

A Note on Using the M3T-NC30WA C-Compiler Package --On an Arithmetic Operation between Two unsigned-Type Variables in a Controlling Expression--

Please take note of the following problem in using the M3T-NC30WA C-compiler package:

- On an arithmetic operation between two unsigned-type variables in a controlling expression
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1. Versions Concerned

M3T-NC30WA V.5.00 Release 1 through V.5.30 Release 02

(This C compiler package is used for the M16C/60, M16C/30, M16C/20, M16C/10, M16C/Tiny, and R8C/Tiny series of MCUs.)

2. Description

If the result of an arithmetic operation between two unsigned-type variables is compared with zero in the controlling expression of an controlling statement (if, while, do, etc.), incorrect code may be generated.

2.1 Conditions

This problem occurs if the following conditions are all satisfied:

- (1) An arithmetic operation between two unsigned-type variables is performed in the controlling expression of a controlling statement (any of the selection, iteration, and jump statements). Here the combinations of unsigned-type variables are as follows:
 - two variables of type unsigned int
 - two variables of type unsigned char
 - a variable of type unsigned int and that of type unsigned char

- (2) The result of the operation in (1) itself is compared with zero.
- (3) The comparison in (2) is made using the $>$ or $<=$ relational operator.

2.2 Example

```
-----  
unsigned int a,b;
```

```
if(a-b > 0)  
    i = 1;  
else  
    i = -1;  
-----
```

3. Workaround

Compare the result of the operation with zero as follows:

- (1) If the $>$ relational operator used, replace it with $!=$.

Example:

```
-----  
-----  
unsigned int a,b;  
  
if( (a - b) != 0)  
    i = 1;  
else  
    i = -1;  
-----  
-----
```

- (2) If the $<=$ relational operator used, replace it with $==$.

Example:

```
-----  
-----  
unsigned int a,b;  
  
if( (a - b) == 0)
```

```
    i = 1;  
else  
    i = -1;
```


4. **Schedule of Fixing the Problem**

We plan to fix this problem in the next release of the product.

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