SOFTWARE RELEASE GUIDE FOR THE MOTOROLA "MCUez™ SDI FOR HC12" SOFTWARE APPLICATION PACKAGE

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1. OVERVIEW

This software release guide briefly lists and describes the files that make up the MCUez software. This document provides required lists, tips for using your MCUez software application for SDI with HC12 devices, and describes workarounds for identified software bugs.

The following HC12 devices are supported in this MCUez release

- M68HC912B32
- M86HC12A4

2. EQUIPMENT REQUIRED

To use the MCUez application you must have:

- An IBM PC or compatible computer using either WIN95 or Windows NT. The computer must have a serial port for communication.

- An HC12-based target system: Emulation Board, SDI™ Interface, serial cable, power supply, and M68HC12-family microcontroller.

3. LOADING SOFTWARE

The MCUez software comes on a CD ROM. To install the MCUez software:

1. Insert the CD into the CD ROM drive of your computer.

2. Select "Run" when prompted by the system.

3. Enter or browse for the "setup.exe" file from in the "Open" editor of the "Run" dialog, and click "OK".

4. The install program automatically loads the software. Follow the instructions that appear on the screen.

5. During installation, you will be asked to select the appropriate MCU target system. Select only one for each installation.

In addition, you can download the MCUez software or install it from our Web site at http://www.mcu.motsps.com/mcuez.

4. SOFTWARE FILES

The following table lists the files that make up the MCUez software application.

MCUez Software Files

Filename	Description
DEMO	Contains examples of assembly files.
PROG	Contains executable files as well as the required DLLs and the /Reg subdirectory for the register files.
LIB	Contains the ANSI C library files. Applicable only when you have installed the Hiware C Compiler package.
MCUTOOLS.INI	Contains MCUez general configuration information
MDSELIB.INI	Contains Motorola general configuration information
MFC40.DLL, MSVCRT40.DLL	Contains Microsoft foundation class library functions used by the MCUez executables.

5. HINTS & WORKAROUNDS

The following sections provide hints and work-arounds to areas of the MCUez application that are not currently fully functional.

5.1 Shell

Check if default directory in the shell configuration is where you want to use MCUez applications through icons. Since MCUez can provide you to install different MCU family development Tools at different time or the same time, the project directory in the shell configuration dialog will displayed according to which development tool is installed or selected LAST. For example, if the HC08 is installed last, the default project directory will be set to ..\MCUez08\Demo\Wmmds08a. If you need to use MCUez HC12 applications, you need to switch default project directory to ..\MCUez12\Demo\Wsdi12a in the shell configuration. Click the "Open" button in the configuration dialog and change the default directory to ..\MCUez12\Demo\Wsdi12a. That way the icons that appear on the shell tool bar will link to all appropriate that are associated with your specific MCUez release package.

5.2 Assembler

5.2.1 Temporary Register Names

The names recognized for the temporary registers in the TFR and EXG instructions is Temp2 and Temp3. These differ from the CPU12 reference manual referring to these registers as TMP2 and TMP3.

5.2.2 Limitations

The EQU object refers to symbols defined in the same assembling unit. For example, the following portion of code generates an error:

```
        XREF extVar
        ...
        label EQU extVar
```

EQU symbols referring to another symbol should be defined in the same assembly unit as the symbol they refer to. EQU objects initialized with an absolute expression cannot be exported. The following portion of code generates an error:

```
        XDEF label

        label EQU 8
```

Absolute EQU symbols must be define in one or several separate files. These files must reference all symbols and be included in the assembly files.

5.2.3 Incompatibility Issues: The MCUez Assembler vs The MCUASM Assembler

5.2.3.1 Case Sensitivity

All labels in the assembler are case sensitive

5.2.3.2 Symbol Name Notation

The MCUez application does not support the character '$' inside of a symbol or label name.

5.2.3.3 PC vs. PCR

Currently The addressing mode notation <offset>, PC and <offset>, PCR are handled in the same way.

- When the offset specified is an absolute expression, this expression is directly encoded in the op code; equivalent to the notation <offset>, PC in MCUasm.

- When the offset specified is the name of a label, the offset between the current PC position and the label is evaluated and encoded in the op-code; equivalent to the notation <offset>, PCR in MCUasm.

5.2.3.4 Direct Addressing Mode

In the MCUasm Assembler, direct addressing mode is used to access symbols defined in the section number 255.

In the MCUez Assembler, direct addressing mode is used to access symbols defined in all sections defined as SHORT section.

5.2.3.5 String Constants

The double quote character is not allowed in a string constant enclosed in double quote.

The single quote character is not allowed in a string constant enclosed in single quote.

5.2.3.6 Operators

The MCUez application does not support the exponentiation operator (!^).

5.2.3.7 Directives

The directive OFFSET is not handled correctly by the MCUez application.

5.3 Linker Limitations

Absolute sections cannot be defined starting at address 0. The Linker will have problems handling the following section correctly:

```
        ORG 0
...
        NOP
        NOP
```

Sections that start at address 0, must be defined as relocatable sections and placed at address 0 in the linker PRM file.

Example of Assembly Source Code

```
Sec_0: SECTION
...
NOP
NOP
Example of PRM file
LINK test.abs
NAMES test.o END
SEGMENTS
ROM_0 = READ_ONLY 0x0000 TO 0x00FF;
MY_ROM = READ_ONLY 0x0800 TO 0x09FF;
MY_RAM = READ_WRITE 0x0A00 TO 0x0AFF;
END
PLACEMENT
Sec_0 INTO ROM_0
.data INTO MY_RAM;
.text INTO MY_ROM;
END
VECTOR ADDRESS 0xFFFE main
INIT main
```

5.4 Debugger

The following limitations apply to the MCUez Debugger for SDI.

- The RESET command has a GO | STOP option, if omitting the option, the default is STOP. The STOP default is not currently fully functional.

- Only one trace window is allowed.

- When you use the command line, the show protocol box in the communication dialog must be unchecked.

- The bus analyzer "Range" trigger points are not fully functional.

- The HC129B32 command line memory tests for the following sequence of MT commands generates a never ending loop in the Debugger as shown below:

```
MT 0x8000..0xffff 0xaa ;wr ;b      Write 0xaa in the memory block from
                                   0x8000 to 0xffff, and it works.
MT 0x80000..0x90000 ;wr ;b         There is no red error and the memory
                                   block os not altered from 0xaa to 0xff.
```

After this test, all memory blocks from 0x0000..0xffff were locked up. They could not be written to using either the MT or MS command.

- Workaround for setting Hardware Breakpoints using MCUez

1. Set "HWBPMODULEADR=0x20" in the default.env from the working directory. (see more information in SDI user manual in section 6.2
2. Start MCUez debugger
3. Select "Set Target" option from "Component" menu
4. Select "Motosil" from "Set target" dialog, and chosse OK
5. Using the pop-up menu from the assembly or source window to select "Set Breakpoints" to set permanent breakpoints or 'Run to Cursor" to set temporary breakpoints on the instruction or code where the program needs to be stopped.

- "Retry" is not working. Try to use the "Abort" to do reconnection with SDI if lost communication occurs.

5.5   C Source-Level Debugging

MCUez supports C source level debugging implicitely (disabled) for this release. You need to purchase the HI-CROSS+ Compiler (version above 5.07) from Hiware, and install C Compiler into MCuez package to make C source level debugging explicitely (enabled).

For information about the Hiware HI-CROSS+ Compiler contact:

> Hiware
> TEL: 011-4161-690-7500
> FAX: 011-41-61-690-7501
> EMAIL: support@HIWARE.hicom.ch

5.6 Converting P&E Commands to Mcuez Commands

The following table shows the correspondence between the P&E debugger most-used commands and the MCUez HC12 debugger commands.

P & E Command	MCUez Command
BF C000 C030 FF	FILL $C000..$C030 $FF
BR 200	BS $200
CODE 10300	DASM $10300
EXIT	(1)
GO 1050 105A	BS $105A
	G $1050
GOTIL 1055	BS $1055 T
	G
LOAD myfile1	SREC myfile1.s19
LOADALL myfile2	LOAD myfile2.abs
MM.B 1000 10 11	MS $1000 $10 $11
MM.B 1000 10 11	WB $1000 $10 $11
MM.W 1000 2222 1111	WW $1000 $2222 $1111
MM.L 1000 22222222 11111111	WL $1000 $22222222 $11111111

MOTOROLA

MD 1000	DB $1000
	DW $1000
	DL $1000
NOBR	BC *
RESET	RESET [2]
STEP 10	T , 10
STEP 1050 10	T $1050, 10
TRACE 200 1050	ARM
	BS 1050 T
	G [3]

1. As MCUez debugger is a Window application, to close the debugger use Alt + F4.

2. This command has different parameters depending on the target interface (SDI or MMDS) and the integration module available for the MCU (LIM, SIM, SCIM, ...)

3. This set of commands only works together with the MMDS emulator. They are not available on SDI version.

6. EE/FLASH PROGRAMMING

The MCUez supports EE programming through SDI (please refer how to do it from SDI target manual), but not Flash programming. However you can integrate Prog12s, which can be used to perform flash programming through SDI, into the MCUez shell configuration to develop one integrated development environment. Please see the read-me file from the Prog12 package distribution package for how to integrate Prog12s to MCUez.

7. CUSTOMER SUPPORT

For the latest product information, bug lists, revision numbers, library source code, and free programs, go to our website at http://www.mcu.motsps.com . Select the FTP File Server icon at the bottom of the web page.