How to Install the MARC4 Software Development System

**MARC4
4-bit Micro-
controllers**

**Emulator
Installation
Description**

Installation

winIDEA Software Installation

Atmel's emulator kit includes the emulator hardware, an Atmel CD-ROM with the emu-lator software from iSystem™ (www.isystem.com) called *winIDEA*™, a POD (i.e. board), cables, etc.

This report describes how the software installation and the MARC4 settings are carried out. First, the installation of the software included in the kit must be done. If on the PC where the software needs to be installed, **autorun** mode is selected, the *SETUP* program starts automatically, otherwise, you have to start the program *MSETUP.EXE*.

Installation of the *winIDEA* Update

Please note that software updates are available from iSystem, and that the update needs to be installed when the main software installation has been completed.

To install the software *Update winIDEA,* start the *.EXE-file* in the directory *winidea* on the Atmel CD. If the PC's operating system is Windows® 95, it could be necessary to run the file *W95ws2setup.EXE*. In the case of the operating systems Windows NT®, Windows® 2000 or Windows® XP, the user must have administrator privileges to successfully install the communication driver.

Installation of a MARC4-specific Workspace

The software development system from iSystem is very flexible and can therefore be used for a broad range of microcontrollers. The user has to modify the settings according to the processor used in several menus of the software. To simplify the han-dling for the developer, the development system works with workspaces, where the windows and hardware settings are saved. A sample project is included on the Atmel CD. Please copy the contents from the directory *qForth* to a subdirectory called *M4-appl* were the development system is installed. In this sample project, all necessary settings for software development with the MARC4 are made.

Starting the Emulator

Hardware

1. Connect the iSystem emulator ic1000 with the enclosed cable (1:1) to the PC's parallel port (LPT).

   Note: ECP port types are not supported. Make sure to use a compatible or bi-directional mode port. Also ensure that no other device is attached to this port (like dongles, etc.).

2. The MARC4 POD must be connected to the emulator box with the three ribbon cables. The shortest and lowest cable must be connected to the outer connector on the POD, the longest and upper cable must be connected to the inner connector on the POD.

3. The Target Adapter Board (TAB) must be connected to the POD via the VG 96 connector. Take care that the VG 96 connector on the TAB is on the side of the MARC4 POD. On the other side of the Target Adapter Board, there is a VG 64 connector for the customer application board.

4. After connecting all boards in the way described, switch on the power of the emulator. During power-up, the red LED *RUN* of the iC1000 emulator and all LEDs on the POD will flash twice. When this is done, the TAB's power supply may be switched on if necessary.

   Note: This second power supply is only needed if the power consumption of the application board exceeds 130 mA.

Software

After successful installation of the hard- and software, the software can be started by selecting *winIDEA App Group/winIDEA* in the Program menu.

1. Select *Tools -> Hardware Plug-IN -> iSystem Development Tools*.

2. Then, open the example with F*ile/Open Workspace,* change the directory to *drive:\winidea\m4-appl\example* and select the file *worksp*.

3. When this is done, select *Hardware Configuration,* and there, the menu item *Hardware Type.*

   A new window with the tabs *Hardware Type*, *License* and *Communication* appears.

4. In the tab *Hardware Type,* select under the headline *Hardware* the item *iC1000* and under *Debugging* the item *In-Circuit Emulation* (see Figure 1 on page 3).

Figure 1. Selected Emulator Hardware
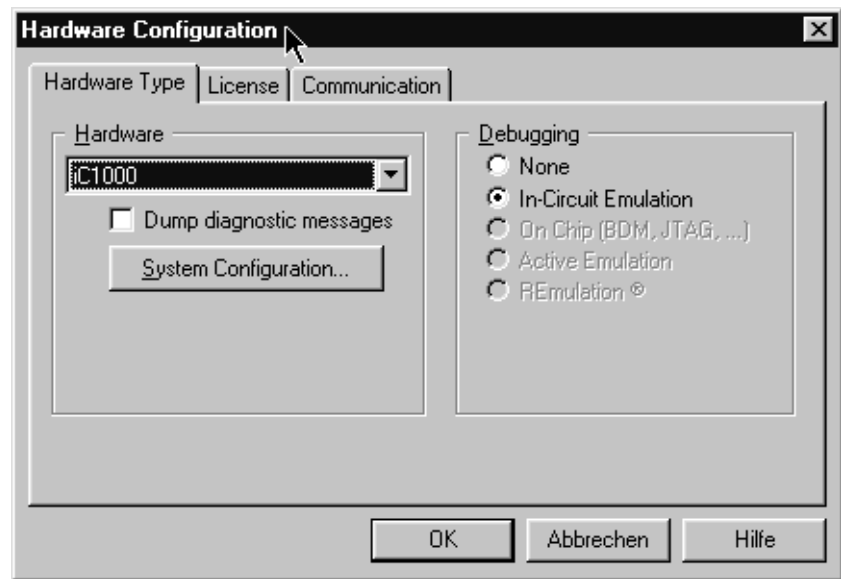
5. Go to the tab *Communication* and select that port where the emulator is connected to the PC.

6. Clicking on the button *Test* will test the connection. A new window appears, which shows the status of the connection.

Figure 2. Communication Test
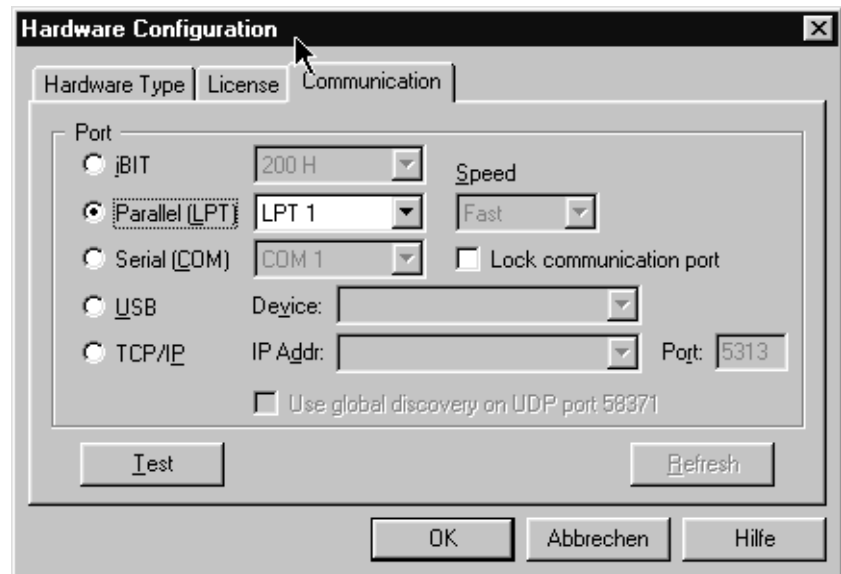
If the software was able to establish a connection to the emulator, the message *Communication ok .....* appears.

If an error message appears, check first if the right port has been selected.

If the port setting is correct and the error message still appears, check the settings for the port in the Bios. The right setting is *Standard* or *Normal*. The software does not support the settings *EPP* and *ECP*.

If these settings are also correct and the error message still appears (Windows NT system), start the batchfile *Install.bat* in the subdirectory *NTComDrv*. The best way to do this is to first start a DOS-Box and then run the batchfile. Now, the messages during the batchfile execution can be read. To install this driver, it may be necessary to have administrator rights.

7. The tab *License* shows the serial number, which is needed for the registration. Fill out the enclosed registration form to get the Init String from iSystem. This Init String must be entered in the *License* tab.

Figure 3. Entering the Emulator License
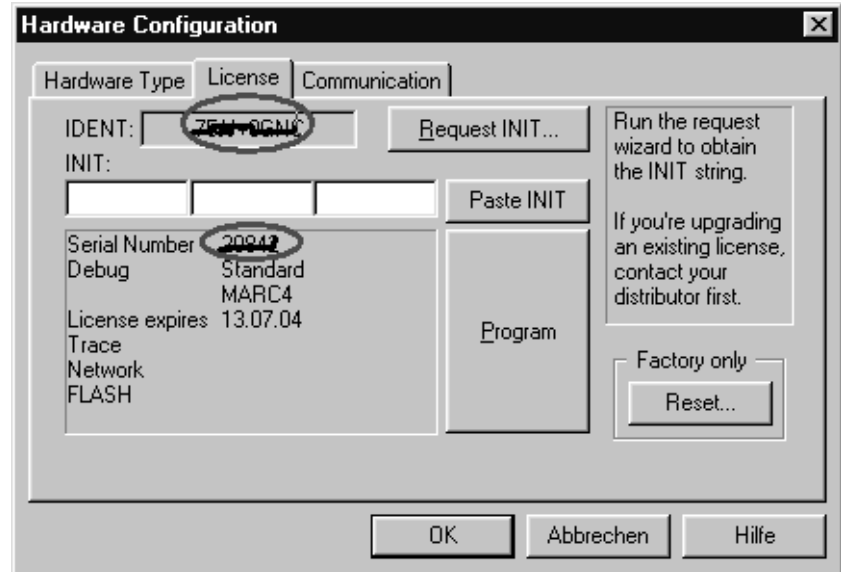
Starting a New Project

The easiest way to start a new project is to save an existing workspace to a new subdirectory by using the menu item *Workspace save as.* In this new subdirectory, the new source code will be placed. The new project can now be opened by clicking on *Open Workspace*.

The new project, however, still contains the source code of the previous project. This old source code can be removed with the command *Close*. After having created a new file with *New,* the software can be written. Before the compilation can be used, some parameters in the menu *Project* have to be changed.

Menu Item *Project Files*

In the lower part of the window, there is an area called *Files in Group*. Delete the old file with *Remove*. Set the path to the new subdirectory, and mark the new source code in the left part of the window and click on *Add*. Now, the name of the new source code is shown in *Files in Group* (see Figure 4 on page 5).

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**Figure 4.** Selected Project Files
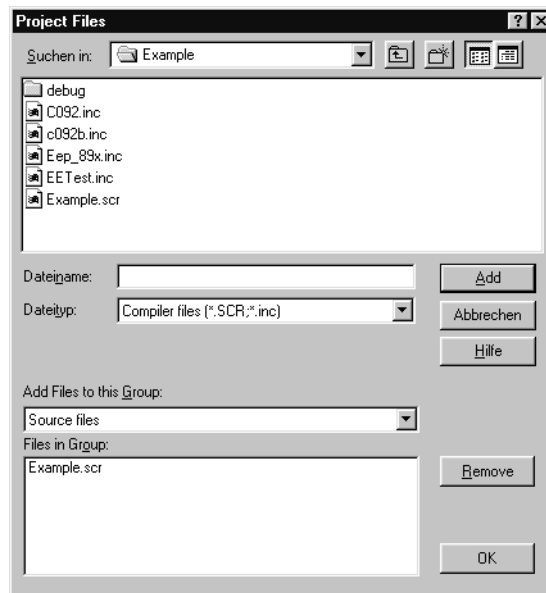

Menu Item *Settings*

General Settings

1. In the input mask *Parameter,* change the name of the source code to the new source code. Do not change the compiler options.

   Example: filename.scr /ASSEMBLER /CRF /LIST /WARN /LOG /REP

2. The input mask *Output file name* must contain the name of the source code with the extension *.hex*.

Figure 5. Compiler Settings
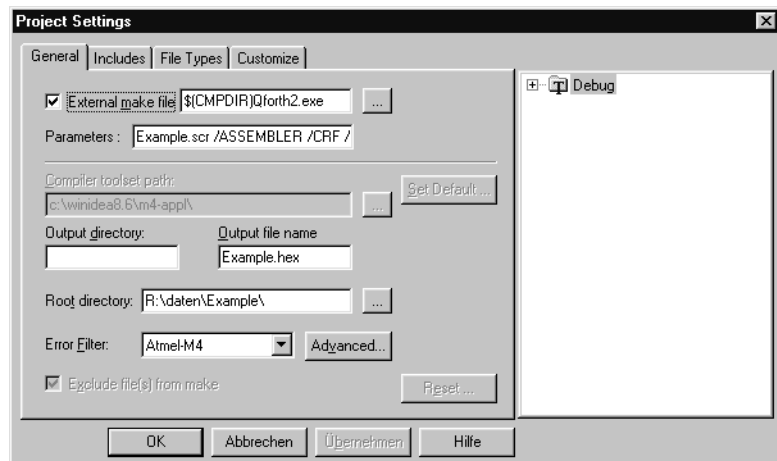
3. Set the *Root directory* to the subdirectory of the project.
4. The field *Error Filter* must display *Atmel-M4*.
5. Click on *Advanced*.
6. Set in the appearing window for Linker *$(OUTPUTDIR)filename.rpt* the new file-name (see Figure 6).
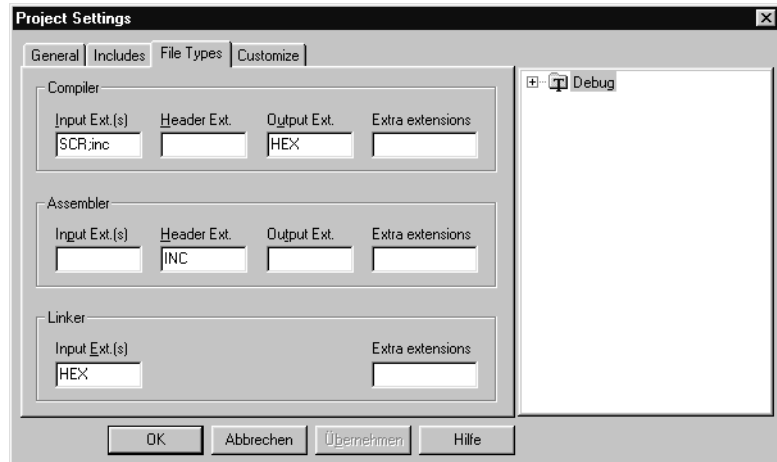7. The item *Use default error file* needs to be inactive.

Figure 6. Select Compiler Report File
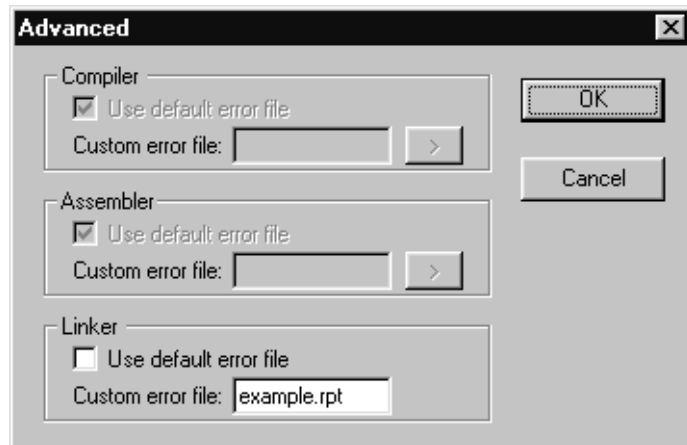
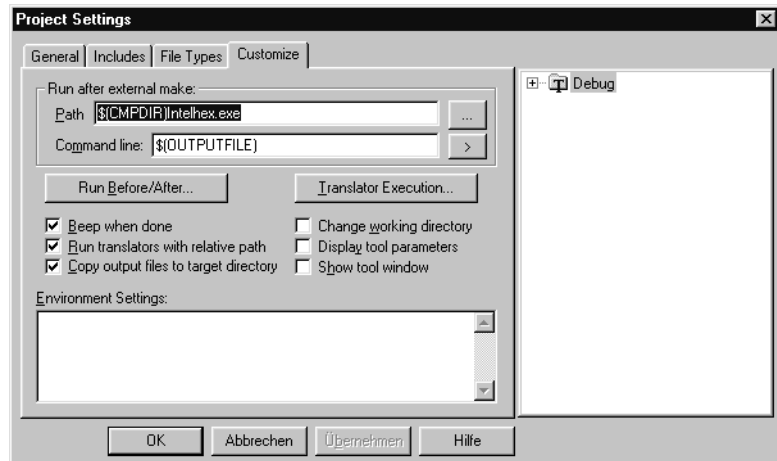**File Types Settings**   The tab *File Types* should be configured like Figure 7.

**Figure 7.** File Type Settings

Customize Settings   The tab *Customize* should be configured like Figure 8.

**Figure 8.** Customize Options

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Now, the settings for writing and compiling a new project are done. To work with the emulator, the files for the download have to be defined. These settings can be done by selecting the menu items *Debug - Files for Download*. The window that appears shows the old files from the previous project. These files have to be deleted and the new files must be entered.

Figure 9. Define Download Files
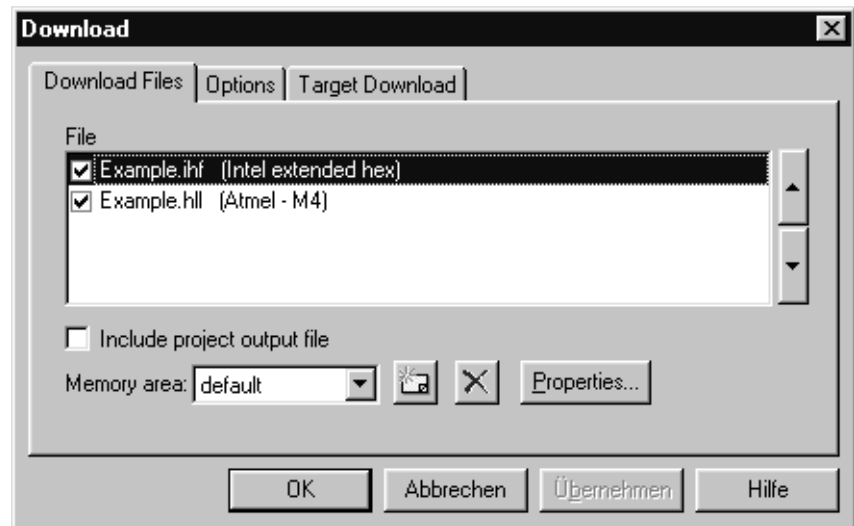
The files the emulator has to download are *filename.ihf* and *filename.hll*. If one of these files is chosen and the button *Open* is selected, a new window will be displayed, where the file type must be selected. The *winIDEA* software recognizes the file type automatically and the type is selected by default (see Figure 10 on page 8). The **.hll* file is the type for *Atmel-M4*, the **.ihf* file is the type for *Intel Extended Hex*.

Figure 10. Select Download File Type
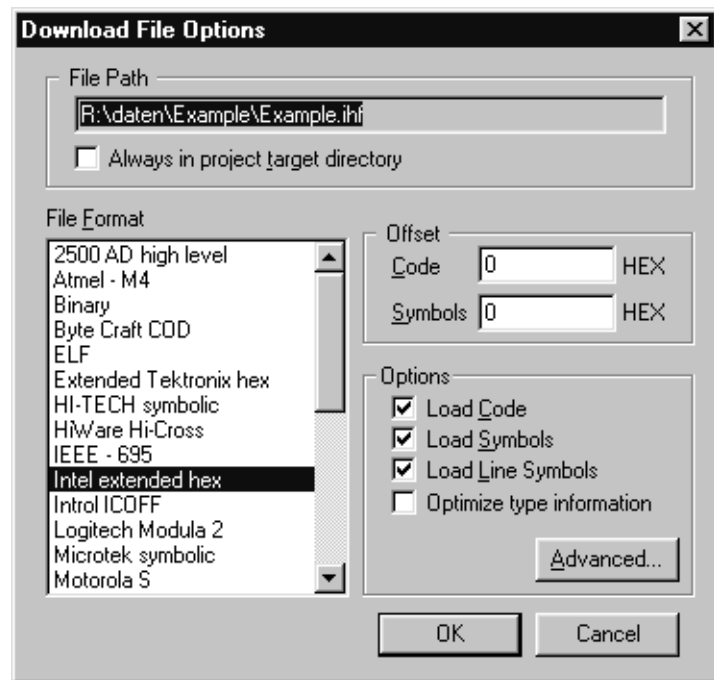
When the settings described up to now have been successfully completed, the work-space is ready to program and debug a new project. Clicking on *make* causes the source code to be compiled. The files will then be automatically downloaded to the emulator.
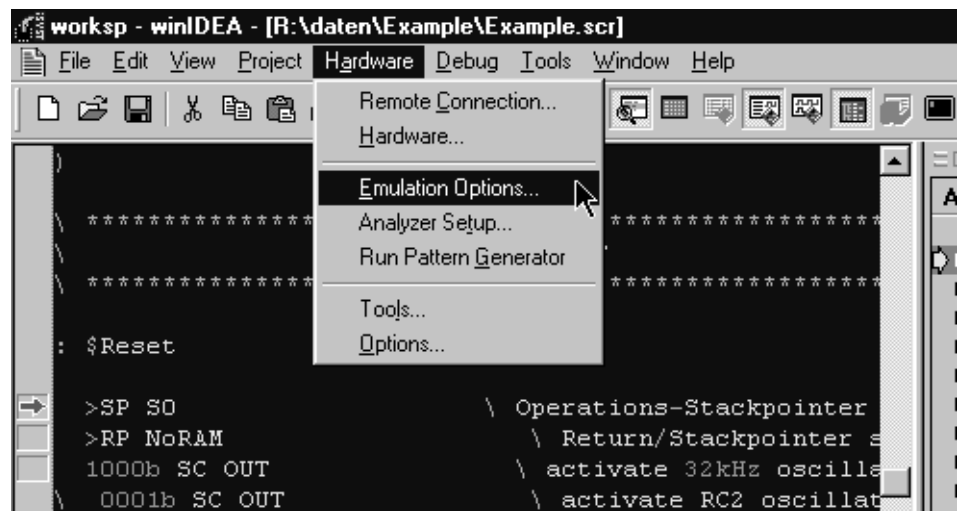
Target Chip Selection

1. The selection of the right MARC4 target chip is done with the menu item *Hardware*.
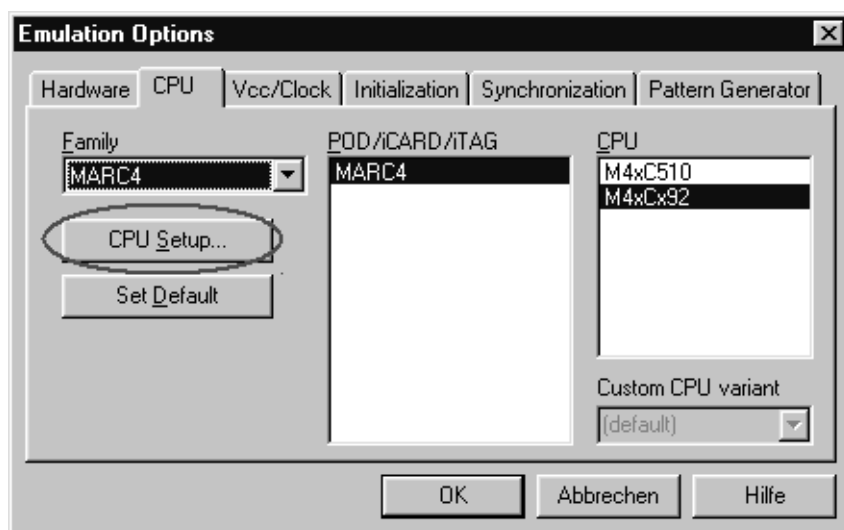
Figure 11. *winIDEA* - Overview
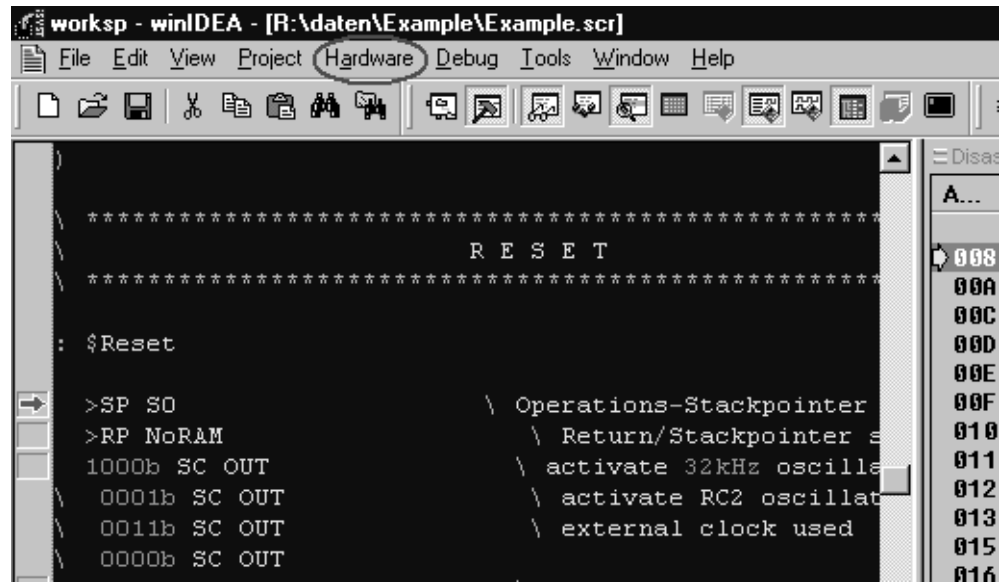
2. Select Hardware -> Emulation Options (see Figure 12)

Figure 12. *winIDEA* - Hardware Menu

A new window will be displayed (see Figure 13 on page 10), where the used CPU can be selected.

Figure 13. CPU Selection

To select the right emulation options, refer to Table 1.

Table 1. MARC4 Device Selection

Target Device	Emulator Selection
ATAR510, T48C510	M4xC510
ATAR080	M4xCx92
ATAR090, ATAR890	
ATAR092, ATAR892	
ATAM893	
ATAM894	
ATAR862, T48C862	
ATA6020N	
U9280M	

Special settings for the target chips are available after selecting *CPU Setup.*

Figure 14. Advanced CPU Settings

With the first download after power-on of the emulation hardware, the MARC4 core definition is loaded into the CPLD on the emulator POD. When selecting the option *Use default,* the standard default settings as given on the CD *winIDEA* is used. After modifying the MARC4 hardware, it may be necessary to use another definition file. This can be done by selecting *Load from external file*. The new core file must be placed in the same directory as the file *winIDEA.Exe*.

The MARC4 hardware version is defined by a specific letter following the part name. The right setting for the target chip used is shown in Table 2.

Table 2. Emulator CPU Setup

Target Chip	Use Default	Load from External File
ATAR080 Version < G	X	
ATAR080 Version ≥ G		X
ATARx90 Version < K	X	
ATARx90 Version ≥ K		X
ATARx92 Version < Q	X	
ATARx92 Version ≥ Q		X
ATAM893 Version < T	X	
ATAM893 Version ≥ T		X
ATAM894 Version < R	X	
ATAM894 Version ≥ R		X
ATA6020N Version < P	X	
ATA6020N Version ≥ P		X

The core definition file, called *C092.hex*, must be placed in the same directory as the *winIDEA.exe.* It can also be downloaded from Atmel's website www.atmel.com.

![ATMEL logo]

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