

CUSTOMER NOTIFICATION

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V850E/IA2 Device File

DF703114 (V1.00)

User's Manual

[Supported machines/OS]
PC-9800 Series (Windows™)
IBM PC/AT™ Compatibles (Windows)
SPARCstation Family (SunOS™/Solaris™)

Be sure to read this document before using the product.

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1. OUTLINE

A device file is a binary file that contains device-dependent information and is prepared for each device model or for each product in the same series.

Device files are commonly used with development tools (such as compilers and debuggers). Employing device files enables generation and debugging of device-unique codes. In addition, when developing applications, device files enable the SFR names unique to the device being used to can be used for programming.

This product (DF703114) contains device files necessary for developing applications using the V850 Family V850E/IA2¹.

2. CONTENTS OF PACKAGE

The device files included in this product and the corresponding devices are as follows:

Table 2-1. Contents of Package

Types	Device File Name	Corresponding Device Name	Model Specification Name
Device file	D3114.800	uPD703114	3114
	DF3114.800	uPD70F3114	F3114
Database file	S3114.800, SF3114.800		

The “model specification name” is used as the character string specified with the CA850 compile option “-cpu”, the “#pragma cpu directive” in source programs, and the “.option pseudo-instruction”. The names are not case sensitive.

The database file is a file required when using the SM850 (system simulator). This file is also included with the SM850. The installation of this file can be selected when installing the device file or the SM850.

It is recommended to use the latest version of the database file. If this file already exists when the V850 is being installed using a device file installer, you are asked if you want to overwrite the file. At this time, confirm the time stamp and make sure that the file being installed is the latest version (note, however, that this file is always overwritten when installing the SM850).

The file is not necessary when using the ID850. Therefore, you don't have to install this file.

¹ V800 Series, V850 Family, and V850E/IA2 are trademarks of NEC Corporation.

3. USER ENVIRONMENT

Like development tools, device files are available for both Windows² and UNIX³. Please use the device files that match your development environment.

User environment for device files:

Machine	Operating System
PC-98 series, IBM PC/AT compatible machines	Microsoft™ Windows 95
	Microsoft Windows 98
	Microsoft Windows NT™ 4.0
	Microsoft Windows 2000
SPARCstation	SunOS 4.1.4 and above/Solaris 2.5.1

If using Windows 95, Windows 98, Windows NT 4.0, or Windows 2000, an expansion memory of at least 8 MB is required.

4. CORRESPONDING VERSIONS OF DEVELOPMENT TOOLS

The corresponding versions of the DF703114 and V850 Family™ development tools made by NEC are shown below. Use these tools in the following combinations.

Tool Used	Version of Corresponding Tool
CA850 C compiler package	CA850 V2.40 and later
ID850 Integrated debugger	ID850 V2.40 and later
SM850 System simulator	SM850 V2.40 and later

² Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

³ UNIX is a registered trademark licensed by X/Open Company Limited in the US and other countries.

Other company and product names that appear in this manual are trademarks or registered trademarks of their respective owners.

5. INSTALLATION

5.1 On a Windows Platform

Device files are included on one floppy disk^{Note} and can be installed with either of the two methods below.

- (1) Use the device file installer (DFINST) included in the NEC development tools (CA850, ID850, and SM850).
- (2) Use the installation command SETUP_E.EXE included in the floppy disk.

Use method 1 when using the NEC development tools and method 2 if you are not using the NEC development tools. Specific installation procedures are described below.

Note A self-extraction file (an execution file) is downloaded along with device files with ODS (on-line delivery service). If this file is executed, a disk image is created. Copy this to hard disk or to a floppy disk and then begin the installation process.

5.1.1 Using the device file installer (DFINST)

Start the device file installer (DFINST) and install the device files.

For information on Windows operation, please refer to the user's manual published by Microsoft Corporation that accompanies your Windows operating system.

- (1) Start Windows.
- (2) Start the device file installer (DFINST). If the NEC development tool has been installed in the standard directory, the device file installer will be in *installed drive*\Nectools32\bin.
- (3) If installing from the floppy disk, insert the floppy disk in the floppy disk drive.
- (4) Click the button.
- (5) If installing from the floppy disk, use the button to display the path where the disk image (icon) is located. Use the button to do this if installing from hard disk.
- (6) Necsetup.ini file and _csetup.ini file are displayed in the file list of the dialog box that appears after step (5). Select _csetup.ini to install the English version and Necsetup.ini to install the Japanese version.
- (7) Please refer to the device file installer chapter of the CA850 User's Manual Project Manager (Windows Base) for subsequent installation procedures.

5.1.2 Using the installation command

Install the device files by following the instructions of the SETUP_E.EXE installation command. The standard directory for device files is :\nectools\dev on the drive in which Windows is installed.

For information on Windows operation, please refer to the user's manual published by Microsoft Corporation that accompanies your Windows operating systems.

- (1) Start Windows.
- (2) Execute the SETUP_E.EXE command in the root directory of the floppy disk provided from the Explorer.
- (3) Install the device files by following the SETUP_E.EXE instructions.

Caution When installing DF703114 using this installation command, a folder name longer than eight characters cannot be specified as the installation folder.

5.2 On a UNIX Platform

The device files are included in either a cartridge magnetic tape (CGMT) or a floppy disk. In both cases, the device files are stored in UNIX command tar format. The method for reading from CGMT or floppy disk is explained below.

5.2.1 Installing from CGMT

Device files are stored on one CGMT.

- (1) Login to the host machine.
- (2) Go to the install directory. The install directory in this case is `/usr/local/necools32/dev`.

```
% cd/usr/local/necools32/dev
```

- (3) Set the CGMT in the cartridge slot.
- (4) Execute the tar command to read the device files from the CGMT.

```
% tar xvof /dev/rst8 4
```

5.2.2 Installing from FD

Device files are stored on one floppy disk.

- (1) Login to the host machine.
- (2) Go to the install directory. The install directory in this case is `/usr/local/necools32/dev`.

```
% cd/usr/local/necools32/dev
```

- (3) Set the floppy disk in the floppy disk drive.
- (4) Execute the tar command to read the device files from the floppy disk.

```
% tar xvof /dev/rfd0c 5
```

⁴ This is a special file name that indicates a UNIX operating system CGMT device. The special file used will depend on the density of the data when stored on the CGMT. For further information refer to the user's manual of the host machine or contact the system manager.

⁵ This is a special file name that indicates a UNIX operating system floppy disk drive. The special file used will depend on the density of the data stored on the CGMT. For further information refer to the user's manual of the host machine or contact the system manager.

6. USAGE

6.1 Using the Project Manager

The project manager specifies the device names used when entering project settings. Select "V850 Family" (V850 Family Library when creating a library) for the series name and the device used as the device name. The specified device name will then be displayed in the dropdown list based on the installed device file.

6.2 Using a C Compiler Package

6.2.1 How to specify the device

When creating an object using CA850, one of the following three methods can be used to specify the target device. At this time, use the model specification name in **Table 2-1 Contents of Package** when specifying the target device with the method described below. The names are not case sensitive. Examples are shown below:

1) ca850/as850/ld850 -cpu options

Example ca850 -cpu f3114 file.c

2) "#pragma cpu" directive in C source program

Example #pragma cpu f3114

3) ".option" pseudo-instruction in assembly language source program

Example .option cpu f3114

When using the Project Manager, the device name specified when project was created is reflected in "1" above. Therefore you don't have to take it into consideration.

6.2.2 Accessing to peripheral I/O

Either the symbol (P1, PM1, etc.) or the bit name (P0MK4, PST01, etc.) can be specified when declaring the "#pragma ioreg" directive in a C source program, or when accessing peripheral I/O registers and flag bits by using the ld/st instructions, or bit operation instructions in an assembly language source program. For details of the symbols and bit names, refer to **V850E/IA2 32-/16-Bit Single-Chip Microcontroller User's Manual - Hardware**.

6.2.3 Specification of interrupt handlers

The interrupt name (NMI0, INTP0, etc.) can be specified when declaring an interrupt handler with the “#pragma interrupt” directive in the C source program or “.section” pseudo-instruction in the assembly language source program.

Example of interrupt handler specification

```
#pragma interrupt NMI0 funcname
__interrupt
void func1 (void){
    :
}
```

In the case of a trap (software exception), however, there are two entry points. Therefore, the interrupt request names that can be specified with the C source program are TRAP0 and TRAP1 only. The interrupt request names that can be specified with the assembler source program are TRAP00 and TRAP10 only. Do not specify an interrupt request name (TRAP00, TRAP1A, etc.).

Example of trap specification in the C source program

```
#pragma interrupt TRAP0 funcname
```

Example of trap specification in the assembler source program

```
.section "TRAP00", text
```

Moreover, “RESET” interrupt cannot be specified with C. Therefore, specify it as follows with assembler source.

Example of RESET interrupt specification

```
.section "RESET", text
jr __start
```

6.2.4 Memory allocation

Memory information for each device is included in the device files. The link editor (ld850) included in the C compiler package assigns each section/segment to memory in accordance with the device file information if the address value is not specified with a link directive.

When a link directive file is not created by the user, the default link directive of ld850 allocates memory assuming that there is both internal ROM and external memory. To specify the ROMless mode, therefore, the user has to create a link directive file and specify relevant addresses to allocate the external memory of the target system. For details of the link directive specification, refer to **CA850 User's Manual – Operation**.

6.3 Using a Debugger

6.3.1 How to specify the device

With the ID850/SM850, the CPU name used is specified in the Configuration dialog box that is opened at startup. At this time, the specified CPU name will be displayed in the dropdown list based on the installed device file.

6.3.2 External memory allocation

With the ID850/SM850, memory mapping is specified in the Configuration dialog box that is opened at startup. When memory mapping is not specified (default setting), it is assumed that an external memory is not used.

When an external memory is used with V850E/IA2 and debugging is performed with the ID850, it is necessary to set the following registers before downloading the load modules.

- PMCDL register
- PMCDH register
- PMCCT register
- PMCCM register

After the settings in the Configuration dialog box have been completed, select “Browse” → “I/O register” on the menu, and write appropriate values to the above registers. It is not necessary to write values to these registers when using the SM850. For details of the settings, refer to **V850E/IA2 32-/16-Bit Single-Chip Microcontroller User's Manual – Hardware**. For the operation of the ID850 and SM850, refer to the **ID850 User's Manual – Operation** and **SM850 User's Manual – Operation**.

7. RELATED DOCUMENTS

The documents related to this product (DF703114) are listed below.

User's Manuals
V850E/IA2 - Hardware
V850E1 - Architecture
CA850 C Compiler Package - Operation
CA850 C Compiler Package - C Language
CA850 C Compiler Package - Assembly Language
CA850 C Compiler Package - Project Manager
ID850 User's Manual - Operation
SM850 User's Manual - Operation
V800 Series Development Tools Tutorial Guide (Windows Base)

8. REVISION HISTORY

8.1 V1.00

(1) First edition