS
- ☼ Added new Desktop-Setting DMR for setting debug message rate (#2463) @HS

6.2 Product framework

- ☼ The file name extension of the radCASE recoding files (rdf) is now customizable. To do that you have to extend the file config.ini with the section "[RecordingFile]" with the parameters fileExtension and fileFilter. If you want e.g. the extension xyz the parameters should look like this: "fileExtension=xyz" and "fileName=XYZ Data File" where fileName is the name/description of the file which is shown in the open or save dialog as filter. If you do not change config.ini, the extension defaults to "rdf". (#2466). @AD
- ✓ Fixed about box which has obscured the close button (#2465) @AD
- ✓ Fixed headline for system time in ASCII export (#2416) @HS
- ☼✖ Support for True Type Fonts has been added. See Integration Manual for details (still to be done). As a side effect, also the calling conventions for extended rectangles have been changed from function calls to Macros defined in RDMacro.h, allowing faster execution on most targets @WD
- ☼✖ Support for file transfer added. In standard configuration of ProductFrameworkConfig.xml the new file handling replaces the deprecated protocol download. If the old protocol download is needed, it must be enabled using a custom ProductFrameworkConfig. (#2253) @HS
- ⓘ✖ Data structure for True Type Fonts has been changed to allow Chinese and similar languages to be handled correctly. Requires new generation of font files. (#2452). @WD
- ☼ New type of display communication using display commands as display data transmitted. This type of display communication also supports color displays. The HAL has to support this feature. (#2413) @HS

- ☼ Added communication of touch position for remote operation of target (#2458) @HS
- ✓ Fixed rectangles on Surface_Vis (#2456) @HS
- ✓ Fixed an issue with vertical byte orientation in display communication introduced by #2412. (#2457) @HS
- ☼ Added automatic parameter update. Parameters will be communicated from target, when changed on target. This feature can be activated/deactivated by enabling disabling Automatic update of parameters at runtime (uid=647). (#2380) @HS
- ✓ Visualization aborts connection if wrong versions are detected and messages are only shown once (#113) @HS
- ✓ Dynamic version switching dialog made modal (#178) @HS
- ✓ Fixed saving of unsigned short SysParameters into XML-file (#2443) @HS
- ✓ Fixed loading parameters and system parameters from XML-file in simulation of targets without display (#2471) @HS
- ⓘ Added support for Date and time elements into Ascii-Export (#2421) @HS
- ✓ Fixed issue with Bit 32 of multiselective EBINs (#2477) @HS
- ⓘ Enhanced ITC-interface for sending data back (#1264) @HS
- ⓘ Enhanced error message for pid and lock file (#2409) @HS
- ✓ Fixed possible crash on target during display communication on changed parameters (#2485) @HS
- ⓘ sim.bat and vis.bat can be called with command line parameters for radMON (#2478) @HS
- ✓ Fixed arrow cursor in simulation @HS
- ⓘ Moved asynchronous communication events into main communication loop. This causes the communication to better attend to the interblock delay. (#2332) @HS
- ✓ Fixed simulation equation for setting values of EBINs (#2411) @HS
- ⓘ New Timing-Settings ACR=, DCR=, HCR=, and TCR= for better control of communication with target (refer to Ref-Manual). (#2333) @HS
- ⓘ Different rate settings will be reset to default, when default value changes in design. (#1032) @HS
- ✓ Fixed saving of settings of event notifier for external programs (#2507) @HS
- ✓ Fixed minor memory leak @HS
- ⓘ✖ Decoupled stimulation rate and display rate. Stimulation rate is now only used for simulation equations and evaluation elements. Display rate specifies data update rate in simulation and update rate of Local/Eva elements in visualization. The display rate of the visualization is determined by the communication speed of the elements. (#2335) @HS
- ✓ Fixed crash when starting in visualization mode and switching to simulation @HS
- ✓ If an error occurred during receiving the first parameter data block forcing the visualization to go offline, the visualization would still recognize a parameter block as received successful and test the received data, resulting in error messages of wrong parameter size. The check is now only done, when the block is really successful received. @HS
- ⓘ Enable single step mode independent of ERS license packet (#2522) @HS
- ✓ Prevent access of elements from module pointers in communication (instead of using offset of -1) @HS
- ☼ Passwords can be specified in design (#2460) @HS
- ⓘ Better password protection (#2460) @HS
- ✓ Fixed crash on resetting force mode on exit of simulation introduced with #2335. @✓ Fixed user defined help file (#1382) @HS
- ✓ Removed unusable Quick Access bar (#2036) @HS
- ☼✖ Permissions for accessing functions in Product Framework can be set in design. This replaces Desktop Settings PM=, MD= and PL=. Also the behavior of Custom product framework configs have changed: Password levels are no longer supported for a Panel and have to be specified for each element containing a UID. The password levels in the config now are only

the default values, if nothing else is specified in the design and for setting permissions in the design. See Reference Manual for more information on how to use the new permissions. (#155) @HS

✓ Fixed crash in special case of startup (#2547) @HS

✓ Better VS2015 C++ detection (#2545) @HS

☼ Added debug messages functionality (#2463) @HS

✓ Fixed crash on missing Surface_Vis(0) in System-module (#2562) @HS

ⓘ Elements with ComType V0 (not communicated) are marked with value 'X' in Text visualizers (#2391) @HS

✓ Fixed descriptions in rate settings (#2463) @HS

✓ Fixed reset all to default values in rate settings (#2463) @HS

6.3   Documentation generation

✓ Fixed error in documentation generation introduced with True type font support @HS

✓ Added KEY_SETUP, KEY_QUICK and KEY_SELFTEST to supported keys (#2501) @HS

✓ Fixed error with $private$-Replacements (#2549) @HS

☼✖ Added new $protected$-Replacement. $private$ can now be inserted at any position and ended with $/private$. It is no longer possible to nest a $private$ into another $private$. (#2554) @HS

ⓘ Automatically remove whitespace at end and beginning of comments (#2565) @HS

6.4   Editor

6.5   Rad-Library

☼ A new Module "MProtocollingMessages" has been added to Protocol7.rad. See inline docu for details @WD

ⓘ Selection of protocol shown now not longer by filename but by date @TK

✓ Cursor in SURFACE_CTR 50 (System Info) and 52 (Passwords) for display sizes VGA and QVGA now visible again (replaced undefined user cursor by standard cursor type 3) (#2529) @MG

ⓘ✖ The functions evaluateDiag() and ResetOrRestore() in tvis_dialogs.rad have been removed. There are no reasonable use cases in the standard surfaces for these functions. @WD

6.6   API-Interface

☼✖ If the Define _USE_SDCARD_ is set, some changes must be made to the existing SD-Card functions. The specifications of functions sdReadSomeData, sdRead and sdFileSize have changed. New functions sdGetInfo, sdGetDirListing and detachCallFileTransfer must be supported. Refer to integration manual for further details. (#2253) @HS

☼✖ New type of display communication using display commands as display data transmitted. This type of display communication also supports color displays. To support this communication in the HAL a RDN_CIRCULAR_DISPLAYBUFFER structure has to be instantated and initialized using Setup_Empty_Circular_Display_Buffer(). After this the Pointer dispCmdMem in the communication structure has to be pointing to that structure. One instantiation is need-

ed for every communication structure for which the communication should be supported. (#2413) @HS

screen->fRedrawGlobal replaced by global variable fExtRedrawAllTrigger. Also added new global variable fExtRedrawPartTrigger to trigger a partial redraw. (#2413) @HS

Added communication of touch position for remote operation of target. Targets with TOUCH_ON have to support the new function void c_touch_put(M_D_SCR short x, short y, short pressed). For more information refer to Integration manual (#2458) @HS

Added debug messages functionality. To use this the new debug message structure has to be instantiated and initialized for supported communication devices if Define RD_DEBUG_MESSAGES ist set to 1 (#2463) @HS

6.7   Custom Sim

7   Release Version 4.11.0

7.1   Code generation + runtime library

- ✓ Removed a warning because of unused variable for special case of settings @HS
- ✓ Fixed an error for standalone generation with Visual Studio 2008 without Service Pack 1 @HS
- ⓘ✗ For Display size VGA and QVGA, the Modul MTouch is now instanciated in Modul MMainDialogs of tvis_dialogs.rad. Therefore when using tvis_dialogs.rad (recommended) MTouch must not be instanciated elsewhere. @WD
- ✓ Fixed error with relative positioning in combination with ShowDialog (used for custom dialogs in tvis_dialogs.rad) (#2130) @HS
- ✓ Fixed saving of EEPROM data when an error occurs in one of the EEPROM data regions @HS
- ✓ Fixed error detection for size of EEPROM data regions @HS
- ⓘ Element texts are also exported for Formatstring EX=1 for an element. (#2118) @HS
- ⓘ Better error detection for mismatching Common/rc_lib for mismatches between versions with radGEN.exe and without. (#2101) @HS
- ✓ Fixed export of Processdata into memio.dok (#2138) @HS
- ⓘ✗ The brickBUS Interface functions ai_get_bB(),ao_getP_bB() and flowm_get_bB() – for the Flow – now generate a NOVALUE if the brickBUS is not communicating. @WD
- ⓘ✗ The file include_all.h is now included in bB_configs.h and an include path must be established to the location of this file and the bB_configs.h file. This is a prerequisite to use the brickBUS files also in a non-radCASE environment @WD
- ⓘ✗ Enhanced error detection for object version. Defines specified in rc_lib\Def\hwlCritical.txt may not be checked using #ifdef, #ifndef or #if defined. Instead the Define should be checked for the value 0. Undefined defines will be evaluated as 0. (#992) @HS
- ⓘ Added module pointer to RD_IDX_PNT_PRSV_TAB structure used for data preservation (#1942) @HS
- ⓘ T.bat renamed to createFonts.bat which can be called from every location and will generate the fonts into the calling directory. There is still a T.bat for backward compatibility. (#2100) @HS
- ⓘ Moved copy_sys.bat into arg_batches directory. @HS
- ⓘ✗ The brickBUS defines have been adapted to the actual specification of the bus, see bBConfigs_template.h for details. Main change is, that the Macro BB_BYTETIME has been replaced by the Macro BB_SYNCHGAP. Also the file bBDefines.h must now be included at the end of bBConfigs.h and is nowhere else included @WD
- ☼ Calibration functions can be overridden in application by using the function pointer fp_caliconvert in the according IO-structure. The pointer has the prototype:
  unsigned short (*t_caliConvertFP)(struct s_kaliio RD_MIO *io, void *unconverted, void* converted); (#2114) @HS
- ⓘ✗ The #defines FLOWMETER and FLOWM_LOCAL has been added to the list of critical #defines and will now be checked for the value 0. @BS
- ⓘ✗ The current brickBUS stack implementation uses protocol version 11. All other protocol versions of a slave will result in a bus error, the bus is then not operable @WD
- ⓘ✗ The defines "TRUE" and "FALSE" have been removed and have been replaced by 1 and 0 where they were used. This is necessary because many compilers and 3rd party software packages define TRUE and FALSE in a different manner. Some defies unused in RC_lib have been removed for the same reason. @WD

ⓘ✘ Improved error detection for data types of IOs, especially for Big-Endian targets (#2131) @HS

✓ Fixed warnings for empty IO structures (#2146) @HS

ⓘ✘ For the Persistent Data storage another option has been added : Custom designed storage. To enable this, the defines MGMT_CUS, TOUCH_CUS, PARAM_CUS, SYSTEM_CUS, PROC_CUS, REMA_CUS must be used, and 2 additional functions GetLastValidPersData-FromCUS() and PutPersDataIntoCUS() must be added to the API. See Integration Manual for details @WD

ⓘ✘ The #define USE_BRICKBUS has been added to the list of critical #defines and will now be checked for the value 0. @HS

ⓘ Metadata of elements is always exported for ComType Px (#2154) @HS

ⓘ Updating a Process Element via Imacs Protocol now immediately calls cFuncProcRestore() and the changed value will be stored persistent within the latency time of the update thread @WD

ⓘ A new function pointer HANDLEMESSAGEEXT pElementChangedCommands has been added. This function (if the pointer is set) will be called whenever an Element has been changed via the IMACS Protocol Interface @WD

✓ Fixed generation of selection masks for language in case of other EBINs with more than 32 selections and enabled selection mask (#2163) @HS

ⓘ Added timer for T_KEY_ABORT to header for external access (#2173) @HS

ⓘ✘ Removed flag FDiag. If needed T_KEY_ABORT has to be disabled manually in diagnosis, by deactivating the timer as described in Reference manual (#2160) @HS

ⓘ The Macros RD_DECL_OSDL, RD_OSDL_PNT and RD_OSDL can now be individually overridden e.g. in MEMORY.DEF @WD

ⓘ Added warning for exceeded maximum number of communicated elements (#2047) @HS

✓ Replaced multilanguage description of module definition with module ID in comments in generated code to prevent unreadable comments, which can cause problems for the compiler. (#2183) @HS

✓ Fixed crash in simulation of module pointer projects (#2182) @HS

✓✘ Fixed crash in module pointer projects with more than 5000 elements within indistinct modules. For module pointers the Bit 0x80 of elType is used to detect if the current element is accessed using offsets. So if using elType to identify the element type of an element within a module pointer project the elType has to be masked with 0x7F.
For elements in rdi_pnttab.c the additional flag isoffset in the RD_IDX_PNT_TAB structure can be used to determine if the element is accessed as offset. (#2182, #2189) @HS

✓ Fixed a timeout error for burst mode (#2179) @HS

ⓘ Added flag int_burst_hold to RDN_PROT_IFACE structure to pause burst mode on target side. Will need a custom communication DLL to not run into timeouts. (#2179) @HS

✓ Fixed several errors in Data Preservation @WD

ⓘ Added functions xx_isforced() which report wether an I/O port is forced or not @WD

ⓘ Added the new variables unsigned long GFlashOffset_ini ; unsigned long GFlashOffset_bmp ; unsigned long GFlashOffset_txt which are preset to either NULL or OSDLINI_OFFSET, OSDLBMP_OFFSET and OSDLTXT_OFFSET. The use of these macro names is therefore mandatory (these are the names generated by the UpdateHelpTool) and the use of the variables instead of the macros in the code is mandatory if a precompiled Runtime-environment / API is used. @WD

✓ Fixed crash on compiling a HWL-Version of a project compiled by another radCASE version (#2174) @HS

ⓘ Added radCASE-Version to checks in HWL-Version @HS

✓ Fixed an error for concatenated choices with multiple ingoing and outgoing transitions @HS

✓ Fixed weakness in EvalFlowMeter() : if Setup data was irregular, a division by 0 could occur @WD

- ⓘ Better error handling for function arguments for different processing types (#2210) @HS
- ⓘ❌ Imacs Protocol for Visualization now supports only the Protocol Module Protocol6.rad. The legacy and already long time removed protocols as prot5.rad are no longer supported @WD
- ✓ Fixed redrawing of screen when using a Full inside an if-Condition with redraw deactivated (#2220) @HS
- ✓ Fixed an issue with function parameters of nested unitstates caused by changes from #2201 (#2214) @HS
- ⓘ Language setting is now performed always in Surface Interpreter thread. This is necessary to avoid a possible deadlock in case osdl_ini is stored on an external device (#2205) @WD
- ☼❌ New CTR-setting FCL for setting font character limit for fontcompression. When using font compression the file name has changed from CharsOver800h.bin to CharsOverLimit.bin (#2246) @HS
- ☼❌ Placeholders are also replaced in element descriptions. Usage of the global strings RD_Global_wstrX have changed for different system function calls, so check if used in project (#2203) @HS
- ✓ Fixed endless loop in menus on direct key input (leading character) @HS
- ✓ Fixed missing module checks for some types of inheritance (#2259) @HS
- ☼ Element descriptions can be used to select an element using touch (#2211) @HS
- ⓘ Additional Define exported: VERT_NOT_HOR. This define is 1 if bitmaps are exported in vertical byte order and 0 if they are exported in horizontal byte order (#2258) @HS
- ⓘ Additional Define used: RD_USE_TEXTEXPORT. This define is 1 if a Module using the text export functions (line CElement_getDesc()) is used and relevant if no emb. HMI is present, because otherwise these functions will not be instanciated. @WD
- ⓘ Enhancement in BrickBus communication: BrickBus has to be initialized before the MOSI-Buffer will be filled and the MISO-Buffer is accessed. @AL
- ☼ The define IO_const used as prefix for E_DI and E_DO structures is always preset to "" by default It may be overridded e.g. in MEMORY.DEF. Reasonably it can be set to RD_CONST to transfer the structures into ROM. In this case, the define RD_DISABLE_DX_LOGIC must also be set because the dx_logic functions manipulate this structure and must therefore be disabled if the structures are RO @WD
- ⓘ❌ The protocol task (executePROT()) is now called from inside the Surface Interpreter. Thus it runs in the same thread as the Surface Interpreter and otherwise deadlocks when accessing text elements from an external device are avoided. It is therefore necessary to remove all separate threads invoking executePROT() in the HAL. For systems without HMI the executePROT() must be invoked regularly from a thread which replaces the HMI thread. (#2205) @WD
- ☼❌ The following functions have an additional Parameter "short showinHEX" : CElement_getActTxt(), CElement_ValToTxt(), CENum_ValToTxt(), enum2str(). If this Parameter is 1, numbers are displayed in hexadecimal notation (supposed RD_NO_HEX is not set), if it is 0 in decimal notation. @WD
- ⓘ act-Pointer in E_DI and E_DO structures also available for targets without HMI (#2281) @HS
- ⓘ❌ The function testPassWord() is no longer available if RD_NO_STDEDIT is defined, since it is always replaced by a custom functrion in such a case @WD
- ✓ Fixed a possible endless loop when using beginning character to navigate in a menu, shortly after scrolling with a key, which does not match any line (#2287) @HS
- ✓ Fixed clear rectangle for ESTRs with size visualizer (#2287) @HS
- ⓘ Not using multicolumn menus will turn the code for multicolumn menus off (#2287) @HS
- ⓘ Added Define RD_BIGENDIAN. The Define is 1 for Motorola format and 0 for Intel format (#2268) @HS
- ✓ Fixed a compiler issue with Microchip XC16 compiler with protocols (#2294) @HS

☼ A new function void SetMenuCursorVisible(unsinged char now) has been added. If "now" is 1, Cursor will be drawn as up to now. If now=0, drawing of the Cursor is suppressed until SetMenuCursorVisible(1) is called. To make this setting effective, a redraw of the Surface must be forced. @WD

ⓘ ForceMode functions now are fully integrated also if NO_EMB_HMI is set. @BS

ⓘ Enabling or disabling of sending single system parameters and/or system parameter in blocks has been split: to disable setting of single system parameters set #define RD_NO_SYSPARUPDATE. For disabling setting of system parameter blocks set #define RD_NO_SYSPAR_BLOCKUPDATE. @BS

ⓘ Moved global variables RD_Global_wstrX from module.c to vis.c (#2313) @HS

✓✗ Access to unique variables in variable pool fixed for variables accessed in FULLs. Access to those variables no longer goes over VARPOOL<TYPE>(GUniquePoolOffset + <idx>) but using the new macro GETUNIQUEPOOLVALUE(type, idx) where type is the C-data type of the variable to access. (#2322) @HS

✓ Fixed menus for using conditions with cursor type 5 (#2325) @HS

ⓘ Added debugging output for Visual Studio detection (#2320) @HS

ⓘ Communication for PC Visualization: It is now possible to enable/disable the use of the checksum in the communications protocol independently of the setting ETHERNET_ON by setting the element fEnableChksum in RDN_PROT_IFACE as desired.
So far, the checksum could not be disabled if ETHERNET_ON was not set.

ⓘ✗ In a Menu, when the value of an item has changed only the value and no more the description and the units are redrawn. This avoids the previous flickering on certain targets. UVisObj_drawMenu() has modified calling convention. @WD

✓ The values rdFullptrIndex, rdFullptr[] und rdModulptr[] are now saved on recursive call of do-SurInterperter() and restored thereafter @WD

ⓘ✗ The pointer pGPassUser, pGPassAdmin, pGPassTech, pGPassSuper, pGPassImacs, pGSound, pGVersSys, pGVersKali, pGVersSoft, pGVersPar, pGVersProc are now set in Modul MRoot. Therefore if System module is derived from MRoot as recommended, there is no need to set these pointers in ModulInit() in usercode.c anymore. @WD

☼ A new function has been added : void quickkali(short index, short physValue, short information). This is for a fast calibration in the production cycle, using partly the default values. See Integration Manual for details. @WD

ⓘ✗ RD_fModified is now evaluated for calling cFuncAskOk() even if RD_NO_STDEDIT is set. It is the responsability of the author of the custom specific editing functions to set RD_fModified correctly. @WD

☼ The define RD_NO_COLOR is now supported completely, see Integration Manual 3.3.4.3. for details (#1799) @WD

☼ The function setActCtrLanguage() has been enhanced to work properly if No HMI is used, but CE=1 is set. This is required for Devices having no HMI, but other Text output, e.g. as csv file to SD card. As a side effect, it is no longer required to set EV=1 for the Language, if no runtime modifications of the selectable languages are required @WD

✓ Fixed bug with wrong precompiler detection (#2363) @HS

ⓘ The PGUP- / PGDN function in a Menu has been improved, it worked previously only if all items had "-s" as distance. It is currently not verified for multi-column-Menu, therefore PGUP and PGDN in multi-column-Menu has undefined behavior. @WD

ⓘ Added error message for trying to use $* on elements without exported element structure (#2360) @HS

✓ Fixed overwriting of MAX_CTR_TEXT_LEN using a Define (#2368) @HS

✓ Fixed endless loop for RD_NO_BLINK @HS

✓ Fixed full offsets when opening a surface from a positioned full (#2374) @HS

- ⓘ Better error detection for invalid settings regarding module pointers without RDIs (#2362) @HS
- ✓ Fixed centered position for multiline texts (#2397) @HS
- ☼ Added $-Syntax for calling of Signalcharts (#2401) @HS

7.2 Product framework

- ✓ Fixed error with license file caused by changes in code generator for object version error detection (#992) @HS
- ✓ Batches in Standalone will check for .NET 3.5 SP1 instead of .NET 3.5 @HS
- ✓ Fixed rounding error on committing ENUM values to controller (#2090) @HS
- ✓ Fixed error in language selection for Arabian, Slovakian, Bulgarian, Hebrew and Romanian (#2151) @HS
- ⓘ Increased maximum number of communicated elements to 25 000 (#2047) @HS
- ✓ Fixed dynamic version switching @HS
- ⓘ Check for parameter data moved after dynamic version switching (#179) @HS
- ⓘ Separated product framework from Common to standalone radMON.exe. This results in a slightly better performance of the product framework and prevents errors in other components to render the product framework useless. Also it paves the road for future enhancements of the product framework. (#2037) @HS
- ⓘ✗ Removed deprecated visualizers VMNOcxZ1 and VMNocxG1. Don't use these visualizer types anymore (#2037) @HS
- ⓘ✗ Removed deprecated desktop setting LP= (Linearity protocol) and PK= (PC calibration). (#2037) @HS
- ✓ Fixed wrong mismatch of modul.xml and struct.lst for nested unistates (#2214) @HS
- ✓ Fixed saving of eeprom data, after eeprom error message was shown (#2225) @HS
- ✓ Fixed virtual keys on Surface_Vis that didn't work after #2037 (#2230) @HS
- ✓ Fixed display error of date elements caused by #2037 (#2231) @HS
- ✓ Fixed display error of rotating visualizer caused by #2037 (#2231) @HS
- ✓ Fixed display of unit of default value in element info caused by #2037 (#2231) @HS
- ✓ Fixed mouse movement for rotating visualizer (#2231) @HS
- ✓ Fixed displaying of times and dates in control panel (#2236) @HS
- ⓘ Added error message for standalone generation when additional redistributables installation is needed (#2209) @HS
- ✓ Fixed Desktop setting VA=1 (#2244) @HS
- ✓ Fixed crash of cclConnection.dll when it receives specific wrong data (#2305) @HS
- ⓘ Updated to protocol version 4.11 (automatic keepalives in Burst mode) (#2295) @HS
- ⓘ Added force mode support for AI, DI and CNT (#2307) @HS
- ⓘ Replaced error message for missing redist directory in standalone generation with attempt to copy DLLs from System32 directory (#2317) @HS
- ✓ Fixed error with missing DLLs in standalone generation when using VS2012 @HS
- ☼ It is possible to start multiple instances of radMON at the same time, from different directories (#2346) @HS
- ✓ Fixed extensions for saving/loading data recordings (#2329) @HS
- ✓ Fixed crash when using data preservation without data to be preserved (#2358) @HS
- ✓ Fixed deadlock which could appear in combination with histograms (#2355) @HS
- ✓ Fixed E-Mail event notifier (#2372) @HS
- ⓘ Locals can also be used in different Actions like Set or Inc. They can now be used in all places a Flag can be used within the visualization (#2378) @HS

- ✓ Fixed error when multiple EBin had a value of 0xFF (wrongly detected as NOVAL of a normal EBin) (#2392) @HS
- ✓ Fixed system parameter communication to big endian targets @HS
- ✓ Fixed rounding error for conditions in Surface_Vis (#2417) @HS
- ☼ Added Visual Studio 2015 Support (#2400) @HS
- ✓ Fixed standalone generation for Windows XP support in Visual Studio versions 2012 and upwards @HS
- ⓘ Added some debug output for version dynamic switching to logfile (#2419) @HS

7.3 Documentation generation

- ✓ Fixed an endless loop, for nested $CM:§parent$ (#2126) @HS
- ✓ Removed error message on missing statmach.txt @HS
- ✓ Fixed error in inheritance on overwriting functions (could be detected as double defined function) (#2195) @HS
- ✓ Fixed crash after runtime kernel message @HS
- ✓ Fixed sporadic crash on some projects @HS

7.4 Editor

- ✓ Settings dialogs updated and corrected (Project – SystemDef – Settings: System Code / Timing / Ctr / Desktop) (#2405;#1788, #2402, #2406) @IS
- ✓ Old preprocessor directive handling (#if ...) available again. It can be enabled in the radEDIT

  menu Tools - Settings – TAB Editor. Note: This option should only be enabled if existing projects use the old handling and design compiler errors occur due to that after updating radEDIT(#2410) @IS.

7.5 Rad-Library

- ⓘ✗ Added some #defines to fix compiler errors when using tvis_dialogs.rad and some combinations of Systemcode-Defines (RTC_ON, KALI_ON, DIAG_ON). Furthermore the #define RD_MODALDIALOG is now set in design application(project file) @AM
- ⓘ Added new KALI-Surfaces for DISP_128x64: it is now possible to use calibration in teach mode or in manual edit mode. As part of this additions some general functions has been improved. @BS
- ✓ Fixed handling of missing Calibration- or Diagnosis-Element. The system will not crash anymore if dependent ELEMENT does not exist. @BS
- ⓘ Improved detection of editing an EBIN or MultiEBIN when using tvis_dialogs.rad @BS
- ✓ Fixed a bug in Protocol6.rad when using SD-Card functions in module MProtocolSdcCsv and the option of LFN (long file names) @BS
- ✓ Fixed missing UNICODE/UTF8 handling in Protocol6.rad (#2150) @BS
- ⓘ Improved inline documentation of tvis_dialogs.rad (#2148) @BS
- ⓘ✗ The including strategy of certain files has been modified. You must include the following files preferably in your System file :
  If you have set DISP_VGA in your design : tvis_dialogs_vga.rad and tvis_global_vga.rad
  If you have set DISP_QVGA in your design : tvis_dialogs_qvga.rad and tvis_global_qvga.rad

In all other cases : tvis_dialogs.rad and tvis_global.rad   @WD

New headline for QVGA and VGA Surfaces :
If DISP_VGA or DISP_QVGA is set in the design and either MRoot from std_system.rad or modules from the radLib are used, a Surface_CTR(91) must be declared in the system module. This should include Surface_CTR(90) from MRoot as FULL and should show general process parameters in the left half of the headline   @WD

Added API-Version to be shown in System Overview. This APi version must be defined as "define RD_APIVERS" to be shown, if it is not defined, a Version 0 is indicated. In IMACS Standard API's, this define is automatically generated in a file version.h in the API directory, therefore for these Applications the file version.h must be included properly, e.g. in usercode.h @WD

There are now 2 protocol libraries available : Protocol6.rad supports binary storage of protocol data while Protocol7.rad supports only storage of protocol as csv file (not available for internal memory). Only one of those may be included. @WD

The Element Device ID (Anlagenkennung) previously part of MModem is now Part of MRoot and therefore available in all applications using MRoot as base moduletype for the system module as recommended. @WD

The Dialogs for diagnosis and calibration on Surfaces >128*64 are enabled by setting the Systemdef - define DIAGKALI_DIALOGS_ON to 1 @AM

For Screens >= 240*320, the Surface_CTR(91) shall always be used as headline. This Surface is to be overridden in derived Modules (usually System) while Surface_CTR(90) is the Surface holding the standard Headline @WD

The former file tvis_dialogs.rad has been splitted into 2 files : tvis_dialogs.rad containing basic modules for all screen sizes and tvis_dialog_128x64.rad containing the surfaces for a monochrome 128x64 display (as already existing for _qvga and _vga). Therefore the include "tvis_dialogs.rad" must in most cases replaced by "tvis_dialogs_128x64.rad" @WD

Added `Protocol_lang.rad` to specify the protocol language that may differ from the actual HMI language. @BS

Added functionality to detect and show the Hardware ID. The Hardware ID is determined by a resistor network in the hardware and read via an AI. It can be seen in the system menu. Setting the #define "RD_NO_HWID" disables this code. @WD

Message - Boxing is displayed when an element has the property "Not editable". If user attempts to edit the item. @AM

Passwords of the controller can now be edited in the target HMI (added SURFACE_CTR(52) in MRoot, which is called from the System info page (SURFACE_CTR(50)). @MG

Calibration data can now be saved to a SD Card as a binary image and written back again from SD Card to the system. (#2321) @BS

Added explicit cast's in function "c_touch_calib" that is needed with microchips XC16 compiler. @BS

The calling convention of MDialogs.displayUnit() and MDialogs.displayVal()has been modified, the foreground color is now a parameter instead of fixed black @WD

The Surface Numbers in tvis_dialogs128x64 have been changed to be identical to those in larger displays. Consequently, calling functions in tvis_dialogs have been modified. Thus no crash in using large displays and dialogues from tvis_dialogs128x64 will appear any more @WD

If using `RD_NO_TOUCH_CALIB 1`, a specific calibration-set must be set and the new `cFunc-TouchSetup()` will be called on every start of the application. @BS

Fixed bug in sig_digital.rad : EDGE-Function a $ for the element in formula was missing @WD

7.6   API-Interface

- ⓘ✖ It is possible to also export element texts on targets without HMI. Because of this, the osdl.txt will now also be exported for targets without HMI and will at least contain XTXT-Entries and if not deactivated the system texts. If no texts are needed on a target without HMI please make sure, the osdl.txt is not converted to binary data and put in the ROM of the target (#2118) @HS

- ⓘ✖ Enhanced error detection for object version. Defines specified in rc_lib\Def\hwlCritical.txt may not be checked using #ifdef, #ifndef or #if defined. Instead the Define should be checked for the value 0. Undefined defines will be evaluated as 0. (#992) @HS

- ⓘ✖ The file include_all.h is now included in bB_configs.h and an include path must be established to the location of this file and the bB_configs.h file. This is a prerequisite to use the brickBUS files also in a non-radCASE environment @WD

- ⓘ Added error checking for wrong compiler setting (char as unsigned char) @HS

- ⓘ✖ The brickBUS defines have been adapted to the actual specification of the bus, see bBConfigs_template.h for details. Main change is, that the Macro BB_BYTETIME has been replaced by the Macro BB_SYNCHGAP. Also the file bBDefines.h must now be included at the end of bBConfigs.h and is nowhere else included @WD

- ☼✖ Calibration functions can be overridden in application by using the function pointer fp_caliconvert in the according IO-structure. The pointer has the prototype:
  unsigned short (*t_caliConvertFP)(struct s_kaliio RD_MIO *io, void *unconverted, void* converted);
  The old calibration functions iocaliPhys2Log, iocaliPhys2Log_L and iocaliLog2Phys are all replaced by the according function pointer and will map by default to functions which will do the same logic. The Define KALIIO was also removed. To detect the correct radCASE version the Defines rC_VERSION and RD_REV_NO can be used. (#2114) @HS

- ⓘ✖ The #defines FLOWMETER and FLOWM_LOCAL has been added to the list of critical #defines and will now be checked for the value 0. @BS

- ⓘ✖ The current brickBUS stack implementation uses protocol version 11. All other protocol versions of a slave will result in a bus error, the bus is then not operable @WD

- ⓘ✖ The defines "TRUE" and "FALSE" have been removed and have been replaced by 1 and 0 where they were used. This is necessary because many compilers and 3rd party software packages define TRUE and FALSE in a different manner. Some defies unused in RC_lib have been removed for the same reason. @WD

- ⓘ✖ For the Persistent Data storage another option has been added : Custom designed storage. To enable this, the defines MGMT_CUS, TOUCH_CUS, PARAM_CUS, SYSTEM_CUS, PROC_CUS, REMA_CUS must be used, and 2 additional functions GetLastValidPersDataFromCUS() and PutPersDataIntoCUS() must be added to the API. See Integration Manual for details @WD

- ⓘ Updating a Process Element via Imacs Protocol now immediately calls cFuncProcRestore() and the changed value will be stored persistent within the latency time of the update thread @WD

- ⓘ✖ The protocol task (executePROT()) is now called from inside the Surface Interpreter. Thus it runs in the same thread as the Surface Interpreter and otherwise deadlocks when accessing text elements from an external device are avoided. It is therefore necessary to remove all separate threads invoking executePROT() in the HAL. For systems without HMI the executePROT() must be invoked regularly from a thread which replaces the HMI thread. (#2205) @WD

- ✓✖ The calculation of DISPMEM_SIZE has been modified, it produced to small values if the vertical or horizontal size was not on a 8 – boundary @WD

- ⓘ Function SetOutput() not needed anymore (#2307) @HS

7.7   Custom Sim

Made some preparations for implementing new font handling:
- Added fontdisplay.c, RDMacros.h and ctr_font.h to project
- Added fontdisplay.obj to sys.lib and sysd.lib

8   Release Version 4.10.0

8.1   Code generation + runtime library

- ✓ fixed bug in SysInit(). Failed with object version, if REMANENT_LEN was different compared to the time of creation of the object version. @WD
- ✓ Fixed usage of Procedure calls from surfaces when calling a procedure within a multiple instanced module from another multiple instanced module. @HS
- ⓘ RDI_GLOB.IDX allows comments beginning with a semicolon until the end of the line. @HS
- ✓ Fixed Overflow in CEBin_getMultiSelStr(). @WD
- ☼✗ The brickBUS Initialisation now generates the Timeout factor to be transmitted during communication setup on the bus. This requires an additional define to be set in bBConfigs.h. The generated value may be overridden by the application, e.g. in an INIT procedure. @WD
- ⓘ Added more explicit #ifdef in RdnComm.c concerning protocol support enabling. @BS
- ✓ Fixed linker error when RD_NO_TIMEDATE is set without setting RD_NO_STDEDIT (#1877) @HS
- ✓ Fixed an error in inheritance. Error occurred, when overwriting the second or following modules of a base module. @HS
- ✓ Fixed Endstate in Statemachines (#1878) @HS
- ✓ Correct limit of maximum selections in EBINs and according error message @HS
- ✓ Fixed usage of RDIs over 32767 @HS
- ✓ Fixed generation of act-Pointers for DIs/DOs on targets without HMI (#1868) @HS
- ✓ Fixed crash on using custom About-Box or dynamic version switching message (#1916) @HS
- ⓘ Separated model code generator from Common to standalone radGEN.exe. This results in a slightly better performance of the code generator and prevents errors in other components to render the code generator useless. Also it paves the road for future enhancements of the code generator. (#1898) @HS
- ✓ Fixed generation of RDI-Pointers for elements within submodules of module-arrays (#1926) @HS
- ✓ Fixed sending of cursor positions for text displays in PC-target communication @HS
- ☼✗ Extended RDI usage to use RDIs up to 65534. The index of al RdWrEvtxxx-Functions is now an unsigned short instead of a short. (#1927) @HS
- ⓘ Restore local surface enable bits before calling RDfp_updateUserCursor.This prevents problems to use if-endif´s in a customized menu cursor function. @BS
- ✓ Fixed possible errors originating from adding automatically semicolons after some statemachine code objects, which can cause problems with preprocessor directives at the end of those objects (#1923) @HS
- ✓ Fixed error in inheritance on overwriting functions (could be detected as double defined function) (#1951) @HS
- ✓ Added cast to prevent errors using microchip´s XC16 compiler in case of using multiline text´s. @BS
- ✓ Fixed export error of _pMod in special case of inheritance (@1508) @HS
- ✓ Fixed order of export for global C code and global declarations, so that inherited code is always before own code (#1961) @HS
- ✓ Fixed an alignment problem in precalculation of expected sizes of PAR/SYS/PROC structs, which is used in communication. (#1955) @HS
- ✓ Fixed export order for global code and procedures for inheritance. All global code is exported before any procedure. (#1970) @HS

✓ Fixed access to visualizers in module pointers for 32-Bit processors and simulation (#1969) @HS

ⓘ Command `VCM_SET_OUTPUT` in Imacs-Protocol is not supported if define NO_FORCEMODE is set @WD

ⓘ⚒ Some modifications for brickBus implementation. USE_BRICKBUS must now be defined as "1" in the SystemDef section to enable brickBUS support. File bBConfigs.h is no longer included in bBDefines.h @WD

ⓘ Removed Ctr-Setting EA=<0/1> @HS

✓ Fixed an export order error in special case of inheritance (#1987) @HS

✓ Fixed usage of AKEYGLOBALS in combination with menus. @HS

ⓘ Update of time visualizers is only made, when the shown parts change (#1966) @HS

ⓘ Added new function pointer `RDfp_belongsToUserCursor` to optionally affect drawing/not drawing the menu items of a customized menu (if `RD_MENUUSERCURSOR` has been defined). The assigned item will explicitly not be drawn by `CVisMenuBegin_write` if function return is >0 @BS

ⓘ⚒ Moved visualizer objects from source.c to osdl.ini and optimized some memory. This results in quite a few possibly needed changes:

- All CVis-structures are no longer existing and the information is moved inside the according DVis-structure. There is the union UVisObj which is a container of all possible DVis-structures. See vis_typ.h for explanatios on the different structures.
- Different changes in the structures of the Actions. There is also the new union UAction which combines the different possible actions. See act_typ.h for further explanations on the structures.
- If using an external flash for osdl.ini the macros have changed:
  - Customizable Macro OSDL_BIN_DATA does no longer exist
  - RD_GET_OSDL now gets an Offset and must make the pointer calculation previously done by OSDL_BIN_DATA. This macro can now be overridden by a custom Define
  - Defines SET_SEF, GET_DEF and GET_DEFX are removed. The RD_DECL_OSDL-Macro combination is used instead.
  - New macro RD_OSDL_PNT(type, name) for passing pointers to a RD_DECL_OSDL
  - Macro RD_OSDL_REF was removed
  - New Macro RD_OSDL_DIRECT_ACCESS(type, index) for getting a direct pointer (only usable without external flash, is used by design compiler when Setting EMA=1 is activated).
- New Define RD_NOBINDATA which defines an invalid offset in binary data (e.g. for signaling the end of a chain in the binary data).
- Define RD_PROPFONT is only allowed as setting in the Design and not in an external file like memory.def anymore.
- USERFUNCs are no longer supported for a SURFACE_CTR. Use PROCEDUREs instead.
- For a custom cursor or scrollbar in a menu, the three interface functions have changed:
  - RDfp_drawUserScrollbar has now the function prototype
    void (*RD_USERSCROLL_FUNC)(M_D_SCR DVisMenuBegin
    RD_MBIN *thisvis, short itemCount);
  - RDfp_updateUserCursor has now the function prototype
    void (*RD_USERCURSOR_FUNC)(M_D_SCR DVisMenuBegin RD_MBIN
    *thisvis);
  - RDfp_belongsToUserCursor has now the function prototype

> char (*RD_BELONGSTOUSERCURSOR_FUNC)(DVisMenuBegin
> RD_MBIN *thisvis, short itemIdx);

- The offset in the variablePool for startLineIdx and actLineIdx of a menu is no longer the absolute offset, but the offset within the unique part of the variablePool. So to get the correct value, when using the Macro to access the value, the variable GUniquePool-Offset has to be added to the according offsets. (e.g. VARPOOL-SHORT(GUniquePoolOffset + thisvis->actLineIdx))

- The following functions and variables were renamed (and interfaces changed as follows:

  - short CVisElem_getFormatItem(CVisObj RD_MROM *vis, …
    => short DVisGElem_getFormatItem(DVisGElem RD_MBIN *vis, …
  - CVisObj RD_MROM *RDActVis
    => DVisSElem RD_MBIN *RDActVisElem
  - CElement_getActTxt() Parameter 4 char ausrichtung was removed
  - void CVisObj_getPos(CVisObj RD_MROM *vis, …
    => vois UVisObj_getPos(union UVisObj RD_MBIN *vis, …
  - CVisObj RD_MROM *CVisObj_nextEnabledMenuItem(CVisObj
        RD_MROM*vis…
    => XPTR UVisObj_nextEnabledMenuItem(XPTR nextIdx,
        RD_OSDL_PNT(union UVisObj, vis)…
  - void CVisMenuBegin_getOldCurPos(M_D_SCR CVisObj RD_MROM
        *startvis, CVisObj RD_MROM **cursorvis…
    => XPTR visMenu_getCondSafeMenuitemPos(M_D_SCR XPTR startvisIdx,
        RD_OSDL_PNT(union UVisObj, cursorvis)…
  - void CVisMenuBegin_getCurPos(M_D_SCR CVisObj RD_MROM *startvis,
        CVisObj RD_MROM **cursorvis…
    => XPTR visMenu_getMenuitemPos(M_D_SCR XPTR startvisIdx,
        RD_OSDL_PNT(union UVisObj, cursorvis)…
  - void CVisObj_drawMenu(M_D_SCR CVisObj RD_MROM *thisvis…
    => void UVisObj_drawMenu(M_D_SCR union UVisObj RD_MBIN *thisvis…
  - CEBin_getSelStr() Parameter 4 char ausrichtung was removed
  - void CVisObj_getHeight(CVisObj RD_MROM *vis…
    => void UVisObj_getHeight(union UVisObj RD_MBIN *vis…

  (#234) @HS

ⓘ✂ Runtime dynamic elements now also usable with an external flash
The initialization of a runtime dynamic element has to be changed. E.g. for an ENUM:

```
DENum varMetaDataENum; // global variable
RD_DECL_OSDL(DENum, def);
RD_GET_OSDL(DENum, $*ENumRtDyn->elem.elel.def, def);
memcpy(&varMetaDataENum, &(RD_OSDL(def)), sizeof(DENum));
$*ENumRtDyn->def = &varMetaDataENum;
$*ENumRtDyn->elem.elel.def = RD_NOBINDATA;
```

After this the metadata can be changed using $# syntax (#234) @HS

✓ Fixed vertical positioning after \n for unicode characters (#1884) @HS

ⓘ✂ The most commonly used defines for the hardwareID in the IO assigns are now defined in ctr_io.h and must no longer be defined in the individual project (e.g. in usercode.h) @WD

ⓘ The structure definitions E_DIP and E_DOP have been removed. These structures are no longer supported by the Design Compiler @WD

ⓘ The Info text of a function is now used as Comment of a function in the generated code. The comment allows for Doxygen-Style comments, by just using the keywords without the asterisks (#1918) @HS

- ✓ Fixed an error in condition handling for Surfaces with Fulls and Menu (#2020) @HS
- ✓ Fixed errors in combination with conditional surfaces and VisLine/VisRot and VisRotXY visualizers (#2021) @HS
- ✓ Fixed a crash for not found modules in Fulls (#2026) @HS
- ⓘ brickBUS now retaines size information during re-init. @WD
- ✓ Fixed an error in calculation of offsets in Variable-Pools of Fulls. @HS
- ✓ Fixed crash on unknown text visualizer. @HS
- ☼ Touch-Support for multiple elements in one menu line. (#2005) @HS
- ⓘ Not found elements within precompiler conditions don't throw a warning anymore. Instead a precompiler error is generated into the generated code (#1979) @HS
- ✓ Fixed crash on too long element visualizer display type (#1895) @HS
- ✓ System directory is created if it does not exist in CTR (#1875) @HS
- ⓘ Throw an error for invalid combination of UU=1 and AL < 4 (#2004) @HS
- ⓘ✖ Pointers for custom functions moved into rc_lib. Now they don't have to be defined in the usercode.c and can just be set if needed. This affects the following pointers:
  CElement_P_edit_dialog, CElement_P_edit_toggle, CElement_P_edit_dauer, CElement_P_edit_action, RDfp_PasswordTest, RDfp_SetRtcTime, RDfp_SetRtcDate, RDfp_WarnAskOk, RDfp_AskOk1, RDfp_AskOk2, RDfp_AskDel, RDfp_DiagDi, RDfp_DiagDo, RDfp_DiagAi, RDfp_DiagAo, RDfp_DiagCnt, RDfp_KaliAi, RDfp_KaliAo, RDfp_KaliCnt
  (#2038) @HS
- ☼ New function pointer to customize edit mode focus:
  E_EDIT CElement_P_edit_focus (#2038) @HS
- ✓ Persistent storage in RAM failed in Simulation. Therefore in this case for Simulation Offsets in EEPROM or FLASH must be defined for Simu. RC_lib now throws an error if this is not done instead of writing arbitrary into RAM (#2046) @WD
- ⓘ Mutliple module definitions with the same name are detected and result in an error message (#2048) @HS
- ⓘ Added an unsigned long cast to parameter of RD_READ_OSDLINI-Function to prevent overflow when reading higher offsets of external OSDL.INI data. @BS
- ⓘ Key-Abort by default deactivated within Diagnosis or Calibration screens (#2043) @HS
- ☼ A new define NO_PERSISTENT_DATA has been introduced. If set, Persistent Data handling is disabled and no data will be retained on Power off @WD
- ☼ Added support for new feature Longtext for EStr (#2055) @HS
- ☼✖ Added support for ActionIcons in Menus. For this the prototype of function UVisObj_drawMenu had to be changed from
  void UVisObj_drawMenu(M_D_SCR union UVisObj RD_MBIN *thisvis, short menuindex M_D_COL M_D_COLBK M_D_COLOVR);
  to
  void   UVisObj_drawMenu(M_D_SCR union UVisObj RD_MBIN *thisvis, short menuindex, unsigned char selected M_D_COL M_D_COLBK);
  where the parameter selected determines if the menu item is currently selected with the cursor (#2063) @HS
- ☼✖ Added support for multicolumn menus. The size of the menu was removed from the variablepool and the indizes from the metadata of the menu. So instead of using VARPOOL-SHORT(thisvis->sizeXIdx) use thisvis->xr - thisvis->xl and instead of using VARPOOL-SHORT(thisvis->sizeYIdx) use thisvis->yo - thisvis->yu instead. (#2065) @HS
- ✓ Fixed possible crash for nested module pointers (#2068) @HS
- ☼ Added interface function for setting the cursor in a menu, to a specific position: void setMenuCursorPosition(short column, short line);
  The column and line to specify are 0 based. (#2070) @HS

✓ ✗ Renamed Define RD_NO_MULITEBIN to RD_NO_MULTIEBIN (#2060) @HS

ⓘ ✗ Desktop Setting RV= removed, because it is not needed anymore. Make sure all target data is moved to CTR-directory. (#923) @HS

✓ Fixed generation of some binary data in Motorolla Format @HS

ⓘ Diagnosis and calibration dialogs show 5 digits for AI and AO raw values (#2095) @HS

8.2   Product framework

✓ Fixed memory format of exported XML file for saved parameters, if exported from simulation in a project with Motorola format. @HS

✓ Fixed wrong positions of section descriptions in the module view @HS

✓ Fixed copying of font files to simulation in case rc_lib is on another drive than the project @HS

✓ Fixed a possible buffer overflow in simulation @HS

ⓘ Changes in connection settings for Ethernet and Serial can now be changed without restart. @HS

ⓘ Some optimizations for getting faster Ethernet communication (reduced number of send commands / removed 4 Byte length / optimized for not running into delayed ACKS / disabled Nagle / removed Checksums) @HS

✓ Fixed creating of simulation for PATH-environment variable with double quoted paths @HS

✓ Fixed crash on start of visualization, if an element with toggle edit is displayed in main window @HS

✓ Fixed disabling of element edit for toggle mode (element was greyed out, but could still be incremented/decremented using arrows) @HS

✓ Fixed $DM for VisBinIcons (#1883) @HS

☼ Cutomizable communication buffer sizes for communication. (#1896) @HS

☼ Enabled communication of display data for monochrome displays over Ethernet (#1896) @HS

☼ Changing communication settings no more needs a restart of visualization (#1896) @HS

ⓘ ✗ Timing setting AR= (Acquisition rate) replaced by new setting IBD= (Inter block delay). The Acquisition rate tried to get a specific rate at which a whole communication cycle was done and mostly failed in doing so. The new setting sets a delay between each communication block of the periodic communication so the stress caused on the controller is controllable. Attention: There are some asynchronous events which will still transfer data in those delays. (#1896) @HS

✓ Fixed memory format for Unicode-String communication (#2027) @HS

ⓘ Broadcast search for Ethernet connections is deactivated by default. It can be activated by putting BroadcastSearch=1 into the [General] section of the cclTcpIp.ini (#1947) @HS

✓ Fixed loading of Novalues from XML files (Parameter-Export) (#2051) @HS

☼ Support for Visual Studio 2013 added (#2066) @HS

ⓘ Standalone will throw an error if .NET 3.5 is not installed, at least when using the batches to start (#2089) @HS

☼ The tool BmpColorConverter16.exe has been added to rc_lib\tools. Documentation for this tool see Integration Manual 10.5.2 @WD

8.3   Documentation generation

✓ Statemachines and Signal diagrams are now also exported in designs without HMI (#1881) @HS

✓ Fixed some texts which were not multilingual (#112) @HS

✓ Fixed generation of System information on targets without HMI @HS

ⓘ Selection of showing PC surfaces is disabled if there is no Surface_VIS(0) in System-Module (#1911) @HS

ⓘ Selection of showing Pictdefs and Visualdefs is disabled if there is no Embedded HMI and no Surface_VIS(0) in System-Module. (#1911) @HS

ⓘ In module description moved submodule list up to be first item in Intern section (#1908) @HS

ⓘ Headers for behavior in module documentation only appear for modules with that behavior (#1907) @HS

ⓘ More detailed information on submodules in module documentation (#1972) @HS

☼ Ports are now documented in the module documentation. The previous interface documentation using PUBLIC functions and IN/OUT-elements is removed (#1905) @HS

☼ Print info text of a port in documentation (#1959) @HS

☼ Added HTML-Support and Placeholders to Comments of Module definitions. (#1919) @HS

✓ executeINIT is also called at start of documentation generation @HS

8.4 Editor

8.5 Rad-Library

ⓘ For Modem, a signal visualization of the Modem state has been added. It requires MRoot to be the base class of the System module. Then if RD_USE_MODEM is set, the Surface_CTR(1) of Submodule Modem shows in case of a GSM Modem the Signal strength while communication is offline and in case of an analog or ISDN Modem an antenna symbol while the communication is online. This surface requires a graphical display. @WD

ⓘ✘ The functions in SDCard.rad have been made shorter and faster. The function $GetElemArraySize() which was probably never used outside the module has been removed @WD

ⓘ✘ The Protocol module prot5.rad has been removed. The new and improved module Protocol6.rad shall be used instead. Implementation information can be found inside the File Protocol6.rad as Comment. This already applies to radCASE 4.9 @WD

☼ Ethernet.rad now supports setting of subnet mask and standard gateway (#2005) @HS

ⓘ✘ The DI´s, AI´s and CNT´s are added to the force mode handling. Also the memory for handling force mode of DO´s has moved from ctr_util.c to ctr_init.h and is now dynamically. New functions are: di_force, di_unforce, ai_force, ai_unforce, cnt_force, cnt_unforce. (Rev. 6757) @NV

ⓘ✘ The structure PROT_COMMDATA has been removed from the protocol6.rad. It was not usefully used. But the last parameter ("&ProtCommData[0]") of the protocol-initialization call have to be removed. Example:

```
Old: $Protocol.Init("Prot.dat", (PROT_CONF*)elTab4prot1, &ProtCommData[0]);
New: $Protocol.Init("Prot.dat", (PROT_CONF*)elTab4prot1);
```
@NV

☼ Added a new set of surfaces in tvis_dialogs.rad that matches with QVGA displays. @BS

☼ Added a new set of surfaces in tvis_dialogs.rad that matches with 128x64 monochrome displays. @BS

8.6 API-Interface

ⓘ✚ For Ethernet communication using cclConnectionEth.dll the header of 4 Bytes length of data is removed, so when receiving data there are no first 4 Bytes determining the length of the data to come and if sending data it is not allowed anymore to send the length before the data. @HS

☼ Customizable size of communication buffers for PC visualization. The Define RD_COM_SND_BUFSIZE is used for setting the size of one packet from controller to PC, this define should also be used for any API internal buffers used for sending. The Define RD_COM_RCV_BUFSIZE controls the size of one packet from PC to controller and should be also used for any internal buffer used in API for receiving data. The standard values for those defines match the old static buffer size of 256Byte.
The buffers should not be smaller than 32 Bytes for initial communication of the buffer sizes. (#1896) @HS

✓ The sending of cursor positions is repaired for text displays. To send the cursor positions set the two short-Pointer _cursorPosX and _cursorPosY to a variable containing the cursor positions. @HS

☼✚ Extended RDI usage to use RDIs up to 65534. The index of al RdWrEvtxxx-Functions is now an unsigned short instead of a short. (#1927) @HS

ⓘ Command VCM_SET_OUTPUT in Imacs-Protocol is not supported and therefore function SetOutput in API is not needed if define NO_FORCEMODE is set @WD

ⓘ✚ Some modifications for brickBus implementation. File bBConfigs.h is no longer included in bBDefines.h @WD

ⓘ✚ Because of moving visualizers from source.c to osdl.ini the Define RD_PROPFONT is always generated. If the API uses code dependent on that Define instead of using #ifdef the Define has to be used with #if RD_PROPFONT > 0 (#234) @HS

☼✚ New Ethernet interface. The functions changeIP() and getBoardIP() are now replaced with the function unsigned char execEthCommand(unsigned char command, void * cmdData). (#2005) @HS

ⓘ✚ Regardless the force mode is activated or not, you have to name the API-I/O-functions now with …exe... (yyy_exe_xxx). In addition you have to rename di_test into di_exe_test, ai_read into ai_exe_read and cnt_read into cnt_exe_read. (Rev. 6757) @NV

8.7 Custom Sim

ⓘ✚ Removed the files modhier.cpp and modhier.h (#234) @HS

9 Bugfix Release 4.9.1

9.1 Code generation + runtime library

- ✓ Fixed compile errors for Burst mode (#1973) @HS
- ✓ Fixed crash on using custom About-Box or dynamic version switching message (#1916) @HS
- ✓ Fixed possible errors originating from adding automatically semicolons after some statemachine code objects, which can cause problems with preprocessor directives at the end of those objects (#1923) @HS

9.2 Product framework

9.3 Documentation generation

9.4 Editor

9.5 Rad-Library

9.6 API-Interface

10 Release Version 4.9.0

10.1 Code generation + runtime library

- Persistent Data Handling and EEPROM Interface have been changed completely. See Integration manual for details @WD
- The variable pCommBlock is now instantiated in the RC_lib @WD
- The #define BIN_DATA is no longer needed in MEMORY.DEF @WD
- Corrected defines Param and System in ctr_def.h @WD
- removed files chipcard_text.rad, protokoll.rad, Debug.rad and LIB_A320.rad from RC_lib/LIB. They are nowhere used and their contents is also contained in other files @WD
- Better error detection for ENUM ranges and digits/decimals (#125) @HS
- Corrected Autotest function – still used EEP_mode, which has been removed @WD
- Generation of length of ENUMs into memio.dok corrected (#1763) @HS
- Visualizer VNRotation01 removed, use VIS_ROT visualizers instead (#1763) @HS
- Desktop-Setting BC= removed, use SystemDef->Settings->Background instead (#1114) @HS
- Program generates fatal error at VS compile if settings for persistent storage are missing in MEMORY.DEF @WD
- Persistent Data Handling now supports also Flash. See Integration manual for details @WD
- Usage of data preservation is now more general. The setting will not affect settings EI and RI anymore and will create an own element table into preserveTab.c, with the static name ElemIdxPrsvPntTab[] (#1839) @HS
- New Systemcode-Setting FLASH_ON for support of an external data flash (#1845) @HS
- Corrected Macro RD_GET_OSDL for RD_EXTERNAL_OSDLINI to consider binary alignment correctly @WD
- An error message is thrown for not supported folders @HS
- Changed function c_cur_setPos() to use colors as parameters like c_cur_movePos() @HS
- The copying from Editcopy to Processcopy has been moved from the Persistent thread into the cFuncXXXRestore() function. Thus, the sequence cFuncXXXRestore() – cFuncXXXCopy() will operate as expected and as in most previous versions. @WD
- The EEPROM Handling in sim.cpp now behaves as far as possible identical to the target. This makes Simu testing more reliable. @WD
- Handling for Burst has been improved :
  For Burst initiated by the host, the host must send the command VCM_ENABLE_BURST to the application to start transmission of Bursts and must send the new command VCM_DISABLE_BURST (0x9D) to the application to end transmission of Bursts
  For Burst initiated by the application, the application must call the function startBurstMode() to start transmission of Bursts and must call the function endBurstMode()to end transmission of Bursts. The 2 Burst commands are "ORed", i.e. if either a Burst from the Host or from the application is enabled, the Communication program will send Burst messages. @WD
- When using external osdlini[], the alignment correction is done by the RC_lib. Binary alignment must not be obeyed in function read_osldini() @WD
- Added define "RD_NO_COMM_CHKSUM". If set, the IMACS Protocol Module will not send the Checksum acknowledge (=0xAA) upon reception of a message. This is usefull for TCP/IP or similar underlying protocols which have their own checksum mechanism @WD
- The reserver space for a checksum in remanent data is moved to the end of the remanent data. The Remanent data arrays are now always working with alignments > 1 (#1856) @HS
- The data structures have been modified to work also with precompiled (object) versions @WD

ⓘ Changed the format of Define rC_VERSION to allow for two digit version numbers. The old format was the decimal xyz0 for radCASE x.y.z. Now the new format is the hexadecimal number xxyyzzii for radCASE x.y.z. In the new format the last number is the internal build number of the design compiler. @HS

☼ Added new Define RD_REV_NO containing the Revision number of the used radCASE, which can be used as an alternative to rC_VERSION for checking for a specific radCASE version. @HS

ⓘ The generated tables for Data preservation are now included in ctr_init.h instead of ctr_persist.c. This is necessary if ctr_persist is part of the precompiled library @WD

☼ New global variable unsigned char RDexitSurInterpreter to be able to abort surface interpreter (clean exit of application) @HS

☼✖ Integrated call for c_touch_calib() into SysInit function, since this function is related to the persistent storage setup functions in SysInit. Therefore it is not required to implement calls to c_touch_calib() into the API any more, neither in case calib is forced by touching the screen nor in case calib is required due to corrupted calibration data @WD

ⓘ✖ Moved function RD_updateDateTime into SysPerm, so it does not need to be called from usercode.c anymore. To ensure this, the functions RD_updateDateTime() and RD_saveDateTime() were renamed to RD_updateSysDateTime() and RD_saveSysDateTime() @HS

✓ Corrected extended rectangle drawing function. It did not work properly on certain 16bit controllers. @WD

✓ Fixed possible errors originating from adding automatically semicolons after some code objects, which can cause problems with preprocessor directives at the end of those objects (#1863) @HS

ⓘ✖ EEPROM error messages now will use the do_error() function on targets without display, instead of resetting the EEPROM without a message. To get the old behavior the Ctr-Setting EM=0 has to be set (#1864) @HS

ⓘ Added function pointer RDfp_extRect for customizing extended rectangle functionality @HS

✓ⓘ Fixed some corner radii and overall made some optical enhancements @HS

ⓘ Better error detection for wrong C-data types for IO Elements, at warning level 3 (#1865) @HS

☼ Added files to support boardBUS on target. The file boardBUS_master.c and bB_IOIntf.c must be included in the targets makefile (or equivalent toolchain) to add boardBUS support. An include file according boardBUSConfigs_template.h must be integratet into the target specific section. To enable boarBUS support, the #define USE_BOARDBUS must be set.

ⓘ Added check for specified foreground and background color of embedded HMI. (#1866) @HS

ⓘ Dongle search optimized for faster start of design compiler @HS

✓✖ The Macro GET_DEF has been replaced by the macro GET_DEFX. Several consequential corrections had to been taken. The old macro could fail in case of external osdlini @WD

ⓘ Enhanced error detection for errors in memory segmentation of EEPROM @HS

✓ fixed Bug in execution of Actions after OPEN of a Surface_CTR @WD

ⓘ Removed unnecessary Defines MEM_IO and MEM_HDO (#1867) @HS

ⓘ Removed obsolete Define MODUL_PROT from generation @HS

✓ Fixed generation of elements in module array into preserveTab.c @HS

✓ Fixed usage of RD_CONST for data preservation @HS

✓ Fixed crash on accessing an Element within a module array within a not existing module (@HS)

ⓘ Invoking Touch Calibration can be prohibited by the new define RD_NO_TOUCH_CALIB. The Touch data in the Persistent storage remains unchanged even if corrupted in this case. @WD

ⓘ 　act-Pointer of elements are always created in element structure instead of NULL pointers. CTR-Setting CEA=1 now only enables additional code in rc_lib (@HS)

✓ 　Fixed crash on empty element names in different actions. (#1963) @HS

10.2 Product framework

☼✖ 　The handling of the Visual Studio versions for the simulation project has been simplified.

If you did not modify anything in the subdirectory "sim" of your project, you have a "default simulation project". If you did make modifications to your simulation project (e.g. by adding files in Simulation un-der Visual studio), you have a "custom simulation project".

In case of a "**default simulation project**":

Simply delete the entire subdirectory "sim". It will be automatically created / updated from the rc_lib, taking into account the Visual Studio version which is selected via the environment variable MSVC_BIN. This allows changing the Visual Studio version for a project very easily: You only have to set MSVC_BIN to the desired VS version.

In case of a "**custom simulation project**" - !! CAUTION !!

Since the contents of the subdirectory "sim" will always be copied from the rc_lib, your changes will be overwritten and get lost !

To avoid this, you have retain an *empty* subdirectory "sim" and then create a directory "CustomProj" inside the sim-directory containing all files customized by you.

The files in this directory will be taken instead of the default files copied from the rc_lib.

NOTE:

On subsequent radCASE updates you may have to adapt your custom files. Required changes will be listed in the new chapter "Custom Sim".

☼ 　New context menu items to reset values of simulation elements and IOs in simulation (#1828) @HS

ⓘ 　Added LOCAL and EVA-elements and resorted the ModulView (#1829,#1830) @HS

✓ 　Fixed wrong error localization in global code of Statemachines and Activity charts (#1825) @HS

✓ 　Fixed wrong error localization for missing semicolon at end of global code in Methods, Statemachines and Activity charts (#1825) @HS

ⓘ 　Changed drawing of extended rectangle to use new interface, for a better performance when using Desktop-Setting DTD=1 @HS

☼ 　Support for Visual Studio 2012 added @HS

ⓘ 　MSVC_BIN environment variable is not needed anymore. radCASE will search automatically for the newest supported Visual Studio version and copy the according project. For CustomProj the Visual Studio version will automatically be selected according to the project files. When it is required to force a specific Visual Studio version use the CustomProj to do so. @HS

☼✖ 　Added a tuned ethernet connection DLL for TCP/IP-communication ("`cclTcpIpV2.dll`") between PC and target (svn-revision 3359).

If you want to use it, you have to define RD_NO_COMM_CHKSUM in your project and copy the DLL to your common\release|debug-folder or you can define the DLL in the SystemDef→Settings→Timing-field as "CD=cclTcpIpV2.dll" in your .rad-system file.

The differences to the old TCP/IP-DLL are that the timeout for receiving single bytes during target-answer is increased and the checksum-receiving from target is removed.

It´s because of the usual implementation of TCP/IP-stacks, that there is a mechanism for collecting data (with timeout) before sending out on ethernet media.

Hint: The communication between serial interface ("cclSerial.dll") and TCP/IP-ethernet-connections is also different in one point: Every block sent from PC to target is extended by

leading length information of all following bytes. This 4 byte number is in Intel- or little endian-format.

In reverse the sending from target to PC should still not implement this additional length information.

If you want to know what version of (cclConnection-)DLL you have, you can look at the version information with the windows explorer checking the file properties (→Details). It should have a version number > "2,0,0,0". @NV

- ✓ Fixed possible crash on bad timing when drawing extended rectangles @HS
- ⓘ Persistent Data Management now tries to write back Default values in case Management data cannot be read. Thus an E101 communication error will be reported in case Device cannot be written instead of a list of read errors. @WD
- ⓘ Changed project settings to disable warnings in object version (missing debug information) @HS
- ⓘ Dongle search optimized for faster start of Product framework (only for licenses without VSF-Packet) @HS
- ✓ Some additional required DLLs are now copied to DLL to prevent errors on some rare systems where those are not installed @HS

10.3 Documentation generation

10.4 Editor

10.5 Rad-Library

- ☼ Added diagnosis dialogs and functions in tvis_dialogs.rad @BS
- ☼ Added calibration dialogs and functions in tvis_dialogs.rad @BS
- ✓ Added missing picture in tvis_dialogs.rad @BS
- ✓ some changes in sd-card.rad: defines "DISPLINES>7" has been replaced by "DISP_128x64" or "DISP_122x32". FontSize -1 has been changed by FontSize 8 in the design. @BS
- ✓ Fixed cursor for password dialogs in tvis_dialogs.rad @HS
- ⓘ New media module to support writing a protocol to a Linux system has been added to Protocol6.rad @BS
- ☼✖ Added functions in SD-Card.rad to convert PAR, SYS and PROC into separated csv files @BS
- ✓ Some bug fixes in SD-Card.rad concerning PAR2CSV @BS
- ⓘ Added support for ELEMENT-Arrays in SD-Card.rad @BS
- ⓘ Deleted memory allocation in tvis_dialogs.rad concerning calibration dialogs. @BS
- ☼ Added support to convert binary protocol file into csv file in SD-Card.rad @BS
- ☼✖ Added function to get a complete protocol line to process with prot2csv() in SD-Card.rad @BS
- ⓘ tvis_dialogs.rad: buffer to edit values can be changed to another variable than RD_Global_wstr1. See project node for more information's. @BS

10.6 API-Interface

- The variable pCommBlock is now instantiated in the RC_lib and has to be removed from API @WD
- The variable screen was moved to rc_lib so the variable and initialization has to be removed from API. @WD
- Persistent Data Handling and EEPROM Interface have been changed completely. See Integration manual for details @WD
- c_key_scan() removed. The function is not needed in any API anymore, if it is not needed internally @HS
- c_dis_pixel() removed. The function is not needed in any API anymore, if it is not needed internally @HS
- short c_key_sim(void) was merged with void c_key_put(void). Now only c_key_put() is used. Eventually if c_key_put() was not implemented c_key_sim() has to be renamed to c_key_put(). @HS
- New functions for extended rectangles were added, to be able to make initializations before and finishings after drawing of extended rectangle:
  void c_dis_initPixelOutput(M_D_SCR short x, short y, short sizex, short sizey);
  void c_dis_finishPixelOutput(M_D_SCR_S);
  @HS
- c_cur_set() prototype changed to match prototype of c_cur_move():
  void c_cur_set(M_D_SCR short, short M_D_COL M_D_COLBK);
  @HS
- c_dis_arc() prototype changed to contain all necessary information to draw an arc:
  c_dis_arc(M_D_SCR short sx, short sy, short radx, short rady, short startangle, short endangle, short pensize M_D_COL);
  @HS

10.7 Custom Sim

- Include of ErrorHandling.cpp removed and ErrorHandling.cpp renamed to ErrHandling.cpp, which has to be added as source file in the custom project
- Header references in Sim-Project cleaned up
- New source file added: ctr_persist.c containing new EEPROM handling
- For Visual Studio 2010 projects added command line parameter /validate_manifest to Manifesttool, to prevent error on creating from command line.
- Changed project settings to disable warnings in object version (missing debug information)
  The following settings are changed:
  Removed StdAfx.cpp from project
  Debugging database format changed to /Z7
  Added preprocessor definition _CRT_SECURE_NO_WARNINGS
  Disabled precompiled headers
  Added current directory (".") to include path
  @HS
- Fixed object creation with projects using ctr_db.c. Added ctr_db.obj into linking for sys.lib and sysd.lib in the post build event. @HS

11 Bugfix Release 4.8.7

11.1 Code generation + runtime library

- Fixed crash in module pointer projects with more than 5000 elements within indistinct modules. For module pointers the Bit 0x80 of elType is used to detect if the current element is accessed using offsets. So if using elType to identify the element type of an element within a module pointer project the elType has to be masked with 0x7F.
  For elements in rdi_pnttab.c the additional flag isoffset in the RD_IDX_PNT_TAB structure can be used to determine if the element is accessed as offset. (#2182, #2189) @HS

11.2 Product framework

11.3 Documentation generation

11.4 Editor

11.5 Rad-Library

11.6 API-Interface

12 Bugfix Release 4.8.6

12.1 Code generation + runtime library

- ✓ Fixed possible crash for nested module pointers (#2068) @HS
- ✓ Fixed crash in simulation of module pointer projects (#2182) @HS
- ✓ Fixed crash in module pointer projects with more than 5000 elements within indistinct modules. For module pointers the Bit 0x80 of elType is used to detect if the current element is accessed using offsets. So if using elType to identify the element type of an element within a module pointer project the elType has to be masked with 0x7F. (#2182) @HS

12.2 Product framework

- ⓘ Increased maximum number of communicated elements to 25 000 (#2047) @HS

12.3 Documentation generation

12.4 Editor

12.5 Rad-Library

12.6 API-Interface

13 Bugfix Release 4.8.5

13.1 Code generation + runtime library

✓ Fixed errors in combination with conditional surfaces and VisLine/VisRot and VisRotXY visualizers (#2021) @HS

13.2 Product framework

✓ Fixed memory format for Unicode-String communication (#2027) @HS

13.3 Documentation generation

13.4 Editor

13.5 Rad-Library

13.6 API-Interface

14 Bugfix Release 4.8.4

14.1 Code generation + runtime library

✓ Fixed access to visualizers in module pointers for 32-Bit processors and simulation (#1969) @HS

14.2 Product framework

14.3 Documentation generation

14.4 Editor

14.5 Rad-Library

14.6 API-Interface

14 Bugfix Release 4.8.4

15 Bugfix Release 4.8.3

15.1 Code generation + runtime library

✓   Fixed linker error when RD_NO_TIMEDATE is set without setting RD_NO_STDEDIT (#1877) @HS

15.2 Product framework

15.3 Documentation generation

15.4 Editor

15.5 Rad-Library

15.6 API-Interface

16 Bugfix Release 4.8.2

16.1 Code generation + runtime library

- ✓ Fixed Standard value of IOs and SV,HV,LV,HA,LA with § (#1796) @HS
- ⓘ Allowed § in Typedefs and Assignstrings (for logical values) (#1796) @HS
- ✓ Fixed Puts for ENUMs with § (#1796) @HS
- ✓ Fixed background restoration as used color in menus in combination with element visualizers in the menu (#1844) @HS
- ✓ Fixed an error with inheritance when mixing C-functions and ST functions (#1702) @HS
- ✓ Fixed alignment calculation for Strings in project with UTF8 (#1851) @HS
- ✓ Fixed a crash which could occur in combination with extended graphic when changing a surface with GOTOSURFACE within an AEnter. (#1857) @HS
- ⓘ Fixed and changed RD_strtok function to work like any other strtok function; especially if it is called more than one times. @BS
- ✓ Fixed crash during design compilation for not existing element referred to by an element visualizer within a full. @HS
- ✓ Removed error of wrong calibration data version for projects without calibration data (#1860) @HS
- ✓ Modified timeout for copy batches to wait 2:30 min instead of 20 seconds (#1861) @HS
- ✓ Corrected positioning of extended rectangles for negative size (#1862) @HS
- ⓘ Automatically disable display communication for display types not supported in communication (to enable display communication in APIs that use supported and unsupported displays). @HS

16.2 Product framework

- ✓ Fixed Standard value of IOs and SV,HV,LV,HA,LA with § (#1796) @HS
- ✓ Fixed Puts for ENUMs with § (#1796) @HS
- ✓ Fixed an alignment problem in the calculation of size of the parameter data resulting in error messages of wrong parameter size (#1855) @HS
- ✓ Fixed out of display error on small displays when changing to playback mode and back to simulation @HS
- ✓ Fixed an issue were a not activated language could be selected by using a wrong standard language (#1854) @HS
- ✓ Fixed overflow of EBINs for Decrement in Surface_VIS (#1775) @HS

16.3 Documentation generation

16.4 Editor

16.5 Rad-Library

ⓘ   Added initialization of FTransEnabled to prevent crashes for Setting TE=1 and no initialization in usercode.c @HS

16.6 API-Interface

17 Bugfix Release 4.8.1

17.1 Code generation + runtime library

- ✓ Fixed a bug when accessing a module array within a multiple instantiation from a single instanced module (#1827) @HS
- ✓ Fixed error with SetPos, where needed structures were not exported for Elements behind a SetPos (#1823) @HS
- ✓ Fixed error with SetPos, where needed structures were not exported for Elements used within a SetPos (#1833) @HS

17.2 Product framework

- ✓ Fixed a license issue where the license of a standalone could not be read in special circumstances resulting in an error message of a corrupted license file (#1837) @HS
- ✓ Fixed relative positioning after Lines (using start position of line instead of end position (#753) @HS
- ✓ Fixed positioning of scale and description for bar visualizers in Surface_Vis (#1790) @HS
- ✓ Fixed display of Selection text of VisBinIcons on Surface_VIS after change of value (#1792) @HS

17.3 Documentation generation

- ✓ Fixed crash with big images as border images for target display and texts near the end of the display (#1834) @HS

17.4 Editor

17.5 Rad-Library

17.6 API-Interface

17.7 Known severe bugs

- ☒ Symptom: When using a generic template to create a new project and using a Statemachine the Simulation will crash.
  Reason: The generic templates are configured to use the variable fTransEnabled within Statemachines, but this variable is only initialized to NULL, resulting in a NULL-Pointer exception, when the Statemachine tries to use this variable.
  Fix: There are two possible fixes for this:
  1. Add the Desktop-Setting TE=0, to disable the usage of that variable

2. Initialize the variable fTransEnabled to point to an element in the design. E.g. add the following code into the function UserInit() in the usercode.c:

    FTransEnabled = &(Flag->TransitEnabled);

    After this you can use that Element to start and stop processing of state machines in your code.

18 Release Version 4.8.0

18.1 Code generation + runtime library

ⓘ　Optimized performance of drawing extended rectangles @HS

ⓘ　Element names starting with Stat_ or OldStat_ are now catched as reserved names (#1682) @HS

☼　The RdnComm.c supports now the new protocol version 6 communication for transfer data to the visualization. It will be automatically used, if you have the Protocol 6 library ("protocol6.rad") in your design. (➜"#define PROTOCOL_VERSION 6") @NV

✓　C datatype long is exported as LONG into struct.lst instead of sometimes FLOAT. Also floats are exported as FLOAT and doubles as DOUBLE (#1683, #1684) @HS

ⓘ　Pictures used in runtime library are not exported always but are moved to a surface in std_system.rad to be able to remove pictures from export. If not exported the pictures are no longer causing compiler errors (#1706) @HS

ⓘ　Further optimization of performance of drawing extended rectangles @HS

ⓘ�खPerformance of extended rectangles further enhanced. For this a change of specification in API was made. See API-Interface @HS

☼खNesting of module pointers supported. Global variable G_Procdata which should contain the pointer to the data of the current module is replaced by global array G_Procpnt and global index G_CurPntDepth. G_Procpnt should contain a pointer to the pointer structure of the currently active module pointer and also of the above ones and G_Procpnt contains the current depth. (#1679) @HS

ⓘ　Controller-ID can now be set in EntityTab (#1679) @HS

✓　pntmerge-Tool also works correct for mirrored pntTab (#1679) @HS

☼　New cursor type 0x800 for user definable Scrollbars. If activated the pointer RDfp_drawUserScrollBar can be set to a function of prototype
void func(M_D_SCR CVisMenuBegin RD_MROM *thisvis, short itemCount);
The function will be called to draw the scrollbar. The Parameter thisvis is a Pointer to the menu, so using that pointer information on the menu can be determined to draw the scrollbar, the itemCount is the total number of visible items in the menu. (#1714) @HS

☼　New cursor type 6 for user definable cursor. If activated the pointer RDfp_updateUserCursor can be set to a function of prototype
void func(M_D_SCR CVisMenuBegin RD_MROM *thisvis);
The function will be called to change the highlighted item in the menu. The function has also to delete the old highlighting. The Parameter thisvis is a Pointer to the menu, so using that pointer information on the menu can be determined to draw the new cursor and delete the old one. (#1714) @HS

ⓘ　Added additional information to memio.dok (#1720) @HS

ⓘ　Bitmap paths now support environment variables (#1725) @HS

✓　Fixed export error into struct.lst caused by changes of memio.dok (#1720) @HS

ⓘख IOs, CNT and Timer will be initialized to Standard value of element (Formatstring SV=) instead of starting with 0. (#1393) @HS

✓　Fixed error on exiting surface after changing index within module pointers (#1679) @HS

ⓘख The handling for osdlini, osdlbmp and/or osdltxt on an external device has been enhanced and unified. Use the following defines to enable these features :

RD_EXTERNAL_OSDLINI	If defined, osdlini[] is on external device

RD_EXTERNAL_OSDLTXT	If defined, osdltxt[] is on external device
RD_EXTERNAL_OSDLBMP	If defined, osdlbmp[] is on external device
RD_READ_OSDLINI	Macro encapsulating function to access osdlini[]
RD_READ_OSDLTXT	Macro encapsulating function to access osdltxt[]
RD_READ_OSDLBMP	Macro encapsulating function to access osdlbmp[]
RD_EXTERNAL_OSDLINI_BUFSIZE	Read buffer size for RD_READ_OSDLINI, default : 10
RD_EXTERNAL_OSDLBMP_BUFSIZE	Read buffer size for RD_READ_OSDLBMP, default : DispSizeX * BitsPerPixel/ 8

The RD_READ_OSDLXXX macros expand to a function of the following format :
short ReadExternalXxx(unsigned long from, unsigned char * pDstBuf, unsigned short length), which will return 0 (or a positive value) if everything is ok and a value <0 in case of failiure.
The previous defines READ_OSDLTEXT and GET_BMP_PTR are no longer supported. @WD

✓ Fixed error in detection of CANopen elements (false design compiler error) caused by changes of memio.dok (#1720) @HS

ⓘ AOs and DOs can be used as input in a signal diagram now. Also a connection between two elements, which can be used as input and output can now be established (#1729) @HS

✓ In some cases of using AOs or DOs as input in a signal diagram, the generated code was wrong (#1729) @HS

ⓘ✖ Several pointers around the data stored in EEPROM have been redefined :

Variable	Ancient	Now
GParam	RD_CONST void RD_MRAM *GParam;	RD_CONST PARAM RD_MRAM *GParam;
GParamEd	RD_CONST void RD_MRAM *GParamEd	RD_CONST PARAM RD_MRAM *GParamEd
Param	PARAM *Param	Removed, use GParam instead
GProc	RD_CONST void RD_MRAM *GProc;	RD_CONST RD_PROC RD_MRAM *GProc;
GSystem	RD_CONST void RD_MRAM *GSystem	RD_CONST SYSTEM RD_MRAM *GSystem
GSystemEd	RD_CONST void RD_MRAM *GSystemEd	RD_CONST SYSTEM RD_MRAM *GSystemEd
System	SYSTEM *System	Removed, use GSystem instead
GKali	RD_CONST void RD_MRAM *GKali	RD_CONST EEP_Kali RD_MRAM *GKali
GKaliEd	RD_CONST void RD_MRAM *GKaliEd	RD_CONST EEP_Kali RD_MRAM *GKaliEd
kali	EEP_Kali *kali	Removed, use GKali instead

The Macros PARORG, SYSTEMORG and EEP_KALI_INIT shall not be used in Designs, use GParam, GSystem and GKali instead. @WD

ⓘ✖ Removed the file syscode.h. It was not needed and contained many duplicates of other files. To access persistent data, use the global pointers instead of address operators.

- ⓘ✖ For VIS_ROT the rotating image does not need to be square anymore. The background image is now used as area to restore so it has to be big enough to cover all the area the rotating visualizer can be. The background image has to be at least an invisible rectangle of according size (#1735) @HS
- ⓘ✖ VIS_ROT_XY now supports up to 5 rotating and moving visualizers in one element. For the visualize now there has to be a list of pictures that can be moved and rotated and for each picture there need to be 3 elements in the MElem. The movement range MR= has to be specified as semicolon separated list of x and y values, which are comma separated, so e.g.: MR=X1,Y1;X2,Y2;X3,Y3;… The same syntax is needed for the rotation range RR=Rmin1,Rmax1;Rmin2,Rmax2;…. (#1552) @HS
- ✓ Fixed parsing error of format item BK= for MElems resulting in changes from #1552 (#1740) @HS
- ⓘ The use of element par_align_corr in PARAM and RD_PROC structures has been removed in the RC_lib. Variable GParamAlignCorr has also been removed (#1577 – partly) @WD
- ✓ Fixed license check for INT-package (#1719) @HS
- ⓘ✖ The Define RD_VALUE_PRESERVE is generated automatically according to Desktop-Setting DP=. The Setting DP= is now currently not working. (#1043) @HS
- ⓘ The data preservation files are only generated according to the bitmask set in DP= (#1042) @HS
- ⓘ Throw error message for double defined languages (e.g. UK and EN defined) (#1728) @HS
- ✓ Fixed crash for unknown assign types (#1767) @HS
- ⓘ The defines DO_IS_FORCED and DO_REAL_STAT have been removed from ctr_io.h, since they belong to solely to a function which has been removed. @WD
- ⓘ✖ The Defines "OPT_PROTOKOLL" and "MODUL_PROT" have been removed from the RC_lib. Use "PROTOCOL" and "PROTOCOL_VERSION" instead. For How to use, see Comments in files prot5.rad and protocol6.rad @WD
- ✓ Fixed communication with Product framework for big endian processors (#1794) @HS
- ⓘ New Systemcode setting ETHERNET_ON to activate/deactivate Ethernet-Support (#1812) @HS
- ⓘ Error message is thrown if using calibration for an ELEMENT in a project with deactivated calibration (#1817) @HS
- ✓ Fixed ELSEIF in Sequence diagrams (#1782) @HS
- ✓ Fixed copying of files with umlauts for generation of standalone (#1818) @HS
- ☼ MODUL arrays are now supported within multiple instances or other MODUL arrays (#1063) @HS
- ✓ Fixed some Defines for feature deactivation (#1800,1801,1803,1804,1807,1808,1809) @HS
- ✓ Fixed some code of simulation which was not disabled using Define ___CTR___ but instead by detecting compilation as C++-Code. (#1819) @HS
- ✓✖ Defines OK and ERROR are renamed to RD_OK and RD_ERROR to prevent collisions with compiler defines. (#1820) @HS
- ✓ Fixed offset in variable pool for MElems in a Full (#1821) @HS
- ⓘ Removed calls to API functions do_exe_force() and do_exe_unforce(). These were always implemented as empty functions and therefore useless. @WD

18.2 Product framework

- ⓘ Reinserted Windows menu. It can be added as menu uid 369. Note this is a whole menu, were only the names of the contents can be modified. The items and order cannot be modified. The order is: Cascade, Tile horizontal, Tile vertical. After this the open windows are shown. (#1670) @HS

✓ For communication the new format of struct.lst is used to interpret LONG as long and FLOAT only as float and DOUBLE as double (#1683, #1684) @HS

☼ Values of elements with assign type LOCAL is also saved in database (#1378) @HS

✓ Fixed crash in protocol download caused by changes for #1683, #1684 (#1684) @HS

✓ Removed TaskView (#1689) @HS

ⓘ Time limit plugin interface will be called for every online change for visualization or every start of simulation instead of once on Product framework start (#1710) @HS

ⓘ Resetting the simulation will also set all IOs, CNTs and Timer to standard value of element (#1393) @HS

✓ Fixed exceeding time limit on start of visualization without plugin (#1710) @HS

✓ Fixed a graphical error in simulation API functions c_dis_save/restore_area() used for Line and Rot-visualizers (#1737) @HS

ⓘ✖ In Single Step mode, all simulation tasks will now run sequential (in order Inter-Task, Perm-Task, Sur-Interpreter-Task) instead of parallel. Please make the pause in do_perm() function in usercode.c only if variable simPauseMode is 0 instead of <2. (#1727) @HS

☼✖ visual.lic is now automatically created during design compilation. Because this file now has to match the project, ensure the file is not write protected. For version dynamic switching the visual.lic has also to be put into the config directory following the same naming convention as for modul.xml and struct.lst (#1719) @HS

✓ Communication of variables from Simulation to Visualization does work correct again for single step mode (#1741) @HS

✓ Fixed bug in c_dis_bitmap1_rot() – used only with ext. Grafics @WD

✓ Fixed communication with target for big endian processors (#1794) @HS

18.3 Documentation generation

ⓘ Border picture for embedded HMIs is exported in 24Bit per pixel (#1692) @HS

☼ CANopen elements are documented (#1716) @HS

✓ Fixed crash in documentation generation caused by changes for IO initialization, in special cases of INIT functions. (#1393) @HS

18.4 Editor

✓ Now changes on .rad-file-attributes will (again) be detected and the file can be reloaded.

✓ Drag&drop of elements doesn´t append a digit at the end anymore.

ⓘ Tooltips are shown on modules which deriving from others

ⓘ A rectangle now shows the selected color in the choosing color dialog

ⓘ Added checkbox named "using" next to "network license"

ⓘ Hierarchical close in tree view - single expand - now only with (mouse click and) pressed WIN-key.

✓ Pict->Bitmaps of *.png-type now working also with the x-/y-size details, like *.bmp already do before.

✓ Transition in state machines are displayed now with the old position style.

ⓘ Changed view size of packet diagram to 10000 pixel and added zoom dependency.

ⓘ Fixed/improved copy->paste element-rename mechanism.

ⓘ The 'paket rectangles' in the paket diagram have now colours for normal (white), protected (pink) and read only (cyan) files.

ⓘ Changing to another document in the editor now leads to an internal update of data (id´s, if-endif,...).

ⓘ   Added the 'colour' BACKGRND to menu visualizers.

ⓘ   Added auto filling for ComType if the user changes the AssignType
=> add "V1" if RTC,SEMA,MAILBOX,EVENT,STAT,OUTEVT,INEVT,OUT,IN,FLAG
=> delete ComType for all other AssignTypes

☼   If a user copies (Ctrl+C) in the tree view, now the folder of the file and a (text-)path to the selected radCase element will be copied in the clipboard.

ⓘ   If pressing CTRL down in the signal chart, while repositioning end of connections, radEdit will not try to reconnect to an SigIcon or SigElem => repositioning will be successful.

ⓘ   VIS_ROT_XY has now a RotImg-List and not only one RotImg-field.

✓   SigIcons show the description-text of the submodule and not the ID.

✓   SigIcons with elements now show the last derived element description.

✓   Elements will be inserted in a Signal Chart on the position of the mouse (again).

ⓘ   Support for new hasp license implemented.

ⓘ   Added new radCase element 'REPLACE' in the SystemDef-section.
If an entry 'REPLACE NNN DDD' is inserted there, then all radCase/XML-attributes (like the value/content of 'AssignType', 'ID' or 'Position X' and all the other values) of the complete project (with libraries) will be tested with the data content NNN, and if it´s equal, then the content is replaced with the data DDD.
This only happens after the start of a design compilation (during data export) and will not change any existing data or .rad-file.
‼️ Be careful with the definition of NNN, because everything that is equal to NNN will be replaced by DDD ‼️ Example: "REPLACE 'DO' 'Crash'" ➔ All 'DO'-AssignTypes will be replaced and exported with 'Crash'.

ⓘ   The 'AssignType'-attribute in 'ELEMENT' can now be typed in/edited free by the user – for example: "MyPrivateType" can be defined as an AssignType.
This only make sense, if the user also defines a 'REPLACE'-entry in the SystemDef-section (see new feature above) – otherwise an error will produced. For example "REPLACE 'MyPrivateType' 'DO'".

✓   The grid, in a surface view, will now correctly be drawn, no matter what y scroll position is selected with the scroll bar.

✓   In an empty or new selected signal chart, now only elements of the signal module will be shown in choice dialog of the 'Use existing element'-function.

18.5 Rad-Library

☼   Create and add a draft version of a model-library for **building automation** under \LIB\building_auto.rad" and a correspondent subdirectory for bitmaps. Also insert a sample area in the Reference-Projekt at location: ..\Repos\radCASE\Develop\Designs\OSDL\Reference_lib.rad: ModulDef.MODUL:MBuilding) @AF

✓   Fixed touch diagnosis screen in hmi_touch.rad to also show last clicked coordinate, if API function sets coordinate to clicked after setting raw-value to 0 @HS

☼   Modem has additional Surface for graphical representation of signals strength for GSM Modem, currently only for Display 128*64 @WD

☼   New protocol processing module in protocol6.rad. This protocol allows multiple instances with data on different or same media (i.e. memory, sd card).
To use it, you have to instantiate a submodule "Protocol" of type MProtocolSDC or MProtocolMem.
Also you have to define in the settings a "#define PROTOCOL 1" and a display resolution like "DISP_QVGA". To initialize the protocol module call "$Protocol.Init(RD_char* name,

PROT_CONF* ElemTab, PROT_COMMDATA* pcd);"

name := Protocol-/filename

ElemTab := Table of elements created from the designcompiler, with data of elements, which should be recorded: ("P1"=>elTab4prot1, "P2"=>elTab4prot2,...)

pcd := Internal structure for pc protocol communication: ➔ "&ProtCommData[0]" for protocol 1, ➔ "&ProtCommData[1]" for protocol 2, if exisiting, and so on.

Example:

```
$Protocol.Init(TXT("Prot1.dat"), (PROT_CONF*)elTab4prot1, ProtCommData[0]);
```

If you use the memory protocol, you have to call also `$Protocol.Media.SetMemory(ProtocolMemoryAddress, ProtocolMemorySize);`

It is necessary to implement 2 wrapper functions for every protocol:

  long ProtocolGetNumRecords(void){return $Protocol.GetNumRecords();}

  long ProtocolRead(long index, unsigned char* data){   return $Protocol.Read(index, data);}

Because these two functions have to be written into the pc protocol communication structure:

ProtCommData[0].ProtRead = ProtocolRead;

ProtCommData[0].ProtGetNumRecords = ProtocolGetNumRecords;

Then check, if your target has a protocol task, which calls the executePROT()-function. If not create a task or call from a perm-function. @NV

- ✓ On displaying multiselective EBINs the string output stops on terminating 0-Byte now. @HS
- ✓ Removed invalid font size -1 from surfaces for smaller displays in std_system.rad @HS
- ✓ Signal library (sig_analog.rad) - Limiter functions: Corrected definition of Min and Max (elements were defined as OUT and thus now settable) (#1701) @MG
- ⓘ Added standard pictures for runtime library to Surface_Ctr(999) of MRoot in std_system.rad. This surface can be overwritten to prevent some or all of the pictures to be exported (#1706) @HS
- ☼✖ System Overview menu (Surface_CTR(50) in MRoot) now supports Firmware Update if #define FW_UPDATE is set to 1. In this case an additional Surface_CTR(51) is invoked, therefore derived Modules must not use this Surface Number. The API must support a function called void FirmwareUpdateStart(void), which is currently implemented in the NXP3 API. The Firmware Update screen is at present only implemented for HMI Displays 128*32 or larger. @WD

18.6 API-Interface

- ⓘ✖ Performance of extended rectangles enhanced. For this the prototype of function:
  inline void c_dis_incPrintPixel(M_D_SCR unsigned char r, unsigned char g, unsigned char b);
  was changed to:
  inline void c_dis_incPrintPixel**s**(M_D_SCR unsigned char r, unsigned char g, unsigned char b, **short count**);
  The function now should print out multiple pixels in the provided color starting at the global position. Count is the number of pixels with the same color. This should mainly increase the performance for targets that don't make the function inline. @HS
- ☼ System Overview menu (Surface_CTR(50) in MRoot) now supports Firmware Update if #define FW_UPDATE is set to 1. The API must in this case support a function called void FirmwareUpdateStart(void), which is currently implemented in the NXP3 API. @WD
- ⓘ✖ The handling for osdlini, osdlbmp and/or osdltxt on an external device has been enhanced and unified. Use the following defines to enable these features :

RD_EXTERNAL_OSDLINI	If defined, osdlini[] is on external device
RD_EXTERNAL_OSDLTXT	If defined, osdltxt[] is on external device
RD_EXTERNAL_OSDLBMP	If defined, osdlbmp[] is on external device
RD_READ_OSDLINI	Macro encapsulating function to access osdlini[]
RD_READ_OSDLTXT	Macro encapsulating function to access osdltxt[]
RD_READ_OSDLBMP	Macro encapsulating function to access osdlbmp[]
RD_EXTERNAL_OSDLINI_BUFSIZE	Read buffer size for RD_READ_OSDLINI, default : 10
RD_EXTERNAL_OSDLBMP_BUFSIZE	Read buffer size for RD_READ_OSDLBMP, default : DispSizeX * BitsPerPixel/ 8

The RD_READ_OSDLXXX macros must expand to a function of the following format :
short ReadExternalXxx(unsigned long from, unsigned char * pDstBuf, unsigned short length),
which will return 0 (or a positive value) if everything is ok and a value <0 in case of failiure.
The previous defines READ_OSDLTEXT and GET_BMP_PTR are no longer supported.

For RD_EXTERNAL_OSDLTXT, the following function is also required :
RD_char RD_MRAM *getHMIText(unsigned long offset)
This function returns a pointer to the text in offset.

For RD_EXTERNAL_OSDLBMP, the functions c_dis_bitmap(),c_dis_getBitmapSize() and c_dis_bitmap_rot() must be replaced by the functions c_dis_bitmap_ext(),c_dis_getBitmapSize_ext() and c_dis_bitmap_rot_ext(). These functions have "long offset" instead of "unsigned char * bitmap" as parameter. @WD
The angle of c_dis_bitmap_rot() will now be passed as positive value => clockwise rotation in degree * 1000. (#1735) @HS

18.7 Known severe bugs

Symptom: When using a generic template to create a new project and using a Statemachine the Simulation will crash.
Reason: The generic templates are configured to use the variable fTransEnabled within Statemachines, but this variable is only initialized to NULL, resulting in a NULL-Pointer exception, when the Statemachine tries to use this variable.
Fix: There are two possible fixes for this:
3. Add the Desktop-Setting TE=0, to disable the usage of that variable
4. Initialize the variable fTransEnabled to point to an element in the design. E.g. add the following code into the function UserInit() in the usercode.c:
    FTransEnabled = &(Flag->TransitEnabled);
    After this you can use that Element to start and stop processing of state machines in your code.

19 Bugfix Release 4.7.1

19.1 Code generation + runtime library

- ✓ Fixed export of needed pictures for standalone into standalone_prj_picts.bat (#1673) @HS
- ✓ Design compiler now correctly detects frozen batches (#1691) @HS
- ✓ Freezing of design compiler for recursive submachines fixed (#1699) @HS
- ✓ Missing initial state in unitstates now throws error (#1698) @HS
- ✓ Fixed crash in connection with assign type MSG (#1712) @HS
- ✓ Fixed precompiler condition for RD_NO_CTR_REF @HS
- ✓ Fixed wrong design compiler error for special cases of inheritance in connection with PDO-elements (#1730) @HS
- ✓ Fixed bug in Calibration AO : Calibration was not usable for more than 4 display lines and less than 4 function keys @WD
- ✓ License error messages are in language of editor instead of documentation language (#1743) @HS
- ✓ Common crash fixed for projects with defined energy group and submodule of a not existing module definition (#1747) @HS
- ✓ Fixed crash for unknown assign types (#1767) @HS
- ✓ Fixed an error in finding submachines in case of multiple StateCharts in one MODUL (#1772) @HS
- ✓ Removed pointless warning and corrected code generation for ActionProcs in multiple instances with $-Syntax generating better code (#1781) @HS
- ✓ Fixed wrong touch evaluation for multiple nested FULLs (#1778) @HS
- ✓ Fixed rotating bitmaps and area restoration within FULLs (#1779) @HS
- ✓ Fixed assign type INEVT/OUTEVT functions and C data type recognition (#1813) @HS
- ✓ Allow $-Access for every Element-Access in the radCASE-model (#1814) @HS
- ✓ Fixed crash in formatting System parameter data with KEY_SETUP on targets with Touch (#1811) @HS
- ✓ Projects with activated setting HT=1 are now compilable for setting ST=0 (#1816) @HS

19.2 Product framework

- ✓ Fixed memory leak when switching from Visualization to Simulation and exiting program in Simulation mode (#1693) @HS
- ✓ Start-/End dialog shows text again (#1306) @HS
- ✓ Corrected saving of timestamps for getting protocol data (#1695) @HS
- ✓ Fixed deadlock on ending visualization on encountering time limit of plugin (#1697) @HS
- ✓ When moving whole project including setting files to another system from a system with special multi monitor setup the connection panel could get out of display. This is now fixed (#1704) @HS
- ⓘ On start Product framework ensures all windows are visible (#1681) @HS
- ✓ Title bars of child windows are correctly updated when changing language (#1711) @HS
- ✓ Fixed graphical error in Signal diagrams for connections with a length of 0 (#1733) @HS
- ✓ Never before opened windows are opened in correct size to prevent scroll bars (#1739) @HS
- ✓ Synchronized recording mode doesn't deactivate itself on ending of recording (#1742) @HS
- ✓ Fixed action PUT on SURFACE_VIS for ENUMs, to correctly evaluate decimal places. (#1774) @HS

- ✓ ActionCopy fixed for copying of NoValues (ENUM and EBIN) (#1789) @HS
- ✓ Fixed display of radio buttons, list sorted in correct order (#1791) @HS
- ✓ AEnter in SURFACE_VIS is also called in System Module (if not Surface 0) (#1773) @HS

19.3 Documentation generation

- ✓ Big Surface_VIS are now exported completely (#1732) @HS

19.4 Editor

19.5 Rad-Library

19.6 API-Interface

20 Release Version 4.7.0

20.1 Code generation + runtime library

- Added support for extended rectangles. To use an extended rectangle use a rectangle and select fill mode Extended. Then there are different parameters to modify the look of those rectangles. (#1524) @HS

- Extended rectangles now check for display bounds to not draw out of screen and catch some crashes caused by this. (#1524) @HS

- In GetActCTRLanguage the calling convention for _putMask and _moveMask Macros was changed from "unsigned long *" to "unsigned long RD_MRAM *" and also the variables used have accordingly been modified. This change is requirted for C166 targets, where RD_MRAM contains the memory model definition (far, huge, tiny etc) @WD

- Compiler errors fixed for CTR-Setting UU=1 (#625) @HS

- Lines, Rects and Picts are now supported within Menus (#1540) @HS

- Colors and font size are now supported for AMenus, VisElems and Texts. Because Texts already had fields for size and color, but did ignore those settings the behavior of texts in a menu could change. Also the behavior of an element visualize in a menu could change, because it already had fields for selecting the color which was previously ignored.
  The color fields in VisElems and Texts have standard values of COL and COLBK normally inserted by the editor, so menus with differing colors should be checked in particular. (#1540) @HS

- Two line menus are now supported by moving the value with field "pos act val" below the description. This also works for VisBinIcons. (#1320) @HS

- Menus support selecting of colors for current selection (#1540) @HS

- Relative positioning on Surface_CTR can be made depending on element values, using SetPos (#1551) @HS

- SMS support has been redesigned. Modules in smslib.rad are completely new. Now it is possible either to send a free formulated SMS or to send an SMS on every alarm. @WD

- Fixed linker error for DISP_TEXT in new menu implementation (#1559) @HS

- Added support for VIS_ROT_XY visualizer. To use it an MELEM has to be used, with option MR=x,y for movement range in pixels and RR=l,u for lower and upper rotation range. The MELEM has to have 3 elements, the first for movement on X-axis, the second for movement on Y-axis and the third for rotation. (#1552) @HS

- Fixed display error on VIS_LINE visualizers, that caused the moving part of a vertical visualizer to be positioned false. (#1552) @HS

- Negative values for size of VIS_LINE allowed. The negative values will result in a inverted movement. So for low values of the element the movement will be the largest possible movement. (#1552) @HS

- $DM and $DS is now replaced correctly in AMenus. Did not work after changes from #1540 (#1562) @HS

- Extended rectangles are positioned correctly, if the vertical size of the rectangle is positive (meaning drawing the rectangle top down) (#1524) @HS

- For colors of AMenus and selected lines standard values can be selected again, by choosing "-" as color, if the Editor supports this. (#1555) @HS

- Design compiler does not crash anymore when encountering recursive Fulls (#1539) @HS

- Removed various warnings thrown by very strict compilers in runtime system and generated code (#1509, #1283, #1564) @HS

- Catch error if element has more selections than the VisBinIcon pictures during design compile instead of during runtime. (#356) @HS

- ⓘ Error format for general errors changed, so editor will not throw error on trying to show source of the general error in design (#619) @HS
- ✓ Standard colors for arrow cursor in menu corrected if there are additional options (like scrollbar) (#1540) @HS
- ✓ Arrow cursor correctly initialized when drawing menu. Fixed a problem with \c Text in opened surface. (#578) @HS
- ✓ Menu doesn't select unselectable icons, if jumping from one end of the menu to the other. (#1289) @HS
- ✓ Fixed compiler error for subnode arrays caused by change for removing warnings (#1567) @HS
- ☼ Added cursor type 5 to menus. This type is like cursor type 4 a whole line inverting cursor, but redraws all not selectable icons after the selected menu line, allowing drawing of pictures and other graphical items in the same line to be highlighted by the cursor. (#1570) @HS
- ☼ PNG support added for targets. When using this, see also changes in API-Interface (#39) @HS
- ✓ Casting added for negative values in switch-case (needed for some processors) (#1573) @HS
- ✓ Saving of menu positions fixed in connection with conditional surfaces (#388) @HS
- ✓ For very fast communication some commands were lost, because of delayed resetting of communication. (#1579) @HS
- ⓘ Removed some not needed dummy data at the end of PAR and PROC structure for an alignment of 4 with specific structure length (#1563) @HS
- ⓘ Removed desktop setting CD=1, DLL communication is now used by standard. (#159) @HS
- ☼ New command line option /LANG=<language> (e.g. /LANG=GR). This will override the language set in the editor and use the passed language as language for error messages. (#1560) @HS
- ✓ Removed double call of comp_des_post.bat (#1590) @HS
- ⓘ Modem support has been enhanced @WD
- ✓ Extended rectangles: Color gradient is corrected for big values of gradient (near 100%) (#1524) @HS
- ✓ Extended rectangles: Standard value for gradient is corrected (#1524) @HS
- ☼ New MElem visualizer VMNBar1 to draw a bar visualizer in dependency on multiple elements. The number of elements has to be even, because every partial bar in the graph depends on two elements one specifying the start point and one the end point. The following options are available for this visualizer:

  SV=x,y: specifying the size of the whole bar

  DI=h/v: specifying the direction of the bar

  BK=<color>: specifying the background color for the graph (rectangle with size SV)

  CT=<color>,<color>,…: specifying a list of colors one for every element pair, so for 6 elements 3 colors have to be specified. The specified color of an element pair is the color for that partial graph (#1600) @HS
- ⓘ Remanent data can also be set to defaults in Setup-routine (#1592) @HS
- ✓ Fixed offset calculation for global module structures (created for indistinct modules) (#1611) @HS
- ☼ For targets with a complete keyboard the selection of a menu line can be done by pressing the first letter of that menu line (#1617) @HS
- ✓ Corrected function prototypes for RD_EXTGRA functions to use in APIs @HS
- ✓ Fixed crash of design compiler in connection with /LANG command line option (#1616) @HS
- ✓ Fixed crash of design compiler if display type is missing (#1614) @HS
- ⓘ Design compiler throws error for recursive Icons in Surface_Vis, which prevents crashes of the simulation. (#1613) @HS

- ✓ Fixed crash for Fulls to not existing modules (#1615) @HS
- ✓ Fixed touch functionality for menus with cursor type 5 (support for multiple menu entries in the same line) (#1619) @HS
- ☼ Added support for HASP dongles (#787) @HS
- ✓ Fixed crash for enable masks of elements (#1625) @HS
- ⓘ Selecting of menu lines by pressing beginning letter also works in direct edit mode (#1617) @HS
- ⓘ Support for HASP dongles enhanced to multiple allowed dongles for one license (e.g. license server and additional local single licenses) (#787) @HS
- ✓ Fixed wrong generated module structure for overwritten submodules (#1636) @HS
- ✓ Fixed crash for Full in Full in another module for extended graphic support (#1637) @HS
- ✓ Fixed crash for pointer sizes > 2 in osdl.txt (#1651) @HS
- ☼ New function RD_getSystemDayOfWeek(unsigned long date) to get the day of the week (starting with 0 for Sunday) for the date provided (date in format YYYYMMDD) @WD
- ⓘ✖ Changed formula for color gradient of extended rectangles. Now the color of the rectangle is in the middle and the gradient will darken the color in one direction and lighten up the color in the other direction. Also the value for the gradient is more sensible because the brightness of the color is calculated to be a value between 0 and 200 and the value for the gradient is added on one side and subtracted on the other. This results in a dark grey (RGB-Values of 127) to have a gradient from black to white for a gradient value of 100. (#1657) @HS
- ⓘ✖ Size of Display Background Buffer is now defined generic in RDnComm.h as
  `#define DISPMEM_SIZE ((DispSizeX * DispSizeY * BITSPERPIXEL) / 8 )`
  Thus absolute definitions in usercode.h or elsewhere shall be removed. Background Buffer is not required if either NO_EMB_HMI or RD_NO_DISPLAYCOMM are set. @WD
- ✓ Fixed export of Defines for texts for texts used in Base modules (#1671) @HS
- ✓ Fixed graphical error for negative size of VMNBar1 on Surface_CTR (#1600) @HS
- ☼ Added new command line option /CHECKVERS for checking from command line if common and rc_lib are matching. Environ.def has to be created for this option to work. (#1633) @HS
- ✓ Fixed enabling/disabling of items in menus with new cursor type 5 (#1570) @HS
- ⓘ Using of VisBinIcons with fewer options than the element will not cause an error message within Signal-Icons anymore. (#1663) @HS
- ⓘ Scrollbar of menus now only reserves space for clickable arrows when Define TOUCH_ON is set. @HS
- ⓘ When setting a #define RD_REVERSE_EBIN_TOGGLE the toggle direction of a EBin element will be reversed, which means UP will show the next EB_ENTRY @AL
- ⓘ✖ Target Debug support has been removed from RC_lib. This feature is not used anymore and therefore obsolete. Removing it frees space in RAM and EEPROM @WD
- ⓘ✖ The EEPROM ranges defined as "EEPSYS" and "EEPUSER" in MEMORY.DEF have been removed from the RC_lib. These areas shall not be defined in the Design (MEMORY.DEF) anymore. @WD
- ✖ Function "clearCounter()" in syscode.c has been optimized and renamed to clearTimerCounter().
- ⓘ Support for reading license information directly from dongle instead of a file (only HASP dongle) (#1665) @HS
- ☼ New Defines RDRGBCOL, RDRGBCOLBK and RDRGBCOLTRANS are exported, containing the RGB-Values of global foreground, background and transparency color of target, for use in API. The values are in 0RGB 8888 Format (#1687) @HS
- ✓ Fixed bug in Edit menu for multiselective EBins (length was determined erroneous) @WD
- ✓ Bugfix (missing "break") in RdnComm.c for application specific Command @WD
- ⓘ Added support for Xmodus AL3094S Modem, testet only for Communication, not for SMS @WD

- ✓ A Bug in the communication has been fixed. Setting EStr Params from remote did not work @WD
- ⓘ For GSM-Modems, the signal strength is also requested and stored in the `RDN_PROT_IFACE` structure @WD

20.2 Product framework

- ⓘ Simulation equations are stopped for elements that are stimulated by sequences (#1514) @HS
- ☼ When shutting down the product framework the parameters are saved binary into file params.bin into DEVELOP-directory. If Desktop-setting SE=1 is set the system parameters are also saved into system.bin. (#1515) @HS
- ✓ If Desktop-Setting SE=1 is set, system parameters are also saved to XML-file when saving parameter data. However in special cases the loading of that generated XML-file resulted in system parameters not being loaded. (#1538) @HS
- ✓ Extended rectangles are now always displayed (fixed some error in update routine for extended rectangles) (#1524) @HS
- ✓ Fixed an internal communication error in connection with simulation equations of multiple digital IOs on the same port (#1545) @HS
- ⓘ Reinserted support for Visual Studio 2005 (#1549) @HS
- ✓ Fixed positioning error for rectangles with negative horizontal size on Surface_Vis (#1524) @HS
- ☼ Added support for extended rectangles on Surface_Vis (#1524) @HS
- ✓ Changes relevant to bDisableAero Style for Windows 7 are taken for the use case of Vista OS. @NS
- ✓ First iteration for fixing problem of possible Ribbon bar disappears under Windows 7 and Vista operation systems. @NS
- ✓ Crash on "Gen All"-Cancel is fixed (#1557) @NS
- ⓘ✖ Added button with uid 417 to select filenames for binary parameter(system parameter) data and save that data. Saving this data on closing of simulation is deleted. To create this data the Product framework configuration has to be adapted to support this uid and the according button has to be clicked for creating the files. (#1568) @HS
- ✓ Languages selection (on start Standalone version with vis.bat) is again accessible (#1569) @NS
- ✓ Position of Arcs on Surface_Vis corrected (#1578) @HS
- ⓘ A minimum size of the application and the child windows is ensured (#1586) @HS
- ⓘ To support GSM modems a parameter in cclConnection.dll is added. By setting tResponse=x in cclSerial.ini in [General] section the timeout behavior can be changed. The value x is a value in milliseconds specifying the time the communication will wait as a maximum until a timeout occurs. Changing this value is only recommended for really slow connections. (#1553) @NV
- ☼ To support a GSM connection the communication data can be further reduced for an established modem connection.

    The following reducing can be done by setting the according value into the [Modem] section of the config.in (in Develop directory):

    - Disable communication of display data with setting ComDisplay=0

    - Disable communication of different IOs with setting IOEnable=0x<mask>.

    0 means all IOs are disabled, the following Bits enable the following IOs:

            0x01: DOs enabled

            0x02: DIs enabled

0x04: AOs enabled

0x08 AIs enabled

0x10 CNTs enabled

0x20 TIMs enabled

- Disable communication of different Flags. For this the Flags have to be assigned different Communication types V1-V9 in the design. After this it is selectable which of these Flags will be communicated, with setting VEnabe=0x<mask>.

0 again means 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

…

For an established modem 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 in reduced mode only the items that should be communicated according to previous settings are communicated. To switch between reduced and normal mode a Checkbox or Button with UID 418 has to be added to the product framework. Where the activated setting means reduced communication. (#1553) @HS

ⓘ   Message for non matching struct.lst and modul.xml only shown once instead of for each element (#1077) @HS

ⓘ   Translated some languages from language selection dialog to according language all others to English (#872) @HS

☼   New command line option /LANG=<language> (e.g. /LANG=GR). This will override the language last used in product framework and start the framework with passed language. (#1560) @HS

ⓘ   Color BACKGRND is also supported for rectangles in Simulation, which can be used for VisBinIcons (#1596) @HS

✓   Extended rectangles: Color gradient is corrected for big values of gradient (near 100%) (#1524) @HS

☼   New MElem visualizer VMNBar1 to draw a bar visualizer in dependency on multiple elements. The number of elements has to be even, because every partial bar in the graph depends on two elements one specifying the start point and one the end point. The following options are available for this visualizer:

SV=x,y: specifying the size of the whole bar

DI=h/v: specifying the direction of the bar

BK=<color>: specifying the background color for the graph (rectangle with size SV)

CT=<color>,<color>,…: specifying a list of colors one for every element pair, so for 6 elements 3 colors have to be specified. The specified color of an element pair is the color for that partial graph (#1600) @HS

✓   Fixed a display error for clear rectangles, that were not always drawn on the screen (e.g. background of VNBar1) (#1600) @HS

ⓘ   The reduced communication (#1553) is now available for all communications (instead of only for modem). The settings are moved from section [Modem] to [Communication]. When establishing a modem connection there is always the reduced communication enabled.

There are also some new settings that can be set in the config.ini in the [Communication] setting:

StartReduced=1: The visualization will be started with a reduced communication and every time the visualization goes offline the reduced communication is enabled again. For no entry or =0 always the full communication is enabled in these cases.

DataRate=n: The data communication is slowed down. The data will be polled every n-th communication cycle.

DisplayRate=n: The display communication is slowed down. The display data will be fetched every n-th communication cycle. (#1599) @HS

✓ Inherited elements also get displayed in energy view (#1321) @HS

✓ Simulation does not crash anymore for System module without any surface (#1626) @HS

✓ Touch coordinates are only sent to controller for clicks into communicated display (#1556) @HS

✓ Standalone again running without CBitmaps (#1622) @HS

ⓘ Status bar improved. Now it is clearly visible if in Simulation or Visualization mode (#1607) @HS

ⓘ✖ Changed formula for color gradient of extended rectangles. Now the color of the rectangle is in the middle and the gradient will darken the color in one direction and lighten up the color in the other direction. Also the value for the gradient is more sensible because the brightness of the color is calculated to be a value between 0 and 200 and the value for the gradient is added on one side and subtracted on the other. This results in a dark grey (RGB-Values of 127) to have a gradient from black to white for a gradient value of 100. (#1657) @HS

ⓘ✖ New features in Product Framework configurator resulting in format change for XML-file:

- Attribute "name_uid" is removed and can't be used anymore
- Within tag <item> the <name>-tag or attribute "name" is needed for the text
- Within tag <item> another <item> tag is allowed to create nested menus
- New node <Mainmenu> for configuring the main menu (round button).
- attribute "main_button" is moved from tag <Categories> to <Mainmenu>
- New node <Mainmenu> is like a menu button, so it can contain different <item> tags
- Additional to items the <Mainmenu> can contain an <exitbutton> tag for the exit button below the menu
- New tag <tooltip> with same syntax like <name> for adding tooltips to items. Can be used for <Mainmenu>, <exitbutton>, <Element>, <item>
- New tag <keytip> with attributes "ribelem" and "popupmenu" for quick access keytips. Can be used on <Mainmenu> (only "popupmenu"), <Category> (only "ribelem"), <Element>, <item>. Attention: Keytips of Elements and items only work if parent Category/Mainmenu has a keytip.
- Menus doesn't have a uid for the menu anymore, but instead for each entry. See default configuration for uids of menu entrys.

(#1652) @HS

ⓘ✖ Some bugfixes with view windows resulting in further format change for XML file of Prouct-Framework configurator:

- ClassView renamed to ModuleTreeView
- FileView and according uid 133 removed
- Attribute view_ctrl removed (not needed anymore)

The visible attribute for views now only affect the first start, for all others the last status will be restored. Because of this the checkboxes are not disabled even for invisible views. (#1631) @HS

☼ Output window can now be used from simulation over interface function void RDLogMessage(wstring windowname, wstring text);

In windowname the tabname for output should be specified, the tab is created if no tab with that name exists.

Text will contain the text to be outputted in the according view. (#1631, #1166) @HS

✓ Active state is now correctly highlighted for statemachines with many unitstates. (#1052) @HS

- ⓘ Added support for 32x32 pixel icons (#1627) @HS
- ✓ Enhanced some issues with non resizable windows (Close button now completely visible in XP and half visible in Win7) and maximizing/minimizing windows (#1662, #1581) @HS
- ⓘ Display error message when starting ASCII-export or sequence export without recorded data (#1661) @HS
- ⓘ Standalone generation now automatically copies all project specific pictures (#1673) @HS
- ✓ Fixed issues with non resizable windows for Win7 (#1662) @HS
- ✓ Fixed passthrough of keyboard input to Surface_CTR, accidentally damaged by changes to dockable windows (#1631) @HS
- ✓ Fixed generation of simulation for Visual Studio 2010 on some special 64Bit architectures (#1632) @HS
- ✓ Fixed crash on changing password level (#1680) @HS
- ✓ Keys F1, F6 are not passed two times from keyboard to controller (#1685) @HS
- ✓ Parameters are saved correctly for every file created by automatic saving (#1686) @HS
- ✓ Fixed loading of license file for simulation when license file for design compilation is loaded from a HASP dongle (#1665) @HS
- ✓ Fixed flickering of VIS_ROT and VIS_LINE for fast changing values. (#975) @HS
- ☼ New command line parameter /PW=<password> to start simulation directly with password level of entered password. This is useful for the standalone version (#60) @HS
- ⓘ Introduced new global #define RD_NO_SYSPARUPDATE. If this #define is set, RdnComm does not permit to change SYSPARs from the Visualization Surface. @WD

20.3 Documentation generation

- ✓✗ Because of a memory consumption optimization for the osdl.ini, the usage of DT_ENTRYs does not work correct for setting variable values during documentation generation. To solve this issue the optimization can be disabled with CTR-setting DOO (Disable Osdl.ini optimization). (#1537) @HS
- ✓ Some memory leaks fixed (#1537) @HS
- ✓ Conditions were not correctly processed if the surface used a Full which had an AKEY (#1537) @HS
- ✓ Fixed crash for Visual Studio 2010 (#1549) @HS
- ☼ New command line option /LANG=<language> (e.g. /LANG=GR). Note the old syntax will override this new setting. So if using e.g. /EXPHTML=UK /LANG=GR english will be the language used for documentation. So the new alternative to writing /EXPHTML=UK is /EXPHTML /LANG=UK (#1560) @HS
- ✓ Menu stretch with more than 500 pixels doesn't result in crash anymore (#1597) @HS
- ✓ Fixed export of text of TouchKeys into documentation (#1598) @HS
- ☼ Added new documentation field to element documentation (#1612) @HS
- ⓘ Added more information to Typedefs, PictDefs and VisualDefs exported into documentation (#1622) @HS
- ✓ Fixed crash for documentation of extended rectangles @HS
- ✓ Fixed debug assertion in documentation generation (#1677) @HS
- ⓘ Replaced X-Placeholders for Date and Time with value of the according elements in generated target displays (#1677) @HS

20.4 Editor

- ⓘ Extended attributes and some new behavior for VIS Objects are implemented. (#1522, #1527, #1528, #1535, #1536, #1532) @NS
- ✓ Overwritten Elements a not shown in ITable. @NS
- ⓘ Extended Rectangle Presentation is added @NS
- ✓ Switching on Code View Problem is fixed for procedures and functions @NS
- ✓ Memory leak in Class diagram is fixed @NS
- ✓ Update Doc generation button procedure is corrected @NS
- ✓ The preprocessing procedure started in regime -E returns positive error number and writes the error description in error0.txt (#1561) @IS.
- ⓘ If a .rad-file is included but is not found, radEDIT searches for a .radp-file with the same name and in the same path. If such a radp-file is found, it will be taken instead of the included .rad-file. (#1604) @NV
- ☼ New command line option for converting file into protected format.
  'radEdit.exe -P filename.rad' → will create a protected .radp-file 'filename.radp' (#1604) @NV
- ☼ Implemented support for HASP keys. @NV
- ☼ End customer license (option G) supported (#1604) @MG
- ✓ The license server (v1.9.0.0) frees up a network license after some minutes timeout, if the network is disconnected (#1414) @NV
- ⓘ✗ Modify the colors >= 16 of the 256 color table. Now they are more sorted, usefull, modern. @AF

20.5 Rad-Library

- ⓘ Removed warnings thrown by strict compiler in hmi_touch.rad and tvis_dialogs.rad (#1564) @HS
- ⓘ✗ Removed AlarmManager.rad from Library. This file, for longer time not maintained in RC_lib, is replaced by AlarmManager.rad in the radLib @WD
- ✓ Fixed missing saving of IP in one surface of ethernet.rad (#1606) @HS
- ✓ Delete cursor after closing edit dialogs from tvis_dialogs.rad, to prevent graphical errors when calling edit dialogs from surfaces >10000 (no c_dis_clr()) @HS
- ⓘ✗ Added support for selection masks of multiselective EBins into tvis_dialogs.rad. If using derived modules the function call to initMEbinDialog() has to be changed accordingly. For information on the new syntax please look into the information of the function in the .rad file. (#1674) @HS
- ⓘ when setting a #define RD_REVERSE_EBIN_TOGGLE the toggle direction of a EBin element will be reversed, which means UP will show the next EB_ENTRY. Changed the file tvis_dialogs.rad @AL
- ⓘ✗ SMS support has been redesigned. Modules in smslib.rad are completely new. Now it is possible either to send a free formulated SMS or to send an SMS on every alarm. @WD
- ⓘ In Surface_VIS of Root, Version Numbers and Time and Date are not editable any more – does not make use to change these in Visu @WD
- ☼ Root Module now additionally has Day of the Week of the System Time as Flag Element. @WD
- ⓘ In SystemInfo Menu, Selection of "Sound" is only visible when RD_NO_BEEP is not set. Selection of "Unit Conversion" is only visible when RD_UNITCONVERT is set. @WD

20.6 API-Interface

ⓘ   Added support for Communication Modules in RC_lib. Introduced new global #define RD_COMMODUL to be used as follows :
RD_COMMODUL = 0 (or omitted) := no communication Module
RD_COMMODUL = 1 := old COM Module
RD_COMMODUL = 2 := new Socket Communication Module
Please note that for proper operation the API must support the selected Communication Module type. RD_COMMODUL is also used in Standard API implementations. @WD

✓   ErrorHandler does not freeze for GCC if error file begins with a new line (#1534) @HS

ⓘ✘   Communication can now handle multiple ports without influence from one to another (except SMS – SMS is only available for 1 Port). This requires Code modification in case function startBurstMode() is used. startBurstMode() now requires the Interface for the Burst as additional parameter. Several changes have also been made to the SMS functions, see source code for details, and structure `RDN_PROT_IFACE` has been modified, but this is only relevant if function `Setup_Empty_RDN_PROT_IFACE()` is not used to initiate the structure.

ⓘ✘   Communication is prepared to handle different Modem types. Type of Modem must be set in element Medium of structure `RDN_PROT_IFACE` @WD

☀   If the new feature of extended rectangles is used (Define RD_EXTENDEDRECT is set) the following three API functions have to be implemented:
inline long c_dis_getRGBColor(M_D_SCR_S M_D_COL); // Before bugfix
inline long c_dis_getRGBColor(M_D_SCRCOL_S);
inline void c_dis_setNextPixelPos(M_D_SCR short x, short y);
inline void c_dis_incPrintPixel(M_D_SCR unsigned char r, unsigned char g, unsigned char b);

c_dis_getRGBColor() will get an color index of a 256 color table and should return the according RGB-value as long in format 0x00RRGGBB;
c_dis_setNextPixelPos() should set a pointer/global variable to the passed position to make the next pixel output on that position.
c_dis_incPrintPixel() should print a pixel at the last set position with the passed rgb-values and increase the pointer so the next position is one pixel to the right.
(#1524) @HS

✓   Fixed compiler error on target for specification of extended rectangle function. New prototype:
inline long c_dis_getRGBColor(M_D_SCRCOL_S);
(#1524) @HS

ⓘ✘   File ImacsProt.c was splitted into 3 files : ImacsProt.c, sms.c, sms_mobil.c. ImacsProt.c now does no more contain the functions for sms support. These are in sms.c (for sms support via a provider) and sms_mobil.c (for sms support via direct line, e.g. a GMS modem). Accordingly. The meaning of the #define RD_USE_SMS has been modified :
RD_USE_SMS = 1 enables sms support via a provider
RD_USE_SMS = 2 enables sms support via direct line
RD_USE_SMS = 3 enables both options.
Makefile and RD_USE_SMS definition must therefore be changed if SMS support is used. @WD

☀✘   PNG-Support added. The PNG-data has a different header format than bitmaps. Header format for PNG is:
Byte 0-4: Size of PNG-data
Byte 5: Bitmap type: Bit 2 set if PNG
Byte 6-…: PNG-data

For c_dis_bmp routine first Bit 2 of Byte 5 should be checked, if it is a PNG and the API should act accordingly. The PNG-data is the whole PNG including magic number. So regular PNG libraries can be used to display the PNG. (#39) @HS

On the end of SysInit(), the non-remanent Counters are cleared (as up to now) and for the remanent counters the physical value is converted into the logical value. This program assumes, that at the end of SysInit() the remanent values are already updated, which generally is the case since this is done in eep_init(). API's with a different sequence shall be adopted if remanent counters are used. @WD

The EEPROM ranges defined as "EEPSYS" and "EEPUSER" in MEMORY.DEF have been removed from the RC_lib. Usage of those Defines should be removed from the API @WD

New Defines RDRGBCOL, RDRGBCOLBK and RDRGBCOLTRANS are exported, containing the RGB-Values of global foreground, background and transparency color of target, for use in API (especially in connection with new tool ColTabConverter.exe to generate color table). The values are in 0RGB 8888 Format (#1687) @HS

RC_lib/tools/Fonts directory has been modified : the *fnt files are not longer recorded, since these are generated files. T.bat and bin2c.bat have been modified to create 3 different font tables for each font : fxxx.c for ASCII, fxxxU.c for Unicode and newly fxxZ.c containing only the fonts for char 0..ox39 to represent Numbers only. This is suitable if large fonts are only used to display numbers. @WD

21 Develop Subversion 4.6.2

21.1 Code generation + runtime library

- Pointer to IOs is generated correctly into rdi_pnttab.c (#1477) @HS
- Burst-elements are not added to RDI-Tabs anymore. Use ComType A if some of the burst elements have to be added to those tabs (e.g. rdi_pnttab.c) (#1477) @HS
- fixed maskable EBin for more than 32 selections. Definition of _moveMask has changed: void do_moveMask(unsigned long a[RD_SELMAXSIZE], unsigned long *b[RD_SELMAXSIZE]) – The second Param is now a pointer. @WD
- Data recording and usage inside of MELEMS now supported for EVA-elements (#1318) @HS
- Exported arrays for CTR-Setting ETA=1 as static RD_CONST (#1482) @HS
- In RdnComm.c, VCM_EXEC_CFUNC is disabled in case of no EMB-HMI, since cFunc() is then not available. @WD
- Added additional casts in ImacsProt.c to avoid Warnings with certain Compilers. @WD
- Corrected passed parameters for Circles (#1491) @HS
- Fixed an error with wrong text reference, if a subtext was exported before the according main text (#1488) @HS
- Removed processor specific defines for access to binary data. For detailed information see entry in _21.6_ _API-Interface_ (#1493) @HS
- Compile error repaired for RD_EXTERNAL_OSDLINI (#1493) @HS
- RdnComm.c compiling failed if #define RD_NO_EDIT_COPY was set. This has been fixed @WD
- Fixed „general error occured during XML-parsing" if Pictures not existing in VisBinIcon (#1480) @HS
- Removed some possible buffer overflows. Especially for initializing values of element arrays, where the buffer overflow already occurred. (#1089) @HS
- Crash caused by last bugfix fixed (#1089) @HS
- For signal connections between signal icons with flat generation there is a temporary variable created into the generated code. In some cases of wrong order of the signal connections that variable is used before it gets a value. In this case now an error message is thrown instead of creating wrong code. (#1286) @HS
- Fixed menu scrollbar for displays with 8 lines or less. (#1474) @HS
- Warning for missing description of EB_ENTRY only appears for used languages and also mentions the language the description is missing. (#1510) @HS
- New warning if standard language is wrong: Format is e.g. SL=UK (#1510) @HS
- Substit.exe replaced by ssr.exe, because of incompatibilities with Windows 7 64-Bit. For backwards compatibility added a substit.bat that converts the old calling syntax to the new calling syntax. (#1504) @HS
- Added newline at end of file to elimate PIC-Compiler warnings. @AL
- Correction for setting of #define RD_NO_TIMEDATE. @AL

21.2 Product framework

- Recording of datasets with connected hardware fixed (#1475) @HS
- Crash after State Machines Views closing is fixed (1478). @NS
- Crash on Signal Charts Views is fixed (1479) @NS
- Life Time data (Plugins) are also configurable (Configurator component) @NS

✓ Visualization functionality bitmap24 is adapted to all display sizes @NS

☼ Configuration of Product Framework is implemented. (#1490) @NS

ⓘ Standalone bat-s are adapted @NS

✓ Removed correction of wrong parameters in simulation API, because now the correct parameters are passed (#1491) @HS

✓ Reconfiguration CRT Libraries in Release and Debug Folders because of network CRT problems (#1492) @NS

ⓘ Configurator and Product Framework Configuration are extended for multi-languages maintenance (#1503). @NS

ⓘ Update configurator component according to Standalone CUSTOM-use-case. @NS

✓ Window commands are fixed, also selection for more than 9 windows is added (#1506) @NS

☼✖ Added support for Visual Studio 2010, VS2008 is still standard. All previous versions are not supported anymore and projects using them should migrate to VS2008 or VS2010. (#1406) @HS

Followup: In 4.6.3 the support for Visual Studio 2005 is reinserted.

ⓘ Send Touch Key Coordinates is implemented in Connection dll. @NS

✓ Fixed rectangle around EBin-Text-Visualizers. Error was caused by #1089 (#1511) @HS

✓ Windows captions for Windows7 are fixed. Additionally the Windows Version is proved to use Disable Aero only in case of Widows 7 because XP has no problems with this style. (#1416) @NS

ⓘ Standalone also shows version information of radCASE (at least by using command line option /SHOWVERS) (#1512) @HS

✓ Simulation Display appearance without set Focus on Common start in standalone version is fixed. @NS

✖ Standalone requires the .NET Framework 3.5 including all updates to be installed.
Note:
XP and Vista do not have .NET Framework installation by default.
Windows 7 contains the .NET Framework (4.0) by default within the Windows 7 installation. The .NET framework 3.5 must additionally be installed (#1513) @MG

21.3 Documentation generation

✓✖ Fixed crash in documentation generation in Debug version. If no manual changes were made in the Simulation project please replace the simulation directory with the one in rc_lib/soft/. If manual changes were made in the simulation project please make sure you have the following settings: Multithreaded-DLL/Multithreaded-Debug-DLL and Embed Manifest = no (#1380) @HS

ⓘ No new design compilation needed, if changing the documentation language. (#920) @HS

21.4 Editor

ⓘ Multiplicity is shown in class diagram (#1423) @NS

ⓘ Do not show objects from signal diagram was implemented (#1424) @NS

ⓘ Show Details (methods and attributes) for object diagram is implemented (#1418) @NS

✓ Tolerance area in state machine diagram is decreased @NS

ⓘ Left and right mouse functionality in Object diagram is adapted to radEDIT Standard @NS

ⓘ Left and right mouse functionality in Class diagram is adapted to radEDIT Standard. @NS

ⓘ State machine – Context menu content and functionality is extended to LeftView Context menu @NS

(i) Class Diagram View – Connection creation/deleting menu content and functionality is completely implemented @NS

21.5 Rad-Library

✓ Fixed some libraries for 8-Bit color, because they exported 24-Bit bitmaps. @AL

✓ SD-Card functionality now also available and functional for systems with no embedded HMI. @AL

(i) Touch coordinates in touch calibration can be overwritten by overwriting function getReqPoints() in module MTouch. (#1355) @HS

✓ Corrected typing error in std_front.rad @HS

21.6 API-Interface

✓✗ The Y-coordinate for function calls of function c_dis_circ() is now corrected. So the Y-coordinate is now a negative value like in every other graphical function. (#1491) @HS

(i)✗ For access to the different binary datas there were different defines to switch code for specific processors. Instead of those defines there are now Macros for replacing the standard code. For redefining the standard code now the following macros can be used:

The macro **GET_TXT_PTR**(offset) was changed to GET_TXT_PTR(offset, accesstype), where accesstype=0 means access of the offsets and accesstype=1 means access to the texts. This distinction is necessary for some processors. The macro still is used for access of the data
The macro can also call a function (e.g. in usercode.c), for this the macro has to be defined as:
#define GET_TXT_PTR(offset, accesstype) get_ptr2(offset, accesstype)
The function definition is:
void RD_MBIN *get_ptr2(unsigned long index, unsigned char accesstype);

The macro **GET_BMP_PTR**(offset) is used for accessing the data of osdl.bmp. It is only used for targets with graphical display (define ___CTR___ and DISP_GRA set).
The macro can also call a function (e.g. in usercode.c), for this the macro has to be defined as:
#define GET_BMP_PTR(offset) getbmp(offset)
The function definition is:
void RD_MROM *getbmp(long index);

The macro **GET_DEF**(index) is used for accessing the visualization definitions in osdl.ini. It is only used if the Define NO_EMB_ATTR is not set. Attention this macro can not be overwritten if the Define RD_EXTERNAL_OSDLINI is set.
The macro can also call a function (e.g. in usercode.c), for this the macro has to be defined as:
#define GET_DEF(index) getdef(index)
The function definition is:
void RD_MBIN *getdef(XPTR index);

The macro **PTR_2_ADR**(ptr) is used in some debug functionality to display the address of a pointer and should convert the pointer into a long. This macro is only used on targets without

display and systemtexts (Defines NO_EMB_HMI and NO_SYSTXT set) if the Define
___DEBUG___ is set.
The macro can also call a function (e.g. in usercode.c), for this the macro has to be defined
as:
#define PTR_2_ADR(ptr) ptr2adr(ptr)
The function definition is:
long ptr2adr(void RD_MBIN *ptr);

For existing APIs that use the old Defines for switching code with processor specific Defines
the following changes have to be made for the following defines to get the previous behavior:

FUJITSU16B
The define has to be removed for all APIs that are not for Fujitsu-processors

TASKING166_01
The following defines have to be set:
#define GET_TXT_PTR(offset, textaccess) (void RD_MBIN *)(osdltxt + offset)
#define GET_BMPT_PTR(offset) getbmp(offset)
#define GET_DEF(index) getdef(index)

Also the following functions have to be defined (e.g. in usercode.c)

```
#ifdef ___CTR___
void        RD_MROM *getbmp(long index)
{
            void RD_MROM *def;
            long l;
            extern RD_CONST huge unsigned char osdlbmp[];

            l = (long)osdlbmp + (long)offset;
            def = (void RD_MROM *)l;

            return(def);
}
void RD_MBIN *getdef(XPTR index)
{
            void RD_MBIN *def;
            long l;

            l = (long)osdlini + (long)BINARYALIGNMENT * (long)index;
            def = (void RD_MBIN *)l;

            return def;
}
#endif
```

IMACS_01
The following defines have to be set:
#define GET_TXT_PTR(offset, textaccess) (textaccess) ? (long2farp(farp2long(vismemtxt) +
offset)) : (long2farp(farp2long(vismemtxtoff) + offset))
#define GET_BMP_PTR(offset) long2farp(farp2long(vismembmp) + (RD_size)offset)
#define PTR_2_ADR(ptr) ptr2adr(ptr)

```
#define GET_DEF(index) (void RD_MBIN *)long2farp(farp2long(vismemini) + (ALIGNMENT *
(long)index))
```

Also the following functions have to be defined (e.g. in usercode.c)

```
#if (defined(NO_EMB_HMI) && defined(___DEBUG___) && defined(NO_SYSTXT) )
long ptr2adr(void RD_MBIN *ptr)
{
            unsigned long wert, unten, oben;

            wert = (unsigned long)ptr;
            unten = wert & 0xffff;
            oben = wert & 0xffff0000;
            oben = oben >> 12;
            return(oben+unten);
}
#endif
```

EUROS_01
The following defines have to be set:

```
#define GET_TXT_PTR(offset, textaccess) (textaccess) ? (textbin_1 + offset) : (osdloff_1 +
offset)
#define GET_BMP_PTR(offset) (char RD_MROM *)(osdlbin_ger_1 + offset)
```

EUROS_02
The following define has to be set:

```
#define GET_TXT_PTR(offset, accesstype) (osdltxt + offset)
```

RTLINUX_01
The following define has to be set:

```
#define GET_TXT_PTR(offset, accesstype) (osdltxt + offset)
```

TQLINUX_01
The define can be safely removed and the following define has to be set:

```
#define GET_TXT_PTR(offset, accesstype) (osdltxt + offset)
```

(#1493) @HS

22 Develop Subversion 4.6.1

22.1 Code generation + runtime library

- ✓ CharsOver800h.bin is generated in Intel-Format regardless of Memory-Format setting (#1266)
- ✓ Fixed exported code for inherited remanent statemachines (#1292)
- ✓ For setting RV=<directory> the copy of CTR also copies empty directories (#1293)
- ⓘ Added CTR-parameter EMA=1 (easy metadata access) to enable using $# in if statements on targets without metadata stored in external flash (#1295)
- ☼ Added CTR-parameter SOI=1 (split osdl.ini) to split osdl.ini (#1291)
- ✓ For bitmaps with missing header information biSizeImage the routine for calculating the image size was fixed (#1297)
- ⓘ When scrolling in a menu only the menu is redrawn instead of whole screen (#1037)
- ☼ Scrolling in menus by drag&drop of a menu line (#1298)
- ☼ Allow blocking start of surface interpreter in surface interpreter (#1302)
- ✓ Fixed export of standard value of String elements with empty standard string (#1305)
- ⓘ Enhanced memory usage of second surface interpreter instance (#1302)
- ☼ Added support for custom dialogs in .rad-Files (#1303)
- ✓ Double export of functions in chains of inheritance fixed (#1309)
- ⓘ Throw precompiler error if parameter or system parameter data is bigger than reserved space (#1310)
- ⓘ The design compiler does not need the editor to check the license anymore (#787)
- ✓ Fixed crash in special case of recursive inheritance (#1308)
- ✓ Fixed crash for recursive pictures (#1277)
- ⓘ✗ The remapping of Katakana characters is deactivated by default and can be switched on with CTR-parameter MK=1 (map katakana) (#1327)
- ✓ Minor bugfixes for Defines in ENum edit dialog (#1303)
- ✓ Added missing macros for accessing external flash (#1331)
- ✓ Reset screen offsets for new surface interpreter instance (#1332)
- ✓ Editor and Common don't block each other in license getting anymore (#1328)
- ✓ Simulation window isn't shown while design compiling anymore (#1334)
- ✓ Fixed opening of surfaces in projects with direct edit and KEYOTHER-handling (#1336)
- ✓ Inherited functions of basemodules with multiple functionDef-sections fixed (#1341)
- ✓ Code generation fixed for ActionProcs within module arrays for setting ESM=1 (#1342)
- ✓ Fixed crash for empty pressed/released pict in Touchkeys (#1343)
- ⓘ For formal verification suite (FVS=1) all elements are exported as communication elements and name length shortening (NL=) is deactivated. (#1339)
- ⓘ Support more keycodes in AKey, ActionIcon and TouchKey (#1344)
- ✓ TouchKeys, ActionIcons and AKeys now can handle a few more special characters like german umlaute. (#1346)
- ✓ Pressed and Released-Buttons and TouchKeys now can be used in Conditions with relative positioning (#1345)
- ✓ Fixed issue of needing two licenses on license server for design compilation with open editor (#1328)
- ✓ Fixed possible crash for texts on TouchKeys/ActionIcons if one of the pictures is empty (#1348)
- ⓘ✗ New Define BITSPERPIXEL, global variables dis_zero_x/dis_zero_y removed, global variables DispSizeX/DispSizeY replaced by Defines with same name, global variables CharSizeX/CharSizeY replaced by Defines CHARSIZE_X/CHARSIZE_Y (#1351)

- ⓘ When trying to edit an element, where's an authorization necessary and this one is too low, then there appears the message 'Permission Required'. Having set the #define ED-IT_NOT_EDITABLE the message 'Not Editable' appears.
- ✓ Fixed a display problem of the value of an element in graphical languages.
- ⓘ Check for correct rc_lib version only during design compilation (#1375)
- ⓘ✖ Define SIM_SINGLESTEP isn't generated anymore for CTR-Setting FVS=1 (#1340)
- ⓘ✖ Global variables FSingleStep and FSSTrace removed (#1340)
- ⓘ If a text isn't used on the controller instead of exporting the textindex 0 an empty string is exported. This prevents displaying of wrong text, if trying to use that text anyway (#1330)
- ✓ If no selection was made for the edit mode of an element visualizer the dialog edit mode is selected. However in this case some texts needed for the dialog wasn't exported. (#1330)
- ⓘ Full Unicode support for Key-Values of ActionIcons, TouchsKeys, AKeys and elements of assigntype KEY (#1346)
- ✓ Corrected checking of Time-Value for time to string conversion (#1144)
- ⓘ✖ Routines for date handling enhanced. Valid dates now between 01.01.2000 and 31.12.2099. New syntax for routine str2date: void str2date(RD_char RD_MRAM *, long RD_MRAM *time);
  2nd parameter mode is deleted, because mode is now automatically detected.
  Character buffer for date2str always needs a length of 11 (#141)
- ⓘ Normal counters are deactivated for Formal verification suite (where counters are counted in Perm-Task. Also the code which is deactivated by Defines is always generated so FVS=1 isn't needed for this setting anymore. (#1388)
- ✓ Fixed some characters in Font 10p (#1396)
- ✓ Fixed definition of function c_toggle2() (#1391)
- ✓ Fixed buffer overflow in RTC routines for new date format (#141)
- ✓ Fixed crash for unknown Typedefs in Energy gropus (#1408)
- ☼ New Ctr-Setting ETA=1 to export all element and module tables in source.c as arrays instead of the current switch-statement construction. (#1397)

22.2 Product framework

- ⓘ Minor performance enhancement of simulated target display (#1287)
- ✓ Fixed crash when switching between playback and burst mode (#1294)
- ✓ Fixed editing of unsigned long variables and some visual errors for hexadecimal view and view with leading zeros (#1281)
- ✓ Fixed update of parameters and system parameters in visualization (#1281)
- ✓ Communication of multiple parameter blocks fixed for targets with communication protocol that supports sending distinct blocks (#1299)
- ✓ Fixed title of "Save parameters" dialog (#1301)
- ✓ Fixed cursor size for big fonts (#1307)
- ⓘ✖ Better accuracy of timers. The function simulateInter() was removed and calls of that function have to be deleted from usercode.c (#1311)
- ☼ New look and feel (#1312)
- ☼ Mode switching between simulation and visualization (#1313)
- ☼ Customizable plugin (#1314)
- ☼ Support for sequence export (#1315)
- ✓ Added missing #ifdef for simulation of targets without HMI (#1317)
- ✓ Standalone again runs without visual studio installation (#1319)
- ☼ New desktop-parameter EPM=1 (export parameters to measure-DB) to get also recording of changes of parameters (not only last active value) (#1326)

- New Visualization type using bitmaps data exchange and displaying is added
- Start Common without command line, saving last mode for new Common Start (without command line) are added.
- Crash on simulation start fixed (#1333)
- Removed some memory leaks (#1347)
- LongPacked Bit in Visualization is recognized.
- Output window is shown on correspondent Ribbon button in View Category
- Resizing functionality is adapted to all windows.
- Pre-Compiling functionality is removed (by command line without GUI in radEDIT is implemented).
- CalendarBar is removed from Project.
- Simulation without GUI update.
- For Modus switching Modus feature are added new functions in sim.dll.
- New Visualization type using bitmaps data exchange and displaying is added.
- Reinserted serial cclConnection (#1350)
- Lifecycle (Timing, Enable/disable/enable with limit) functionality for VIS/SIM modus is developed (#)
- Extended functionality for Plugin-Request of Lifecycle settings is added(#).
- Bugfix – DLLConnection, , Bitmap24- Visualization-usecase.(Bug#)
- rollback changes in Controller src.(Bug#)
- About radCASE dialog again working (#1374)
- Touch calibration data is initialized even if unused in simulation (#1376)
- Sequence recording can be synchronized with simulation tasks (#1340)
- Sequences can be inserted into simulation without external tool (#1340)
- Memory leak in sequence export fixed (#1340)
- Common will send data back over external interface, even if no sequence was loaded from an external application (#1340)
- Common doesn't crash anymore when exited with activated force mode and removed some memory leaks in connection with mode switching (#1352)
- cclConnection for ethernet replaced by old variant (#1352)
- Synchronized recording also works with external checker interface (#1340)
- Handshaking for external checker interface repaired (#1340)
- Mediation functionality for Framework is implemented;
- Properties are presented now in radCASE GUI formats;
- Bug "Colors dirty" on activation/deactivation Custom Views is fixed;
- Bug 1377 (Windows states logging) is fixed;
- StrukturPanel is completely removed. The functionality is covered by Modules Tree.
- Synchronized recording mode freezed PC on single core CPUs or when started without command line option (#1384)
- Added data export setting to automatically reset simulated application on record start (#1385)
- Data record settings not stored in recordsettings.txt anymore, but in config.ini (#1385)
- Bugfix 1387 – simulation crashes on stop/start button in record panel
- Bugfix 1390 crash on special design (tridomix)
- Bugfix 1392 –simulation freezing during recording
- Bugfix 1403 – Common hangs on exit if recording mode is on.
- Bugfix 1381 – Open menu wrong behavior on playback-mode
- Bugfix 1405 – Wrong visual style by default (until will be set explicitly).
- Bugfix 1383 - Keystrokes functionality in Simulation
- Application reset now resets Simulation and also calls all initializing functions (#1390)
- New version number definition. Enhanced About radCASE dialog to be able to better identify a version (#1404)

22.3 Documentation generation

✓ Fixed stretching of menus for documenting target display (#1290)
✓ Fixed buffer overflow for info texts of functions (#1300)
✓ ✖ Crash of doc generation in Release version. Currently only works for Release version of simulation. (#1380)

22.4 Editor

☼ Edit Project Settings Dialogs (Tab View with pages: System code, Timing, Ctr, Desktop) are Developed
☼ EDS Export is implemented
ⓘ E-Profiles Edit Dialogs, Adaption the properties settings Configuration XML Sheet for Energy templates
ⓘ Extension Project Settings Edit Dialogs (properties Sheet) to E-Profiles algorithm (One Edit string instead separate edit string for every TAB).
✓ Bug 1133 avoiding (external editor temporary data are created but are not monitored in Tmp directory) - temporary decision
✓ Remanent button is removed as well as correspondent functionality.
✓ Wrong Relative Positions for Picts, Unterpicts, Icons, AIcon, Fulls – this multiple error is fixed for all visual objects Draw- functionality.
✓ Pict-Auswahl in der Box bei "Tvis_Global" => die <if> werden nicht beachtet, daher erscheinen Items mehrfach (Vorschau der Picts dort stimmt) – is fixed in LIB.
✓ beim Neuerstellen eines Projektes kommt die Dialog-Box "Datei öffnen".
✓ „radCASE Icon der rad-Dateien fehlt" – is fixed.
✓ Error on visualization AICON is fixed.
✓ State Chart . Ansatzpunkte an Rechteck dann immer auf Mittelpunkt
✓ State Chart. "Zeichentool" verbessern
ⓘ Renaming of Elements – is developed for ELEMs in Signal diagrams and Surfaces.
✓ State Chart . Error on "new Connection"- fixed.
✓ Signal Chart . Error on STRG and "Hand" – fixed.
✓ Signal Diagram- New functionality for mouse cursor
✓ Signal Connection new implementation and refactoring – for reconnection..
✓ Signal Chart. Fix for connections between ELEMS and Signal Icons.
ⓘ Activity diagram refactoring- add node in transition by shift Left Button, Cursors adopting (sample – as in signal chart).
ⓘ State chart diagram refactoring - add node in transition by shift left Button, Cursors adopting (sample – as in signal chart). Creation transaction of State chart - without ctrl (only left mouse button) pressing.
ⓘ Base Points ("Stützpunkten") – functionality in State Chart implementation
ⓘ Base Points ("Stützpunkten") – functionality in Activity chart implementation
✓ Activity and State Machine functionality. Fixing an error that leads to problems to select a line in diagrams. New functions for line tracking are implemented.
ⓘ New functionality in activity and state masc. diagrams – "no transaction tool", no "state tool", the whole functionality (context menus, connections creation and so on) is unified with signal chart.
ⓘ State Machine new mouse behavior (Transaction tracking, adding/removing nodes) is implemented.

- ✓ State machine: Labels behavior for knots adding/removing is implemented.
- ✓ Activity chart:Transition Reconnection functionality for activity chart.
- ✓ Small changes to except too large coordinates values handling.
- ✓ SHIFT-F9 doesn't work for inherited elements (for Modules generalization is fixed, must be extended for generalization use case of sub modules elements).Space between two chars = min of (1, Font high / 8).
- ✓ „Referenzierte Oberflächen von geerbten Modulen werden nicht angezeigt" – is fixed.
- ⓘ Energy View Implementation: E-Groups/E-profiles Icons and Images in Tree View and Dialogs. Editable profile arguments in Select Profile List-Control are implemented.
- ⓘ Export E-Groups and E-Profiles in Module.xml (Pre-compiling extension)
- ✓ BUG State Chart. BUG: On Click - again big size is fixed.
- ✓ State chart. Transaction start - sensitive area with frame - not only line – is fixed.
- ✓ Element renaming synchronization with Left View select Changing; Copy_n_ name for edit copy past Elements
- ✓ Copy of elements – adding "Copy_ of" is produced only in case if the copy is created in the same module.
- ✓ Now texts are created empty in copied element.
- ⓘ Context Menu (Types) for SURFACE_WEB is adopted in Left View.
- ⓘ Color Buttons Implementation in Edit Settings Tab View.
- ⓘ Project Settings: new functionality is developed – check-Boxes for not a System code page. The Setting's schema is extended for defaults values. Settings.xml is changed: checkboxes for not system code pages and default values are entered. Numerical lists values
- ☼ Surfaces: Context menu in Surfaces VIEWs - by right mouse button - > creating visual objects, copy paste in context menu implementation.
- ⓘ Updating visual surfaces views after edit Cut/edit Copy /edit paste
- ✓ Bug 1260 Editor crashes – fix in CVisProjectClass implementation.
- ⓘ Touch key class – new visualization, adapting to new requirements.
- ✓ Class Diagram: Do not present signal modules.
- ⓘ Class Diagram: Class Note (Comments) Object presentation (as in Enterprise Architect)
- ☼ Class Diagram Implementation of Context Menu for new objects creation: New classes, subclasses, new methods, new Elements, - all possible objects.
- ⓘ Class Diagram Implementation - by Connection Creation not only Composition/generalization, but aggregation, dependency, association.
  Note: 50% is implemented.
  TODO: must completely implemented.
- ✓ Sequence, Component, Composition and sequences diagrams views are disabled;
- ⓘ Pre-Compiling functionality: Producing Modul.xml from a command line,
  license is not proved; Main Window is disabled and not visible.
- ✓ Fixing the dangerous old code in Copy-Past functionality is done.
- ✓ All Changes and extensions are listed in Change Log.

22.5 Rad-Library

- ☼ Added first draft of dialog-library to use as basis for custom dialogs (#1303)
- ☼ New library with desktop-parameter EPM=1 (export parameters to measure-DB) to get also recording of changes of parameters (not only last active value) (#1326)
- ⓘ Finished functionality of ENum-edit dialog in new dialog library (tvis_dialogs.rad) (#1303)
- ⓘ New keys Bitmaps are added in global24Bit
- ⓘ Added functionality of EStr edit dialog in new dialog library (tvis_dialogs.rad) (#1303)
- ⓘ✗ Added Communication functions (files RdnComm.c / .h and ImacsProt.c / .h) to ctr_lib.

- ⓘ Added functionality of Password input dialog into new dialog library (tvis_dialogs.rad) (#1303)
- ⓘ Added functionality for hidden password entry in new dialog library (tvis_dialogs.rad) (#1303)
- ✓ Fixed error with inserting in strings in (tvis_dialogs.rad) (#1303)
- ⓘ Added functionality of ETim edit dialog in new dialog library (tvis_dialogs.rad) (#1303)
- ⓘ Added functionality of EDat edit dialog in new dialog library (tvis_dialogs.rad) (#1303)
- ⓘ Added functionality of EBin edit dialogs in new dialog library (tvis_dialogs.rad) (#1303)
- ⓘ Added functionality of AskOK and RTC dialogs in new dialog library (tvis_dialogs.rad) (#1303)

22.6 API-Interface

- ⓘ✖ Added Communication functions (files RdnComm.c / .h and ImacsProt.c / .h). Their interface differs slightly to currently used functions, see documentation for details.
- ✓ Bugfix in Communication : Transfer of IO Data failed under certain conditions

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23.1 Code generation + runtime library

- CTR-Setting AIS=1 (array index substitution) for using array index instead of Controller-ID for communication in distributed systems (#906)
- Adressing of Fulls in module arrays within modules fixed (#909)
- Better error detection: Warning if surface label contains leading or trailing space
  Error if Surface_Icon references not existing Surface_Vis (#915)
- Warning missing braces removed from generated code (#690)
- Wrong element references corrected in special case of design structure (#936)
- Unified the format of memio.dok. PAR strings now have the same format as the rest (#326)
- If statement corrected in function RdStackCheck (#814)
- Open in AEnter fixed (#899)
- Wrong string limiting for surfaces with less than 40 columns and less than 8 lines fixed (#853)
- Fixed unit conversion of stepwidth for INC/DEC for non linear conversions (#834)
- Error localization works for transitions again (#960)
- Floating point functions available for "Complete element access" (#967)
- Export global code of statemachines in Dos/Windows-format (CRLF) (#925)
- CEA=1 also supports EBINs now (#968)
- Further floating point functions available for "Complete element access" (#967)
- New menu cursor option 4 for inverting whole line (#991)
- MAX_CTR_TEXT_LEN is exported as maximum bytes of memory needed for UTF-8. ESTR elements are considered also, there no longer the length but maximum number of bytes has to be specified in case of UC=2. (#989)
- Data preservation expanded for PROC-data (#999)
- New standard processing type SIGNAL to use for modules meant for signal icons (#1005)
- Fixed error reporting for missing Textdefs in module descriptions (#1006)
- Use module instance name as description if description is empty (#1007)
- Removed warning for NO_EMB_HMI (#1008)
- Element structure is generated for elements with Comtype Dx on targets without HMI (#1011)
- Submodule pointer is created correct for targets without HMI and with subnodes (#1012)
- Support for proportional fonts in menus (#1019)
- Fixed inverted menu line (cursor 4) for proportional fonts (#1019)
- Support of different scroll options in menus over Define RD_MENU_SCROLL_TYPE (#1023)
- Throw error if standard value of String element is too long (#1030)
- Singlestep scrolling fixed for menus with jumping from last to first point (#1023)
- Fixed export of module structure for a special case of inheritance (#1040)
- Support for standard values for each element of element arrays (#1034)
- Fixed scrolling in a menu for different scroll modes (#1023)
- If the logical calibration value overflows an error is thrown (#1045)
- Touch support in menus (#1027)
- Scrolling up limited to line 0 (#1023)
- Bugfix for menu line detection for touch support in menus (#1027)
- Fixed crash for touch support of menus, if invisible menu line was selected last (#1055)
- Fixed redraw of menu, for conditionsal menu lines (#1056)
- Modules of basemodules can be overwritten in inherited modules (#1058)
- Touch support in menus fixed for menus without scrollbar (#1027)

- ✓ Include paths ISO standard conform (for linux compatibility) (#1068)
- ✓ Date edit fixed (#1070)
- ✓ Moved ao_write and ao_read into Define NO_FORCEMODE (#1071)
- ✓ Scrolling to first line in menus with full page scrolling fixed (#1081)
- ✓ Clear rectangle for proportional fonts fixed on exiting a surface (#1082)
- ⓘ✖ Arrows in Scrollbars are removed and should be replaced by Touchkeys (#1083)
- ✓ Buffer overflow fixed for element initialization (#1089)
- ⓘ Automatic export of new pictures used in rc_lib (#1094)
- ✓ Made drawing of elements interrupt safe (#1105)
- ☼ New proportional font 24p (#1120)
- ✓ Correction of daylight saving if 31th is on Sunday
- ✓ Use of ++ for elements with comtype Ex fixed (#40, #42)
- ✓ Element arrays in module arrays can be used (#40, #44)
- ✓ Referencing with § in special cases fixed (#40, #837)
- ✓ Ctr-Setting NL= consided for $~ (#40, #857)
- ✓ Code export in special case of inheritance fixed (#40, #905)
- ✓ Fixed crash in special case of Ctr-Setting SMC= (#40, #1066)
- ☼ Assignments using +=, -=, *=, … can now be used for all radCASE elements (#40, #342)
- ☼ Assignment = and += can be used for String elements (#40, #342)
- ☼ $~ can now be combined with other special operators e.g. $~*elem (#40)
- ⓘ Dollar replacement and error reporting enhanced (#40, #127, #373, #1013)
- ⓘ✖ Redundant undocumented access $*elem->maxRange, $*elem->minRange and $*elem->setup removed. Use $#elem->… instead. (#40)
- ✓ Corrected export of element structures for module arrays with variable index (#1130)
- ✓ Export of bitmap with missing header information biSizeImage fixed (#1141)
- ✓ Fixed usage of $~ with ActionPuts and module pointers (#1130)
- ✓ Double export and export order fixed for special case of inheritance (#130, #1064)
- ⓘ Code optimization in c_edit_num2() (Editing of float elements) (#887)
- ✓ Version with preceding zero not interpreted as octal number (#1119)
- ⓘ Error message when using Desktop settings AN= or DN= and surface is not found (#858)
- ✓✖ The global code of statemachines is now exported for basemodule and inherited module instead of only exporting the code of the basemodule (#969)
- ✓ Fixed use of Signal Icons in module arrays (#1112)
- ⓘ VisBinIcons are also checked for right usage of CBitmap/WBitmap (#1131)
- ✓ Fixed exported code for special element access functionalities in special C-structure (#40)
- ⓘ Support switch($element) for ENUMs, too (#1148)
- ✓ Fixed access of CANOpen-SDO elements on targets without HMI (#1146)
- ✓✖ During in a statemachine is only executed if no transition has fired (#1153)
- ✓ Eliminate warnings for transition code pointers (#1155)
- ☼ ActionIcons and Touchkeys support hover effect (#905, #554, #1157)
- ☼ Added support for background restoration with color BACKGRND (#1160)
- ✓ Fixed Ctr-Setting EAI=1 (Export all IOs) (#1176)
- ☼ New Ctr-Setting ATP=1 (Assign type prefix) to enable prefixes to generated element names (#1165)
- ⓘ Added define for every pointer tab in rdi_pnttab.c (#1183)
- ☼ Added Gamma support (#1182)
- ✓ Fixed some export errors in conjunction with subnodes (#1165, #1190)
- ✓ Fixed export of VisElems using $~ (#1165)
- ✓ Fixed export of code for access of element in indistinct module using $~ (#1205)
- ☼ Added fonts 36p and 48p (#1219)
- ✓ Further fixes for $~ and subnodes (#1165)

- ✓ Color 0 is exported as black (#1193)
- ✓ Fixed export of surfaces in special case of inheritance (#1218)
- ✓ Fixed generated code for accessing elements in distinct module from indistinct module useing $~ (#1206)
- ✓ Fixed Defines for IOs in system module (#1165)
- ✓ Fixed memory offset for menus in Fulls (#1221)
- ✓ Fixed potential buffer overflow for picture export on big displays (#1220)
- ⓘ Enhanced error message for not found elements/functions (#1191)
- ⓘ Added error message for calls to module arrays in multiple instances (#1132)
- ✓ Fixed transmission of NodeID for elements with comtype Ex in module arrays (#1184)
- ✓ Fixed errors for element prefix in rdi_pnttab and module pointers (#1165)
- ✓ Menu functions consider RD_NO_FULL (#1223)
- ✓ Fixed errors in generated code for some element visualizers (#1165)
- ✓ Fixed call to function using _pMod in special case of inheritance (#1224)
- ✓ Fixed rdi_pnttab for entries in global structure (#1165)
- ✓ Target Node-ID of elements with comtype Ex within subnodes is node-ID of root module (#1184)
- ✓ Mirror memory is not accessed anymore for submodules in case of UKE=1 (#1227)
- ✓ Generated next pointer is created correct for targets without display and subnodes (#1228)
- ✓ KeyAbort will abort open in AEnter (#1229)
- ✓ Fixed generated code for module pointers (#1231)
- ✓ Right alignment of EBIN-values fixed (#1232)
- ⓘ Function pointers in statemachines replaced by transition IDs (#1234)
- ✓ pMod-Argument fixed for module pointers (#1235)
- ⓘ Function pointers are only generated for overwritten functions (#1237)
- ✓ Usage of element arrays in signal modules fixed (#1238)
- ✓ Usage of one line comments in signal modules with flat generation fixed (#1192)
- ⓘ Texts for element visualizers are only exported for dialog edits (#1241)
- ⓘ Throw error for WBitmaps in Surface_CTR for VisLine and VisRot (#1131)
- ✓ Repaired usage of SV=element (#1134)
- ✓ Fixed export of asynchronous messages of sequence diagrams (#1237)
- ✓ Element export into GLOBAL_-structures repaired for module arrays (#1250)
- ⓘ Automatically add semicolon in code field of activity charts (#1252)
- ☼ Added silent mode for design compilation (#1256)
- ✓ ✗ Macro usage for accessing external flash added for $#. Because of those macros usage of $# isn't possible in an expression at the moment (e.g. in an if-statement). (#1262)
- ☼ Design compilation abortable by external application (#1261)
- ⓘ Common returns error code for design compilation errors (#1263)
- ⓘ Enhanced output and error codes for batches (#1265)
- ✓ Fixed exported module structure for special case of overwritten function (#1267)
- ✓ Fixed export of element structure for elements only used in APerm (#1269)
- ☼ Support in code generation for Formal verification suite is added (#1268)
- ☼ New standard processing type PARAMUPD (#1274)
- ✓ Corrected arrays sizes for bar visualizers in Fulls (#1275)
- ✓ Fixed missing release of hover effect of ActionIcons (#1276)
- ✓ Element name is only used as element description if no text is selected (#1279)
- ☼ Added touch support in doSetup() (#1273)
- ✓ If setting DP=0 some RDI-settings were set as if using DP=1 (#1284)
- ☼ Added energy simulation (#1255)
- ✓ Fixed crash for using EProfiles without defined EGroups (#1255)
- ✓ Fixed crash for flat generation signal modules (#1255)

23.2 Product framework

- ✓ Editdialog for Time-values, without showing centiseconds fixed (#926)
- ☼ Look of element visualizers in signal charts adapted to new look in editor (#911)
- ✓ Moduleinfo is not opened anymore, when selecting element info (#931)
- ⓘ Desktop setting SP=1 (structure panel) removed. Structure panel is now shown on authorization level 9 instead. (#914)
- ✓ Visualization for Statemachines fixed for Statenames, which are IDs for multilingual texts (#937)
- ⓘ For targets without communicated display data, the Visualization doesn't show offline as display data anymore. (#735)
- ✓ Surface selection dialog supports $DM (#916)
- ✓ Rounding error fixed in processing of simulation equations (#965)
- ☼ Logical OR (|) and logical NOT (!) added to simulation equations (#116)
- ✓ Crash fixed when reopening histogram directly after closing (#966)
- ⓘ Error message "sim.dll not found" improved to show standard error cause (#254)
- ⓘ Multilingual selection texts are supported in element info for multiselective EBINs (#981)
- ✓ Lines are positioned correct in FULLs in Surface_Vis (#978)
- ⓘ The Array ModuleNames[] was only used in simulation for determining the number of modules. The array is replaced by a generated integer value (#997)
- ✓ Standalone generation fixed for OSDL_SYS-path with spaces (#985)
- ⓘ Distance between characters of proportional fonts smaller (#1022)
- ☼ Surfaces can be maximized (#1033)
- ⓘ Signal modules are not displayed in structure panel (#1047)
- ⓘ Some information added in Module info and element info. Change title of module view (#1050)
- ✓ Selecting standard value of ETims in dialog fixed for standard value in different format than the element. (#1053)
- ⓘ Changes for messages in time limited demo version (#1079)
- ⓘ All features of simulation/visualization are now enabled in demo version (#1078)
- ✓ Corrected positioning of Clear-Rectangle in simulation-API (#1080)
- ⓘ Show "playback" on simulated display in playback mode of simulation (#1084)
- ✓ String size calculation in Simulation API fixed for empty strings (#1085)
- ✓ Simulation can be compiled without forcemode (#1093)
- ✓ Fixed drawing of statemachine takes up 100% CPU for special saved window size (#1100)
- ✓ EEPROM data can be saved in simulation for projects without HMI (#1104)
- ✓ ao_read() added to simulation-API if forcemode is deactivated (#1116)
- ✓ Graphical error fixed for special coordinates of signal connection (#1149)
- ✓ Automatic daylight saving fixed for simulated RTC (#1163)
- ⓘ Performance enhancement for scrolling in histograms (#121)
- ✓ drawing routines locked correctly against each other (#1179)
- ⓘ Color NON now supported for all graphical elements (#860)
- ☼ Desktop-setting DTD=1 (debug target display) for debugging drawing routines in simulation. (only activate if debugging graphical issues; makes simulated target display really slow) (#1194)
- ⓘ Performance enhancement of simulated target display (#1160)
- ⓘ Distance between characters of proportional fonts 1 pixel wider (#1207)
- ✓ Fixed support for fonts 14p and 16p (#1219)
- ✓ Freeze fixed for specific datasets in histogram (#121)

- ✓ Fixed incomplete display of large data recordings (#1226)
- ⓘ Enhanced auto correction for data recordings (#1239)
- ⓘ Reformated module view to allow longer element names (#1245)
- ✓ Width of last character of string with proportional font fixed (#1249)
- ⓘ Distance between two characters of proportional fonts is calculated in dependence of the font height (#1257)
- ☼ Single step mode, sequence support and data interface for formal verification suite (#1264)
- ⓘ Performance enhancement in single step mode (#1264)

23.3 Documentation generation

- ✓ Subtext for EBINs are supported (#990)
- ☼ Support for multiple signal charts in one module (#798)
- ⓘ Surface_Vis of multiple instances only exported once (#1098)
- ✓ Heading of DT-Entry fixed for UTF-8 (#1124)
- ✓ Fixed deadlock (#1230)
- ✓ Surfaces with Doktab in a subnode are only exported for UKE=1 (#1233)
- ✓ Fixed crash in documentation generation (#1288)

23.4 Editor

23.5 Rad-Library

- ⓘ Touch diagnosis can be left on targets without keys (#904)
- ✓ Corrected referenced libraries in AlarmManager.rad (#958)
- ✓ Corrected date/time format in SD-Card.rad (#959)
- ✓ Replace C++ code by ANSI-C code in hmi_touch.rad (#1145)
- ✓ Corrected Sel1of4 in sig_analog.rad (#1147)
- ✓ Corrected data casting in sig_analog.rad (#1150)
- ⓘ hmi_touch.rad translated and support for bigger displays (#442, #1156)
- ✓ Corrected compsmall signal module in sig_analog.rad (#1242)
- ✓ Corrected COMPnotequ signal module in sig_analog.rad (#1242)
- ⓘ Replaced picture of Icon(50) to be independent from vis_global.rad (#1243)
- ⓘ Added touch support to ethernet.rad (#1278)

23.6 API-Interface

- ✓ Define RD_NO_KEYMAP_FUNC repaired so the API functions for keymapping are not needed (#1074)
- ☼✗ New touch specification. Has to be implemented only for new hover effect (#1157)
- ☼✗ New API-function c_dis_layer() for background restoration (#1160)
- ⓘ✗ New specification for distance between characters in proportional fonts (#1257)
- ☼ Function executePARMUPD() can be called every time parameters are updated, because the function is always created, regardless of usage in the design. (#1274)