

===== Be sure to read this note. =====

Integrated C Compiler for M32C/80, M16C/80 Series  
**M3T-NC308WA V.5.20 Release 1**

Release note [Entry Version]  
 (Rev.1.0)

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**Abstract**

Welcome to M3T-NC308WA V.5.20 Release 1 (Entry Version). This document contains supplementary descriptions to User's Manual. When you read certain items in the User's Manual, please read this document as well.

Also, this document contains a License Agreement in the last. Please read it before using. By using the software, you are accepting and agreeing such terms.

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## 1. The CD-ROM contains

### 1.1. The CD-ROM contains

- M3T-NC308WA V.5.20 Release 1 (Entry version)
- M3T-NC308WA V.5.20 Release 1's Release Note (PDF format file [this book])
- NC308's Electric manual (PDF format file)
- AS308's Electric manual (PDF format file)
- HEW (Integrated development environment)
- TM (Integrated development environment)
- TM's Electric manual (PDF format file)
- GNU utility

## 2. About this product

### 2.1. About customer support

The Entry Version is **not to be supported and warranted**. Accordingly, for the directions for use of Entry Version or the like, you can not apply to our company. If you inform us of any idea that may flash upon your mind and your comments, if any, we are ready to take up your suggestions and hints for future improvements. However, please take note that we may not give our reply to you as to your idea.

### 2.2. About “-fansi” option

In this Entry Version, the compiler always considers that the -fansi option was specified at compiling. Therefore, the option of the following always becomes effective.

option	contents
-fextend_to_int (-fETI)	Perform Integral Promotion
-fnot_reserve_asm (-fNRA)	Exclude asm from reserved words
-fnot_reserve_far_and_near (-fNRFAN)	Exclude far and near from reserved words
-fnot_reserve_inline (-fNRI)	Exclude inline from reserved words

### 2.3. About describing of a program

If you describe the following words, append underscore(\_) before the word, please.

- inline
- near
- far
- asm()

### 2.4. About NC308 and AS308 options

You can not use the following options.

- C Compiler (NC308)

Options for Debugging	-genter -gno_reg
Optimization options	-O[1-5], -OR, -OS -Oconst (-OC) -Ocompare_byte_to_word (-OCBTW) -Ofloat_to_inline (-OFTI) -Ofoward_function_to_inline (-OFFTI) -Oglb_jump (-OGJ) -Ono_bit (-ONB) -Ono_break_source_debug (-ONBSD) -Ono_float_const_fold (-ONFCF)-Ono_stdlib (-ONS) -Osp_adjust (-OSA) -Oloop_unroll (-OLU)

	-Ono_asmopt (-ONA) -Ono_logical_or_combine (-ONLOC) -Ono_float_const_fold (-ONFCF) -Ono_stdlib (-ONS) -Ostatic_to_function (-OSTF)
Code generation options	-fansi -finfo,-fuse_DIV (-fUD) -fdouble_32(-fD32) -fnear_ROM (-fNROM) -fsmall_array (-fSA) -fno_align (-fNA) -fnear_pointer (-fNP)
Warning options	-Wno_used_function (-WNUF) -Wno_used_static_function (-WNUSF)
Assemble and Link options	-as308, -ln308

- Assembler (AS308)

Options	-finfo -JOPT -mode60p -M
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## 2.5. [About software tools and utilities](#)

You can not use the following tools and utilities.

- STK Viewer (Include STK Utility)
- Map Viewer
- utl308 (The SBDATA declaration and Special Page Function declaration utility)
- aopt308 (Assemble optimizer)
- lb308 (Librarian)
- pre30 (Structured preprocessor for assembler)
- Standard library source files

### 3. Precautions on Product

Please observe the following precautions before using the M3T-NC308WA.

#### 3.1. Precautions about NC308

##### 3.1.1. Precautions about the search of an include file

If you give a file to include together with a drive name in the #include line, and attempt to compile the file from a directory different from the one in which the file to compile is present, instances may occur in which the file to include cannot be searched.

##### 3.1.2. Precautions to be taken when using #pragma ASM/ENDASM and asm()

- Regarding debug information when using #pragma ASM outside functions, if you write #pragma ASM anywhere outside functions, no C source line information will be output. For this reason, information regarding descriptions in #pragma ASM to #pragma ENDASM, such as error message lines when assembling or linking and line information when debugging, may not be output normally.
- C compilers generate code of arguments to be passed via registers and of register variables by analyzing their scopes. However, if manipulations of register values are described using inline assemble functions (such as #pragma ASM / #pragma ENDASM directives and asm function), C compilers cannot hold information on the scopes of the above-mentioned arguments and register variables. So, be sure to save and recover register contents on and from the stack when registers are loaded using inline assemble functions described above.

##### 3.1.3. Precautions about debugging of a program using \_Bool type

When you debug the program which uses the BOOL type, please confirm whether the debugger is supporting the BOOL type.

In using the debugger which is not supporting the BOOL type, please use a debugging option“-gbool\_to\_char (-gBTC)” at the time of compile.

##### 3.1.4. Precautions regarding the preprocessing directive #define

To define a macro which will be made the same value as the macro ULONG\_MAX, always be sure to add the prefix UL.

#### 3.2. Precaution of MCU-Dependent Code

##### 3.2.1. M16Precautions regarding the M16C interrupt control register

When the “-O5” optimizing option is used, the compiler generates in some cases BTSTC or BTSTS bit manipulation instructions. In M16C, the BTSTC and BTSTS bit manipulation instructions are prohibited from rewriting the contents of the interrupt control registers. However, the compiler does not recognize the type of any register, so, should BTSTC or BTSTS instructions be generated for interrupt control registers, the assembled program will be different from the one you intend to develop. For detailed information about this, see below "Precautions for Interrupts" Described in Related Documents (Excerpts).

When using any of the products concerned, ensure that no incorrect code is generated.

- Example

When the -O5 optimizing option is used in the program shown below, a BTSTC instruction is generated at compilation, which prevents an interrupt request bit from being processed correctly, resulting in the assembled program performing improper operations.

```
#pragma ADDRESS TA0IC 006ch // M16C/80 MCU's Timer A0 interrupt control register
struct {
    char    ILVL : 3;
    char    IR   : 1; // An interrupt request bit
    char    dmy : 4;
} TA0IC;

void WaitUntillRisON(void)
{
```

```

while( TA0IC.IR == 0)           // Waits for TA0IC.IR to become 1
{
    ;
}                               // Returns 0 to TA0IC.IR when is become 1
}

```

- Workaround

- (1) Suppress the generation of the BTSTC and BTSTS instructions resulting from using an optimizing option by selecting the -ONA (or -Ono\_asmopt) option together with "-O5" optimizing option.
- (2) Add an asm function to disable optimization locally, as shown in the example below.

```

while( TA0IC.IR == 0 )
{
    asm();
}

```

- Notes

Make sure that no BTSTC and BTSTS instructions are generated after these side-steppings.

### 3.2.2. Precautions about access of SFR area

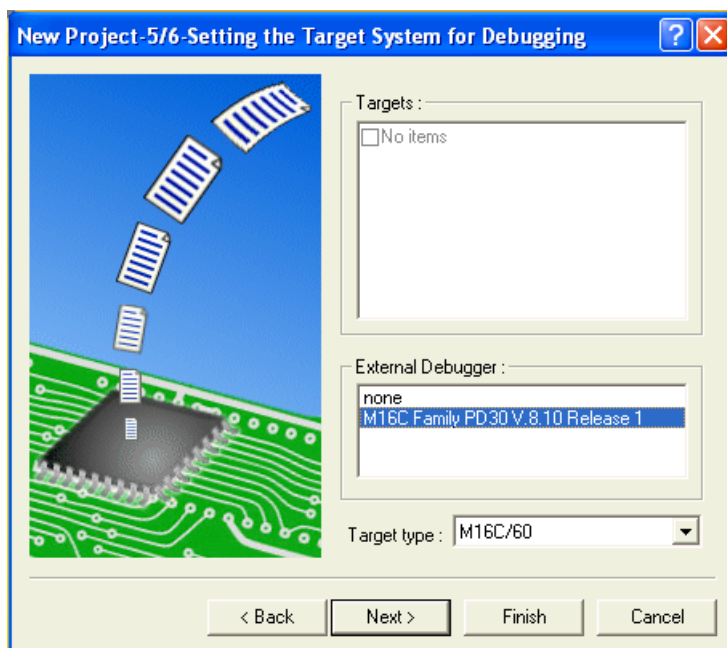
You may need to use specific instructions when writing to or reading registers in the SFR area. Because the specific instruction is different for each model, see the User's Manual for the specific Machine. These instructions should be used in your program using the asm function.

## 3.3. Precautions about HEW

### 3.3.1. Using the PDxx Debugger

When you use the following debuggers, please choose the debugger used at the time of work space new creation.

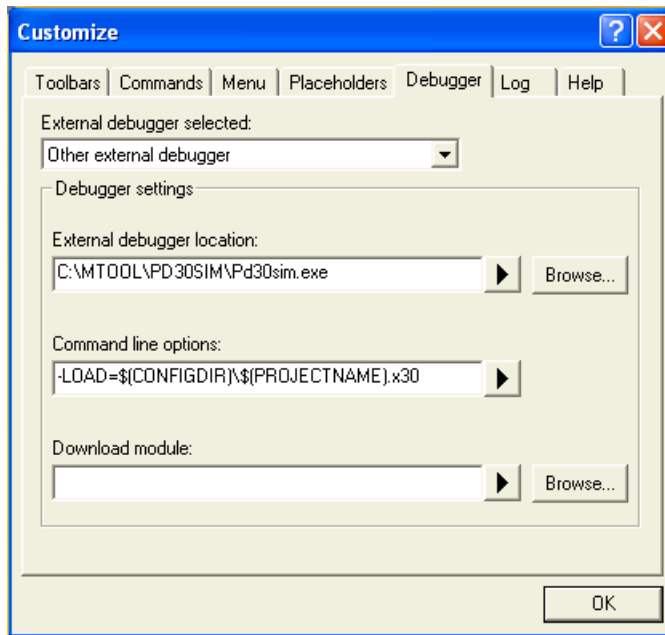
PD308	V.5.10 or later
PD308F	V.3.10 or later



How to register a debugger of which version is former than the above debuggers is following.

- (1) Select menu [Tool->Customize...].
- (2) Select "Debugger" tab on the Customize dialog box.
- (3) Select "other external debugger" for the [External debugger selected].
- (4) Specify the location of the executable file PDxx.exe for the [External debugger location].
- (5) Input "-LOAD=\${CONFIGDIR}\¥\$(WORKSPNAME).x30" to the [Command line options].

The following is an example for the setting.



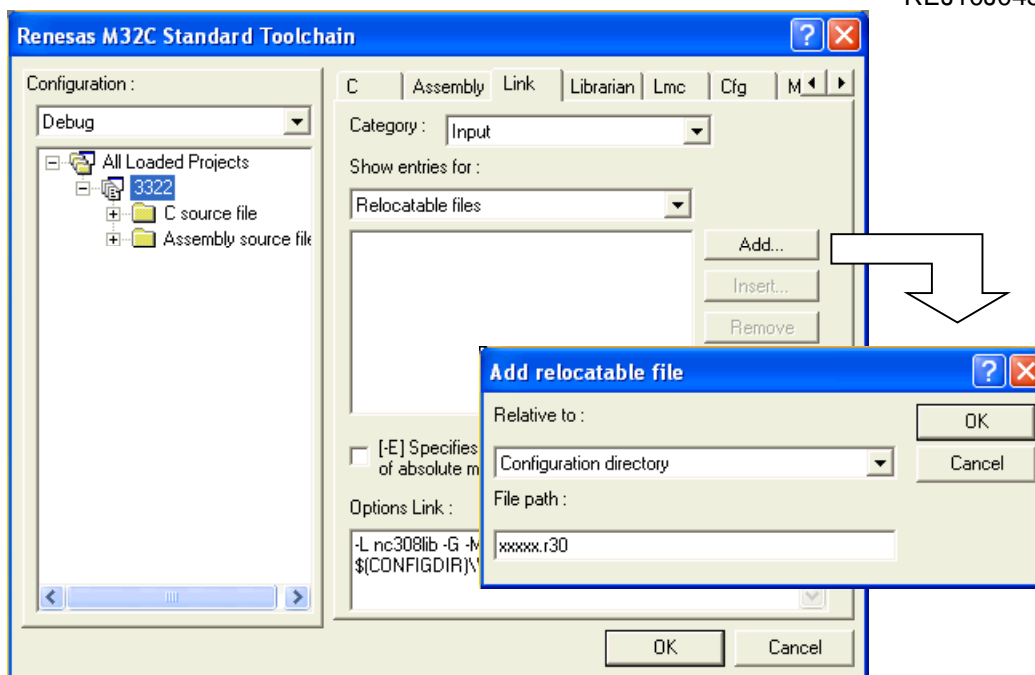
### 3.3.2. Start-up program is linked to a head.

If a default start-up program (ncrt0.a30) is specified when work space creates, this file is automatically linked to a head.

### 3.3.3. User defined start-up program is linked to a head

When user defined start-up program (without "ncrt0.a30") is linked to a head, please set up HEW in the following procedure.

- (1) From the menu, click [Options] -> [Renesas M16C Standard Toolchain...]. (This opens [Renesas M16C Standard Toolchain] dialog..)
- (2) Click [Link] tab.
- (3) Select [Input] from the [Category:].
- (4) Select [Relocatable files] from [Show entries for:].
- (5) Click [Add] button. (This opens [Add Relocatable files] dialog..)
- (6) Select [Configuration directory] from [Relative to:].
- (7) Input [ncrt0.r30] to [File path:].
- (8) Click OK button in [Add Relocatable files] dialog..
- (9) Click OK button in [Renesas M16C Standard Toolchain] dialog.



### 3.4. Precautions about TM

- As for integrated development environment TM, use Version 3.00 or a later version. M3T-NC308WA in this version cannot be used in Version 2.01 or in an earlier version. So be careful.
- In an attempt to divert a project generated by TM V.2 for TM V.3, the `-finfo` option is not turned effective either in compiling or in assembling. Choose `-finfo` separately. For details, see the Release note of TM V.3.

### 3.5. Precautions about the MS-Windows version

#### 3.5.1. Precautions about environment of operation

- (1) The MS-Windows version operates under Windows 95, Windows 98, Windows NT 4.0 or later. It does not work under Windows 3.1 and Windows NT 3.5x or earlier.
- (2) If in Windows NT environment the command prompt size is set to other than "80 x 25," the command prompt size will change frequently as you start the compiler. Make sure the command prompt size is set to "80 x 25."

#### 3.5.2. Suggestions Concerning File Names

The file names that can be specified are subject to the following restrictions:

- Directory and file names that contain kanji cannot be used.
- Only one period (.) can be used in a file name.
- Network path names cannot be used. Assign the path to a drive name.
- Keyboard shortcuts cannot be used.
- Directory and file names that contain a space character cannot be used.
- The "..." symbol cannot be used as a means of specifying two or more directories.
- A file name in length of 128 characters or more including path specification cannot be used.

#### 3.5.3. Precautions about virus check programs

If the virus check program is memory-resident in your computer, M3T-NC308WA may not start up normally. In such a case, remove the virus check program from memory before you start M3T-NC308WA.

#### 3.5.4. Precautions when upgrading

To upgrade M3T-NC308WA, uninstall the currently installed M3T-NC308WA first before you install the new version.

- Procedure for uninstalling M3T-NC308WA  
To uninstall M3T-NC308WA, launch Add/Remove Programs in Control Panel and then execute Uninstall.

## 4. Installing M3T-NC308WA

### 4.1. Before installing M3T-NC308WA

Please confirm as follows before installing M3T-NC308WA in your computer.

- Please carefully read the "License Agreement" and "Release Note" included with your product before using M3T-NC308WA. If you've installed this product in your computer, it is assumed that you've agreed to the provisions stipulated in the License Agreement.
- In order that M3T-NC308WA operates comfortably, it requires at least 32Mbytes of memory and a hard disk having 20Mbytes or more of space.
- Use the dedicated installer to install M3T-NC308WA.
- You need to input a license ID in the middle of installation. Before you start installing M3T-NC308WA, check your license ID.

### 4.2. Precaution about installing this product

- When installing this product in a computer, the integrated development environment HEW (High-performance Embedded Workshop) is also installed together with a compiler.
- When the following dialog is outputted during installation, please choose "*it is all yes*."

[Dialog message]

The following file is already on your computer.

C:\WINDOWS\TEMP\...

Do you wish to overwrite this file?

:

### 4.3. M3T-NC308WA Installer

The installer is provided for each of the environments (supported host, supported OS and language) listed below. Check the product you've purchased to find the appropriate installer.

- Japanese environment

Supported host	Supported OS	Installer name	Directory on CD-ROM
IBM <sup>1</sup> PC/AT compatible	Microsoft Windows <sup>2</sup> 98 Microsoft Windows Me Microsoft Windows NT Microsoft Windows 2000 Microsoft Windows XP	SETUP.EXE	\NC308WA\W95J

- English environment

Supported host	Supported OS	Installer name	Directory on CD-ROM
IBM PC/AT compatible	Microsoft Windows 98 Microsoft Windows Me Microsoft Windows NT Microsoft Windows 2000 Microsoft Windows XP	SETUP.EXE	\NC308WA\W95E

### 4.4. Installing MS-Windows version

Please install the MS-Windows version in the following procedure.

- (1) Go to the directory corresponding to your system, which can be found the name of the software you purchased, on the CD-ROM.
- (2) Start up the installer and follow the messages displayed on the screen as you install M3T-NC308WA.

### 4.5. Setting environment after installation

The environment variables marked by "Auto" in the tables below do not need to be set because the Windows

<sup>1</sup> IBM and AT are registered trademarks of International Business Machines Corporation.

<sup>2</sup> Microsoft, Windows, and Windows NT are registered trademarks of Microsoft Corporation in the U.S. and other countries.

installer automatically rewrites AUTOEXEC.BAT.

Environment variable	Example of setting
BIN308	Auto (SET BIN308=C:¥MTOOLENT¥BIN)
INC308	Auto (SET INC308=C:¥MTOOLENT¥INC308)
LIB308	Auto (SET LIB308=C:¥MTOOLENT¥LIB308)
TMP308	Auto (SET TMP308=C:¥MTOOLENT¥TMP)
NCKIN	SET NCKIN=SJIS
NCKOUT	SET NCKOUT=SJIS
Command path	Auto (C:¥MTOOLENT¥BIN is added)

## 5. Software version list of M3T-NC308WA V.5.20 Release 1 (Entry Version)

The following lists the software items and their versions include with M3T-NC308WA V.5.20 Release 1 (Entry Version).

- nc308 V.1.05.03 Entry
- cpp308 V.4.05.03
- ccom308 V.5.02.05
- as308 V.4.00.00
- mac308 V.2.20.00
- asp308 V.4.00.00
- ln308 V.4.00.01
- lmc308 V.3.00.00
- xrf308 V.2.01.00
- abs308 V.1.02.00

## 6. Versions Useful for the Real-time OS M3T-MR308K and M3T-MR308S

The M3T-NC308WA compiler presented here supports the real-time OS M3T-MR308K V.1.10 Release 1A and M3T-MR308S V.1.10 Release 1A. When you are using M3T-MR308K or M3T-MR308S in combination with the M3T-NC308WA compiler, please be sure to use the above compiler version.