

## Note on Using CubeSuite+ CX Compiler

When using CubeSuite+ CX Compiler, take note of the following problem:

- With branches to incorrect addresses by branch instructions (No. 12)
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### 1. Versions Concerned

CubeSuite+ CX Compiler V1.00 through V1.21

### 2. Description

The V850 architecture specifies that the branch destinations of branch instructions should fall within a range of +2 MB or -2 MB from their branch points, and if this limit is exceeded, a linking error will appear.

However, even if this is the case, no errors may arise and execution branch to an incorrect address.

### 3. Conditions

This problem arises if the following conditions are all satisfied:

- (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 (see NOTE):
  - jarl
  - jarl22
  - jcond
  - jr
  - jr22

NOTE:

Any of the above may appear in a group of branch instructions generated by function calls, including calls to runtime functions. Here, runtime functions mean the functions to which calls are made as necessary by the compiler; not those by the user.

(3) The branch destination of the branch instruction falls outside one of the following limits:

- 64 MB in CX compiler V1.20 and V1.21
- 128 MB in CX compiler V1.00 through V1.11

Note, however, that this problem does not arise in the V850E2S CPU core because its address space is just 64 MB and does not satisfy the above condition (3).

## 4. Workarounds

To avoid this problem, use either of the following methods depending on the types of instruction string:

### 4.1 For Assembly-Instruction Strings Generated by Compiling C Source File

Use the far jump function (capability) for the functions involved by following these steps (see NOTE):

- (1) Include the names of the functions involved in the file that lists the functions to be called by the far jump function.
- (2) Use the `-Xfar_jump` option to compile the above file.

NOTE:

When the far jump function is used, the `jarl32` or `jr32` instruction is generated at compilation. These instructions enables execution to branch anywhere in the entire 32-bit address space of the V850 MCU, so linking errors do not appear even if the branch destination falls outside a range of +2 MB or -2 MB.

For details of the far jump function, see Article 3.3.3 of the following user's manual:

CubeSuite+ V1.00.00 Integrated Development Environment  
User's Manual: Coding for CX Compiler  
Document No. R20UT0554EJ0100

This can be downloaded from the Web site at [here](#).

### 4.2 For Instruction Strings in Assembly Source File

Rewrite the branch instruction concerned in the assembly source file to

the jarl32 or jr32 instruction.

## 5. Schedule of Fixing Problem

We plan to fix this problem in CubeSuite+ CX Compiler V1.30.

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