CubeSuite+ V850 Compiler CA850 V3.50

Release Note

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Contents

Chapter 1. Target Devices

The target devices supported by the CA850 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+ V1.00.00 V850 Coding	R20UT0553EJ0100
CubeSuite+ V1.00.00 V850 Build	R20UT0557EJ0100
CubeSuite+ V1.00.00 Message	R20UT0407EJ0100

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+ CA850 V3.50".

Chapter 4. Changes

This chapter describes changes of CA850

4.1 Changes of CA850

This section describes changes of CA850 from V3.47 to V3.50.

4.1.1 Supported CubeSuite+

It supported to CubeSuite+.

Chapter 5. Cautions

This section describes cautions for using CA850 V3.50.

5.1 Specification of debug information output option (-g)

The output code varies depending on whether or not the debug information output option -g has been specified.

5.2 Handling of r1 register in interrupt function

The assembler (as850) 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.

5.3 Debug information

When a function is defined using a different source file, and is started or ended with #include, correct debug information cannot be acquired.

In addition, debug information is not output to codes in a file specified by the .include or .binclude quasi directive, codes in a macro defined by the .macro quasi directive, or sections created with the .section quasi directive in an assembler source file.

Chapter 6. Restrictions

This chapter describes the restrictions of the CA850.

6.1 Restrictions of CA850

Below is a list of restrictions of the CA850 V3.50.

No.	Restrictions
6	Restriction on structure type conditional operator for argument of function
7	Restriction on indirect calling of function
8	Restriction on meaningless function definition
12	Restriction on extra ( ) in function declaration
21	Restriction on section allocation
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23	Restriction on section file with tentative definition of external variables of same name in multiple files
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95	Restriction on floating point constants and integral type
96	Restriction on input conversion for I/O function in standard library

6.2 Restrictions on Using V3.50

The following restrictions apply to CA850 V3.50.

No. 4 Restriction on precision during floating-point constant operation

[Description] If a floating-point operation that may be inadvertently executed is described for compilation that involves casting to an integer, the precision drops very slightly, and the value may become illegal as a result of casting to an integer. No problem occurs if a floating point is handled as is.

Example:

```
   (long)(1.12 * 100);
```

[Workaround] Change the above statement as follows.

```
  float  f = 1.12;
  (long)(f * 100);
Or,
  float  f;
  (long)(f = 1.12 * 100);
```

No. 6 Restriction on structure type conditional operator for argument of function

[Description] The correct branch code is not generated if a structure type conditional operator exists in an argument.

Example:

```
  typedef struct {int i;}S;
  S ss1, ss2;
  int j;
  void func(){
          func_call((j>10)?ss1:ss2);
 }
```

[Workaround] Change the above statement to the if statement as follows.

```
  if (j > 10){
        func_call(ss1);
  }else {
        func_call(ss2);
 }
```

No. 7 Restriction on indirect calling of function

[Description] If an expression that indirectly calls a function requires an offset, an internal compiler error occurs.

Message:

```
C2000: internal: gen_binary(): OP_CALL : left-child’s operator is wrong
C5211: syntax error at line <num> in intermediate file
```

Example:

```
struct S {;
        int dummy;
        int func_body[0x100];
} sobj;
void f() {
        ((void(*)())sobj.func_body)();
}
```

[Workaround] Separate an offset calculation expression from a calling expression as follows.

```
void f(){
        void (*fp)() = (void(*)())&sobj.func_body;
        fp();
}
```

No. 8 Restriction on meaningless function definition

[Description] An error is not output for a meaningless function definition.

Example:

```
typedef int INTFN();
INTFN f{return(0);}
```

[Workaround] Avoid the coding that corresponds to this restriction.

No. 12 Restriction on extra ( ) in function declaration

[Description] A syntax error is output for an extra ( ) in a function declaration.

Example:

```
typedef int Int;
void f1((Int));
```

[Workaround] Modify the description as follows.

```
typedef int Int;
void f1(Int);
```

No. 21 Restriction on section allocation

[Description] In the tidata section allocation specification by the #pragma section directive or in “char type array of a structure” or “access to a char type member” specified by sf850 to be located in the tidata section, an error occurs in the linker if the displacement value of the sst instruction or sld instruction used to access the array or member is exceeded.

[Workaround] Implement any of the following workarounds.

(1) Do not use the char member or char array of a structure that causes the error in the linker.

(2) Do not assign the char member or char array of a structure that causes the error in the linker to the tidata section.

No. 22 Restriction on section file with variable entity in assembly source

[Description] In an application where the entity of a variable is in the assembly source and if that variable is referred to on the C source, an error occurs during linking if the section file is generated by sf850.

[Workaround] Delete the variable in the assembly source from the section file.

No. 23 Restriction on section file with tentative definition of external variables of same name in multiple files

[Description] If a section file is generated by sf850 when the tentative definition of external variables of the same name are in two or more files, symbols may be defined in duplicate during linking.

Message:

```
ld850: fatal error: symbol “_xxxx” multiply defined.
```

[Workaround] If two or more tentative definitions of external variables of the same name exist, be sure to declare *extern* in the file that references the external variables.

No. 29 Restriction on specifying optimization option

[Description] If the optimization level of the optimization option specified during compilation is increased, the phases that are executed during compilation (such as the optimization function and compilation function) increase. If the -Ot option is specified, the intermediate file created between these phases increases in size, causing a fatal error in some cases.

[Workaround] Decrease the optimization level (by using -Os) and execute compilation.

No. 30 Restriction on object size at optimization

[Description] When the optimization option is specified, the size of an object file including debug information may significantly increase.

[Workaround] Either lower the optimization level or use the -g option, which outputs the debug information only to the file to be debugged.

No. 31 Restrictions on debugging at optimization

[Description] When the optimization option is specified for debugging the source, the following restrictions apply.

(1) When the value of a variable is referenced, a temporary value in the middle of calculation, not the correct value, may be obtained.

(2) If part of an array, element of a structure, or user-defined pointer variable is assigned to a register, variables may be illegally displayed or modified in the variable window of the debugger.

(3) If part of an array of an automatic variable or an element of structure is not used, the area may be deleted. In this case, variables may be illegally displayed or modified in the variable window of the debugger. The stack may be destroyed when a variable is modified.

[Workaround] There is no workaround.

No. 33 Restriction on address of structure member

[Description] If any of the conditions below apply when structure packing is performed, data access follows the data alignment of the device and the accessed address is masked. As a result, data will be missing or discarded by accessing the address of the structure member.

Conditions:

(1) The device used does not support misalign access

(2) The device used supports misalign access but misalign access is disabled

Example:

```
  struct test {
     char c;          /* offset 0 */
     int  i;          /* offset 1-4 */
  } test;
  int *ip, i;
  void func(){
        i = *ip;    /* Accessed from a masked address */
  }
 void func2(){
    ip = &(test.i);
 }
```

[Workaround] There is no workaround.

No. 34 Restriction on bit field

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

Example:

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

[Workaround] There is no workaround.

No. 40 Restriction on referring to specific symbol and reserved symbol in C source

[Description] Target-specific symbols such as _gp_DATA and reserved symbols such as _stext cannot be referred to in the C source.

[Workaround] Do not use a target-specific symbol and reserved symbol in the C source.

No. 95 Restriction on floating point constants and integral type

[Description] When a floating point type value is converted into a value of the integral type, the range that can be expressed with integer values is the *signed int* or *signed long* type area, but if the value is converted into the *unsigned int* or *unsigned long* type while the range is exceeded, a compile error may result.

E2519: invalid has occurred at compile time.

Example:

```
unsigned int ui = 2147483647.0;           /* OK */
unsigned int ui = 2147483648.0;           /* Error */
```

[Workaround] Use the integer type.

Example:

```
unsigned int ui = 2147483648;
```

No. 96 Restriction on input conversion for I/O function in standard library

[Description] When input conversion processing is performed for *printf*, *sprintf*, *vprintf*, or *vsprintf*, which are I/O functions in the standard library, the precision specified for the conversion specifier “g,G” is incremented by 1.

Example:

```
printf(“%.2g”, 12.3456789);
/* The result should be 12, but 12.3 is output */
```

[Workaround] There is no workaround.

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