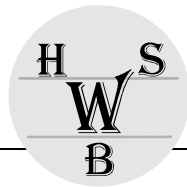


Minimum SOFTWARE MANUAL

OAK_EMUF

Revision 3.05
Status: Preliminary
W. Bals



Edition history

Date	Changes	Name	Comment
002 05 28	First draft	WB	Taken from OS-9 SW description

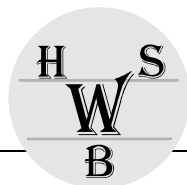


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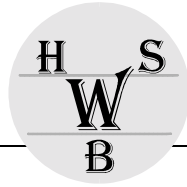
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Preface and

Warnings

Preface

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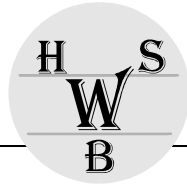
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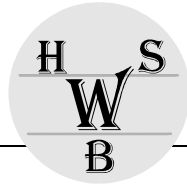
Scope of delivery

Content:

Description	Order No.	comments
Minimal Software		Setup Board (RAM / ROM)

Related products:

Description	Order No.	comments
Hardware and freeware OAKEMUF 2MB RAM, 2MB ROM	GER-99993-000	
Manual OAKEMUF	GER-99994-000	
OS-9000 V2.1 Prof. OS-9000 Board support package OAKEMUF	GER-99991-000	Only available with OAKEMUF HW
OS-9000 V2.2 Prof. OS-9000 Board support package OAKEMUF	GER-99992-000	Only available with OAKEMUF HW complete Hawk / PPC 1.3



Conventions

If not otherwise specified, addresses are written in hexadecimal notation and identified by a leading 0x .

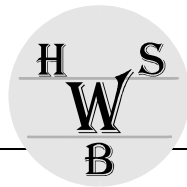
Signal names preceded by a slash („/“) indicate that this signal is either active low or that this signals becomes active with the trailing edge.

General

Character	Description	Remarks
„b“	Bit	
„B“	Byte	
K	Kilo, means the factor 0x400 = 1024	
M	Mega, means the factor 0x100000 = 1048576	
MHz	1 000 000 Hertz	

Software-specific abbreviations:

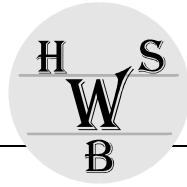
Description	Description	Comments
<BS>	Back Space (0x8)	
<CAN>	Control-X (0x19)	
<Ctrl>	Control	
<CR>	Carriage Return (0xd)	
<ESC>	Escape Character (0x2b)	
<LF>	Line Feed (0xa)	
<SP>	Space (0x20)	
NMI	Non maskable interrupt	



How to use this manual**Documentation conventions:**

Font	Description	Comments
"Courier New"	C-Sources or defines or assembler files	

Other Conventions



Basic features of

Minimum Software for OAKEMUF

1. Full implemented .h-structure of processor internals
2. Full implemented .h structure for all internal peripherals like Serial interface, RAM, FLASH, ADC, CAN, TPU, MIOS, SCI, SPI, ...
3. init process initializing all internal features like chip select, bus interface

The MPC555 is the first PowerPC – device with internal Flash. It also contains all automotive peripherals like Serial, CAN, Timer, ...

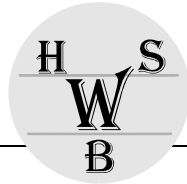
Due to the fixed memory layout and the vector table requirements BALS HW & SW recommends a special memory layout to use all available ROM on board.

The HW recommendation list contains a description to connect external peripherals (f.e. ethernet controller) to use correct bus access and irq model.

Getting started

This manual contains information about the basic software on OAKEMUF board from KANIS
We recommend, that you are familiar with the following documentation:

- OAKEMUF HARDWARE Documentation
- MPC555 user manual
- Using standard editor
- EBDI-light / EBDS-Software
- BDM debug port for Motorola PowerPC on 55x



Installation

Initialisation sequence via BDM

This sequence is also contained in the macro OAK.DO in the BDM / EBDS SW directory (see below).

BDM / EBDS

The installation process is done by EBDS-SW using BDM-interface of 555-processors. The board-support-package is supplied with EBDS-SW and EBDI-lite BDM-interface.

To run EBDS compliant to OAKEMUF, you need 3 support files. All of these files are text-files and simply contain commands for EBDS command line interpreter. The three files are:

File name	Content	Comment
OAK.DO	Initialisation	Init OAKEMUF to run ; after OAKEMUF.do you only need to enter "go"
oakfl1.do	Program first ROM	Bootrom... ; calls flash555.d5x
oakfl2.do	Program 2 nd meg of ROM	Mergelist... calls flash_XXX.d5x
Mp5fl555.do	Program internal flash of MPC555	Option to put high speed applications and OS-9 parts into internal flash

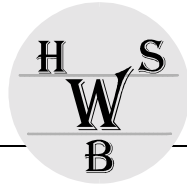
To install a complete new board you should do the following steps:

- connect BDM-connector to you OAKEMUF board
- connect EBDI-lite interface with your PC (LPT-connector)
- start EBDS-SW ("ebds.exe")
- configure EBDS to fit to your application (target 555, LPT-port, ...)
- start Macro OAK.do to initialize hardware
- start first Macro oakfl1.do to program external flash
enter start address 0xfff00000;
enter end address 0xfffffff0
- start second Macro oakfl2.do to program second half of external flash
enter start address 0xffe00000
enter end address 0xffefffff0
- disconnect bdm and ebdi lite
- restart the system,

Attention:

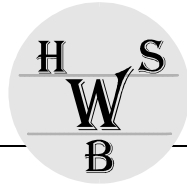
With EBDS there is no way to program only part of the external flash.

With the current EBDS macros the rom-image and the 2ndmeg.rom image must be less than 1 Mbyte.



MPC555 basics

Reset configuration



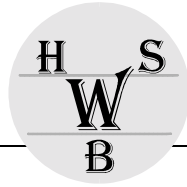
OAKEMUF basics

Memory Layout on OAKEMUF

OAKEMUF is available with different RAM and ROM sizes. User can define these areas by config.des and romcnfg.h files. Normally no changes are required.

Additional memory accesses are driven by additional CS-pins of MPC555. On OAKEMUF there is CS3 which is used for accessing SMC Ethernet controller and additional external devices. All these devices can only be accessed by 16bit transfer! For correct use, 128MB space must be available for every sub-CS on this interface.

All MPC555-CS-features are programmed in sysinit.c file in the ROMCORE directory.



Drivers

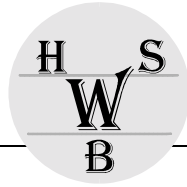
This chapter describes the available drivers for clock, SCF and ISP-devices.

Clock-Module

Realtime clock

The realtime clock on OAKEMUF is driven by OS-9 task.

We recommend to start this task in sysgo-module at startup and to read time/date in this task to setup OS-9 time base.



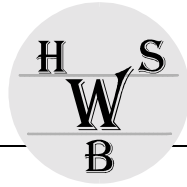
SCF Drivers and

Descriptors

For standard serial I/O the serial interface MPC555 QSM_A module is used. The related files are:

- sc555
- OS-9000 scf driver for serial interface related to motorola QSM interface

QSM Channel B is also available for standard use.



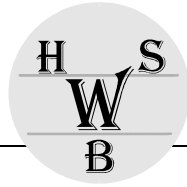
SPF Drivers and

Descriptors

Driver

- smc91c94

The SMC-driver is delivered as a complete OS-9-modul. All changes needed by customer are made by descriptor.



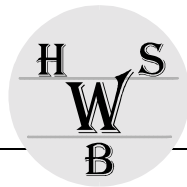
Features and

Enhancements

Tools:

Enhanced software packages are available for EBDS to program internal flash of mpc555.

BALS HARDWARE and SOFTWARE also offers source code for OS-9 to program internal flash, TOUCAN module, TPU, QUADC or QSPI.



Appendix

General source file list

All Source files are fully tested on MPC555 Version G up to Version L
 Not all of these source files are included in standard Board support package (BSP). For all source files, portpack license is required.

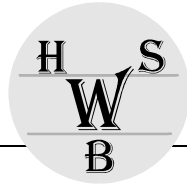
Include files

All include files are tested and support access of internal registers and bits of these registers.

Filename	Directory	Specification	Comment
Siu555.h		Includes for MPC555 internal SIU	
Reg555.h		MPC555 internal register definitions	Like reg505.h
Uimb.h		Includes for MPC555 internal U2IMB interface	Required for irqs and speed control
Sram555.h		Includes for MPC555 internal SRAM	Required for access control and internal definitions
QSMCM.h		Includes for MPC555 internal serial interface	

C-source files

Filename	Directory	Specification	Comment



Related files