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**[Upgrade to version]**

R20TS0363EJ0100

Rev.1.00

**C/C++ Compiler Package for RX Family V3.00.00**Nov. 27, 2018

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## Outline

We have upgraded the C/C++ Compiler Package for RX Family CC-RX from V2.08.00 to V3.00.00.

V3.00.00 has added support for the RXv3 core. Support for the RXv3 core instruction-set and functions enables an efficient system development for the RXv3 core-based MCUs.

A V3 license is required to use the V3.00.00 and later versions. Note that the V3 license is different from the V1 and V2 licenses for V1.00.00~V1.02.01 and V2.00.00~V2.08.00.

## 1. Products and Versions to Be Updated

CC-RX V2.00.00~V2.08.00

## 2. Description of Upgrade

The main features of the upgrade are described in the following sections. The features that are only available when a professional license is registered are indicated by [Professional edition]. Features which are specific to the RXv3 core-based MCUs are indicated by [RXv3].

For details, refer to the release note from the following URL.

(Scheduled to be released on November 27.)

<https://www.renesas.com/search/keyword-search.html#genre=document&q=r20ut4321>

### 2.1 Support for RXv3 Instruction-Set Architecture [RXv3]

Support for the RXv3 instruction-set architecture has been added.

By specifying an option `-isa=rxv3` for the compiler or assembler, the object codes are generated using the RXv3 instruction-set.

For details of the RXv3 instruction-set architecture, refer to the software manual from the following URL.

(Scheduled to be released on November 27.)

<https://www.renesas.com/search/keyword-search.html#genre=document&q=r20us0316>

### 2.2 Outputting CRC Operation Results to Binary Files

The results of CRC operation can now be output to binary files.

In versions earlier than V3.00.00, the `-crc` option is valid only when `-form{hexadecimal | stype}` is specified, however, in V3.00.00, it is also valid when `-form=binary` is specified. This enables the CRC operation results to be output to an abs file that is used during debug.

### 2.3 Extension of `-output` option for Hex File Load Address Origin

A load-address can now be specified for a suboption of `-output=suboption`, an optimizing linkage editor option which specifies an output file name.

When `-output=load-address` is specified, the starting-point of load address on the file is changed to the address specified in the load-address when an Intel expanded hex file or Motorola S type file is output. This option is useful when generating a file with the Position Independent Code (PIC) function enabled.

## 2.4 Section Allocation to Unused Vector Area

Optimizing linkage editor option `-split_vect` has been added.

By using `-split_vect`, a vector table section is created for each vector number. No section is created for a vector number that is not used, allowing unused vector areas to be used for other purpose.

## 2.5 Enhanced Feature for Detecting Illegal Indirect Function Calls [Professional edition]

Feature for detecting indirect function calls to illegal addresses has been enhanced.

A library files (\*.lib) can now be specified for `-cfi_ignore_module` option. This allows you to specify more specific target for the detecting function.

## 2.6 Additional Options Available for Library Generator

Specifying some options for the library generator resulted in a compile error, preventing library generation. This problem has been fixed. The options below can now be specified for the library generator:

- `-create_unfilled_area`
- `-stack_protector` [Professional edition]
- `-stack_protector_all` [Professional edition]
- `-misra2012` [Professional edition]

## 2.7 Enhanced Optimization

Optimization has been improved, such as effective use of array elements that are loaded during repeat statement processing, to increase the execution speed by reducing the number of times array elements are loaded. An example of source code and generated code is shown below.

```
// Source code example
void func(unsigned char* p, int n) {
    unsigned int i, j;
    unsigned char temp;
    for (i = 0; i < n; i++) {
        for (j = 0; j < n - i; j++) {
            if (p[j] != 0 && p[j] > p[j + 1]) {
                temp = p[j];
                p[j] = p[j + 1];
                p[j + 1] = temp;
            }
        }
    }
}
```

```

// Code generated by
V2.08.00
_func:
    CMP #00H, R2
    PUSH.L R6
    BEQ L19
L11:
    MOV.L #00000000H, R14
    MOV.L R2, R15
L12:
    CMP R2, R14
    BEQ L18
L13:
    MOV.L R15, R5
    MOV.L R1, R3
L14:
    MOVU.B [R3], R4
    CMP #00H, R4
    BEQ L17
L15:
    MOVU.B 01H[R3], R6
    CMP R6, R4
    BLEU L17
L16:
    MOV.B R6, [R3]
    MOV.B R4, 01H[R3]
L17:
    ADD #01H, R3
    SUB #01H, R5
    BNE L14
L18:
    ADD #01H, R14
    SUB #01H, R15
    CMP R2, R14
    BNE L12
L19:
    RTSD #04H, R6-R6
    
```

```

// Code generated by V3.00.00
_func:
    CMP #00H, R2
    PUSH.L R6
    BEQ L19
L11:
    MOV.L #00000000H, R14
    MOV.L R2, R15
L12:
    CMP R2, R14
    BEQ L18
L13:
    MOVU.B [R1], R3 ; Moved to an outer loop
    MOV.L R15, R5
    MOV.L R1, R4
L14:
    MOVU.B 01H[R4], R6
    CMP R6, R3
    BLEU L17
L15:
    TST #0FFH, R3
    BEQ L17
L16:
    MOV.B R6, [R4]
    MOV.L R3, R6
    MOV.B R3, 01H[R4]
L17:
    ADD #01H, R4
    SUB #01H, R5
    MOV.L R6, R3
    BNE L14
L18:
    ADD #01H, R14
    SUB #01H, R15
    CMP R2, R14
    BNE L12
L19:
    RTSD #04H, R6-R6
    
```

## 2.8 Other Modifications

A problem which causes an internal error during build has been fixed.

## 2.9 Items Revised

The issue described in the following note has been corrected.

- RENESAS TOOL NEWS, Document No. R20TS0334EJ0100
  1. Point for caution regarding the static variable declaration of an array, structure, or union that has an initializer (No. 49)

For details regarding this problem, refer to the URL below:

<https://www.renesas.com/search/keyword-search.html#genre=document&q=r20ts0334>

## 3. Updating Your Product

A V3 license is required to use the CC-RX V3.00.00. See Section 5 before updating your product.

### 3.1 Updating Online

On the Start menu, select Programs → Renesas Electronics CS+ and start the Update Manager to update the program. The update will be available on Nov. 27.

If you are using a floating license, download the Floating License Management Software V2.02.00 from the URL below for an installation.

<https://www.renesas.com/rx-c-download>

### 3.2 Download Installer from Web

Download the installer from the following URL for an installation. (Scheduled to be released on November 27.)

<https://www.renesas.com/rx-c-download>

Also download and install the License Manager V2.02.01 from the same URL.

When you use a floating license, you also need to download V2.02.00 of Floating License Management Software from the URL above to install the program.

## 4. Free Evaluation Edition

Before purchasing the compiler product, you can evaluate its performance and functionalities by using the evaluation edition.

Download the evaluation edition from the following URL. The installer will be available on November 27.

[https://www.renesas.com/tool\\_evaluation](https://www.renesas.com/tool_evaluation)

Evaluation Software CS+ for CC V8.00.00 (Single Download)

CSPlus\_CC\_Package\_V80000.EXE

RX Family C/C++ Compiler Package V3 (without IDE) V3.00.00

CC-RX\_V30000\_setup.exe

## 5. How to Purchase a Product

To order a product, contact your local Renesas Electronics sales office or distributor with a product name and orderable part number.

For product pricing, contact us in the same manner.

**Revision History**

Rev.	Date	Description	
		Page	Summary
1.00	Nov. 27, 2018	-	First edition issued

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