
C Compiler Package for RL78 Family

Outline

When using the CC-RL C compiler package for the RL78 family, note the following point.

1. Relational operators in the control expressions of switch statements (CCRL#015)

Note1: The number which follows the description of a precautionary note is an identifying number for the precaution.

Note2: Relational operators include equality operators.

1. Relational Operators in the Control Expressions of switch Statements (CCRL#015)

1.1 Applicable Products

CC-RL V1.00.00 to V1.05.00

1.2 Details

An invalid code may be generated if the control expression of a switch statement is a relational operation or an equality operation.

1.3 Condition

An invalid code may be generated when all of conditions (1) to (5), described below, are met:

- (1) The optimization level other than -Nothing is specified, or the optimization level is not specified.
- (2) The C source code contains a loop statement and the loop statement contains a switch statement.
- (3) The switch statement of (2) is a true/false judgment using $>$, $>=$, $<$, $<=$, $==$, or $!=$ ^(Note 1).
- (4) The members of the relational operator or the equality operator of (3) is a loop control variable and a constant that do not have a volatile qualifier ^(Note 2).
- (5) The switch statement of (2) has two case labels with case values 0 and 1 ^(Note 3).

Note 1: This condition is true if the statement contains a relational operator or an equality operator.

For example, the condition is true for `switch(i != 0)` but not true for `switch(i)`.

Note 2: The right and left members of the operator are interchangeable for the condition to be true; for example, "`i > 1`" and "`1 < i`" are applicable.

Even if a constant is not contained, the condition may be true if the compiler optimization regards a variable as a static constant.

Note 3: The condition is true even if the branch destinations of case 0: and case 1: are the same.

The presence or absence of a default label does not matter.

1.4 Example

The following is an example of the problem.

When the -Onothing option is not designated: Condition (1)

```
unsigned char a;
int main( void )
{
  int i = 0;           /* Condition (4) */
  while(1) {          /* Condition (2) */
    switch( i < 1 ){  /* Condition (2) (3) (4) */
      case 1 :        /* Condition (5) */
        a = 20;
        break ;
      case 0 :        /* Condition (5) */
        goto end_1 ;
        break ;
    } ;
    i++ ;
  }
end_1:
  return( 0 ) ;
}
```

In the above example, case 1 of the switch statement is executed when i equals 0, but the output code does not set a to 20.

1.5 Workaround

To avoid this problem, take any of the following steps:

- (1) Specify the optimization level option as -Onothing.
- (2) Replace the switch statement of condition (2) with an if statement.
- (3) Modify the loop control variable in Condition (4) by adding the volatile qualifier.

1.6 Schedule for Fixing the Problem

The problem had been fixed in CC-RL V1.06.00.

Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Jul. 1, 2017	-	First edition issued
1.01	Jan.16, 2021	1	1.1 Applicable Products(V1.04.00 -> V1.05.00)
1.01	Jan.16, 2021	2	1.6 Schedule for Fixing the Problem(V1.05.00 -> V1.06.00)

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