CubeSuite+ CX Compiler V1.30

Release Note

R20UT2245EJ0100
Rev.1.00
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Contents

Chapter 1. Target Devices

The target devices supported by the CX are listed on the Website.

Please see this URL.

CubeSuite+ Product Page:

http://www.renesas.com/cubesuite+

Chapter 2. User's Manuals

Please read the following user's manuals together with this document.

Manual Name	Document Number
CubeSuite+ V1.03.00 Coding for CX compiler	R20UT2139EJ0100
CubeSuite+ V1.03.00 Build for CX compiler	R20UT2142EJ0100
CubeSuite+ V1.03.00 Message	R20UT2147EJ0100

Chapter 3. Key Points for Selecting Uninstallation Method

There are two ways to uninstall this product.

- Use the integrated uninstaller (uninstalls CubeSuite+)
- Use separate uninstaller (uninstalls this product only)

To use the separate uninstaller, select the following from the Control Panel:

- Add/Remove Programs (Windows XP)
- Programs and Features (Windows Vista, Windows 7)

Then select "CubeSuite+ CX V1.30".

Chapter 4. Changes

This chapter describes changes of CX.

4.1 Changes of CX

This section describes changes of CX from Ver.1.21 to Ver.1.30.

4.1.1 Improved optimization/changed output code

Optimization has been improved, and the output code changed. The main changes are as follows.

- Improved output code of switch instruction
- Improved scheduling around the volatile variable access
- Improved saving/restoring registers around __asm and embedded functions
- Deletion of redundant unconditional branches
- Improved initialization of local variables
- Improved inline expansive condition of the function
- Improved output code of division and remainder whose divisor is exponent of 2.

4.1.2 Support for CRC operational function

To support CRC operational function, following two options have been added.

“-Xcrc”

This option is equivalent to the following property in CubeSuite+.

- From the [Hex Output Options] tab, [Operate CRC], [CRC result output address], [Range of CRC] in the [CRC] category

“-Xcrc_method”

This option is equivalent to the following property in CubeSuite+.

- From the [Hex Output Options] tab, [Type of CRC], [Initial value of CRC] in the [CRC] category

Regarding details of the options, please refer to the “CubeSuite+ V1.03.00 Build for CX compiler” manual.

4.1.3 Support for User Option Byte

User Option Byte function has been supported.

If “Yes(Using Default of Device)(None)” is specified at [Set user option byte]property in CubeSuite+, the default value specified by the device file is embedded in the user option byte area.
It's possible to embed any Option Byte by describing as follows in assembler source file and specify “No(-Xoption_byte=none)” at [Set user option byte] in CubeSuite+.

```
.CSEG OPT_BYTE
.DB 0x11
.DB 0x22
.DB 0x33
.DB 0x44
.DB 0x55
.DB 0x66
```

4.1.4 Support for -Xopt_option=-Ogc option

-Xopt_option=-Ogc option has been added. This option prevents increase in the stack size at the default optimization level.

Please specify this option directly in the following property in CubeSuite+.
- From the [Common Options] tab, [Other additional options] in the [Others] category

4.1.5 Removal of restrictions

One restriction below has been removed.

No. 12 Incorrect branch code may be output

[Description] When all the following three conditions are met, the incorrect branching may take place by the instruction which is specified by the second condition.

<Conditions>
1. A V850E2M CPU core is used.
2. In an assembly-instruction string generated by compiling the C source file or an instruction string in the assembly source file exists any of the following branch instructions.
   - jarl
   - jarl22
   - jcond
   - jr
   - jr22
3. The branch destination of the branch instruction falls outside one of the following limits.
   - 64 MB in CX compiler V1.2x
   - 128 MB in CX compiler V1.00 through V1.11

Chapter 5. Cautions

This section describes cautions for using CX V1.30.

5.1 Handling of r1 register in interrupt function

The assembler uses the r1 register as a temporary register when expanding an instruction. Consequently, the r1 register may be used through instruction expansion even if there is no description on the r1 register in an assembler source file.

Save/restore the r1 register contents when describing interrupt functions with the assembler.

5.2 Debug information

Debug information is not output to codes in a file specified by the .binclude quasi directive, codes in a macro defined by the .macro quasi directive.

5.3 The access to bit field with structure packing

If the width of a bit field is less than the data type of a member when the bit field is accessed during structure packing, the bit field is read as having the width of the data type of that member. Consequently, an area outside the object (an area where there is no data) is also accessed. This access is usually executed correctly but it might be invalid if I/O is mapped.

```
Example:
struct S {
    int  x:21;
} sobj;  /* 3 bytes */
sobj.x = 1;
```

5.4 Specifying far jump calls for static functions

When specifying a static function in the far jump calling function list file, please add a period (".") and number after the function name.

At compile time, CX converts the names of the static functions to label names consisting of the function name followed by the period and number. For this reason, even if you specify a static function in the far jump calling function list file, you must specify a period and number after the function name. Please output the assembler source file, and check this label name.

Example: Function "func" with "static" is called via far jump

1. Search for the call to function "func" in the assembler source file, and check the converted label name.

   jarl _func.0, lp <- It has been converted to a label name with a period and number added

2. In the far jump calling function list file, enter the label name you checked in 1.

   [func.fjp]

   ```
   _func.0
   ```

3. Use the "-Xfar_jump" option to specify the far jump calling function list file you created in step 2.

   >cx.exe –Cf3507 -Xfar_jump=func.fjp main.c

4. The call to function "func" is converted to code using the jarl32 or jr32 instruction.

5.5 Symbol information file with variable defined in assembly source

In an application where a variable is defined in the assembly source and that variable is referenced in the C source, an error occurs if the symbol information file is generated by symbol file generator.

Please delete the variable in the assembly source from the symbol information file.

5.6 Assembler instructions written within #pragma directive

CX can’t support .macro, .rept, .irp macro directives within #pragma directive. If these macro directives are written, compiler error will occur.

5.7 -Xdelete_func option

This option deletes the function which is called from only the assembler source file as the unnecessary function.

5.8 Influence to debugging by subroutinization

When applying automatic subroutinization, there is a possibility that the program can’t be debugged right.

- A break point can't be set near the subroutinized code.
- Step execution can't be done near the subroutinized code or the line status isn’t correct.
- Variable value isn’t correct after subroutinized code.

Chapter 6. Restrictions

This chapter describes the restrictions of the CX.

6.1 Restrictions of CX

Below is a list of restrictions of the CX V1.30.

No.	Restrictions
1	Specifying the "-Xno_romize" and "-Xtwo_pass_link" options simultaneously causes an error
2	Input file names containing non-ASCII characters

6.2 Restrictions on Using V1.30

The following restrictions apply to CX V1.30.

No. 1 Specifying the "-Xno_romize" and "-Xtwo_pass_link" options simultaneously causes an error

[Description] When the "-Xno_romize" and "-Xtwo_pass_link" options are specified simultaneously, then an F0562003 error will occur if a file with the same name as the output load module file already exists.

F0562003:"*file*" is not ELF file.

[Workaround] Delete any file with the same name as the output load module file before running.

No. 2 Input file names containing non-ASCII characters

[Description] If the file name (including the path) contains no-ASCII characters, one of 1 or 2 below will occur if "-Xpass_source" is specified.

1. C source lines output as comments in the assembler source file will be invalid
2. An E0592018 error will occur
   E0592018:Failed to open an list file "*file*".

[Workaround] Change the file name (including the path) to one that does not contain non-ASCII characters.

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