Freescale Semiconductor

How to Make a Driver

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1 Objective

2 Requirements

3 Implementation

-How to make a Driver.

-How to prove our Drive.

1. Objective:

Create a new MQX Driver and test it.

2. Requirements:

• For this Lab CW10.6 and MQX4.1 must be installed in your PC.

MQX version support

• CW10.6 – MQX4.1

3. Implementation:

1) Go to **io** folder at:



2) Copy and paste the **io_null** folder, a folder called **io_null** will appear - copy, which is the folder where the new driver will be created:

iganize 🔹 👩 Open	Include in library Share with	▼ Burn New folder	H • 🔳	(
Favorites	Name	Date modified	Туре	
📃 Desktop	i2c	9/8/2014 5:35 PM	File folder	
🚺 Downloads	👔 i2s	9/8/2014 5:35 PM	File folder	
🖳 Recent Places	퉬 int_ctrl	9/8/2014 5:34 PM	File folder	
E	퉬 io_expander	9/8/2014 5:33 PM	File folder	
🔰 Libraries	퉬 io_mem	9/8/2014 5:35 PM	File folder	
Documents	퉬 io_null	9/8/2014 5:35 PM	File folder	
J Music	🌗 io_null - Copy	10/6/2014 4:03 PM	File folder	
Pictures	퉬 lcd	9/8/2014 5:31 PM	File folder	
🛃 Videos	퉬 lpm	9/8/2014 5:35 PM	File folder	
	퉬 lwadc	9/8/2014 5:35 PM	File folder	
🖳 Computer	🌗 Iwgpio	9/8/2014 5:35 PM	File folder	
🏭 Primary (C:)	퉬 nandflash	9/8/2014 5:35 PM	File folder	
Drivers	퉬 pcb	9/8/2014 5:35 PM	File folder	
Freescale	Decard	9/8/2014 5:35 PM	File folder	

3) Rename the new folder io_null, in this case we used io_motorcd

Io_expander	9/8/2014 5:33 PIVI	File tolder
퉬 io_mem	9/8/2014 5:35 PM	File folder
\mu io_motorcd	10/2/2014 2:12 PM	File folder
\mu io_null	9/8/2014 5:35 PM	File folder

4) Inside the folder 3 files are located, to which they should change the name, removing "**null**" and renaming with the desired name:



5) The file **io_motorcd.c** must be modified from a text editor, where the word "null" is replaced by **motorcd**, lines to change are:

Original Code	New Code for Driver
<pre>#include "io_null.h" #include "ionulprv.h" _mqx_uint_io_null_install _io_null_open, _io_null_close, _io_null_read, _io_null_write, _io_null_ioctl, _mqx_int_io_null_close _mqx_int_io_null_read _mqx_int_io_null_write _mqx_int_io_null_write _mqx_int_io_null_ioctl</pre>	<pre>#include "io_motored.h" #include "iomotoredprv.h" _mqx_uint_io_motored_install _io_motored_open, _io_motored_close, _io_motored_read, _io_motored_read, _io_motored_ioetl, _mqx_int_io_motored_open _mqx_int_io_motored_close _mqx_int_io_motored_read _mqx_int_io_motored_write _mqx_int_io_motored_ioetl</pre>

6) The file **io_motorcd.h** must be modified from a text editor, where the words" null" is replaced by **motorcd**, lines to change are:

Original Code	New Code for the Driver
#ifndef_io_null_h_	#ifndef_io_motorcd_h_
#define_io_null_h_extern_mqx_uint_io_null_install(char*);	#define_io_motorcd_h_extern_mqx_uint_io_motorcd_install(char*);

7) The file **io_motorcdprv.h** must be modified from a text editor, where the words "**null**" is replaced by **motorcd**, lines to change are:



8) Modify the file .**bat** using a text editor. This file is located at the following path:

		Findy Fiber	· · · · · · · · · · · · · · · · · · ·		
)rganize 🔻 🛛 🖬 Oper	n Print Burn New folder				
Favorites	Name	Date modified	Туре	Size	
E Desktop	sp_twrk60f120m	8/20/2014 1:25 PM	Windows Batch File	11 KB	
Downloads	bsp_twrk60f120m.sh	8/20/2014 1:25 PM	SH File	9 KB	
Recent Places	sp_twrk60n512	8/20/2014 1:41 PM	Windows Batch File	12 KB	
=	bsp_twrk60n512.sh	8/20/2014 1:41 PM	SH File	11 KB	
Libraries	sp_twrk64f120m	8/20/2014 12:18 PM	Windows Batch File	10 KB	
Documents	bsp_twrk64f120m.sh	8/20/2014 12:18 PM	SH File	9 KB	
J Music	bsp_twrk70f120m	10/2/2014 2:33 PM	Windows Batch File	13 KB	
Pictures	bsp_twrk70f120m.sh	8/20/2014 12:44 PM	SH File	12 KB	
Videos	bsp_twrmcf51jf	8/20/2014 12:42 PM	Windows Batch File	9 KB	
	bsp_twrmcf51jf.sh	8/20/2014 12:42 PM	SH File	8 KB	
Computer	bsp_twrmcf52259	8/20/2014 1:47 PM	Windows Batch File	7 KB	
A Primary (C:)	bsp_twrmcf52259.sh	8/20/2014 1:47 PM	SH File	6 KB	
Drivers	bsp_twrmcf54418	8/20/2014 12:32 PM	Windows Batch File	7 KB	
Freescale	bsp_twrmcf54418.sh	8/20/2014 12:32 PM	SH File	6 KB	
Intel	bsp_twrvf65gs10_a5	8/20/2014 12:52 PM	Windows Batch File	9 KB	
	hen tun f65ac10 -5 ch	9/20/2014 12-52 DNA	CLI Ella	0 1/0	

9) Inside archive .bat, add the following line:

copy"%ROOTDIR%\mqx\source\io_io_motorcd\io_motorcd.h""%OUTPUTDIR%\io_motorcd.h":

copy	"%ROOTDIR%\mqx\source\io\enet\enet_wifi.h" "%UTPUTDIR%\enet_wifi.h" /Y
copý	"%ROOTDIR%\mqx\source\io\lwgpio_lwgpio_kgpio.h" "%OUTPUTDIR%\lwgpio_kgpio.h" /Y
copy	"%ROOTDIR%\mqx\source\io\io_null\io_null.h" "%OUTPUTDIR%\io_null.h" /Y
сору	"%ROOTDIR%\mqx\source\io\io_motorcd_\io_motorcdh" "%OUTPUTDIR%\io_motorcdh" /Y
сору	"%ROOTDIR%\mqx\source\io\io_motorcd\io_motorcd.h" "%OUTPUTDIR%\io_motorcd.h" /Y
сору	"%ROOTDIR%\mqx\source\io\io_chonchito\io_null.h" "%OUTPUTDIR%\io_null.h" /Y
сору	"%ROOTDIR%\mqx\source\bsp\twrk21d50m\init_lpm.h" "%OUTPUTDIR%\init_lpm.h" /Y
сору	"%ROOTDIR%\mqx\source\io\gpio\kgpio\io_gpio_kgpio.h" "%OUTPUTDIR%\io_gpio_kgpio.h" /Y
сору	"%ROOTDIR%\mqx\source\io\i2c\i2c.h" "%OUTPUTDIR%\i2c.h" /Y
copy	"%ROOTDIR%\mqx\source\io\adc\adc_conf.h" "%OUTPUTDIR%\adc_conf.h" /Y
сору	"%ROOTDIR%\mqx\source\io\sdcard\sdcard.h" "%OUTPUTDIR%\sdcard.h" /Y
сору	"%ROOTDIR%\config\common\smallest_config.n" "%OUTPUTDIR%\\smallest_config.h" /Y

10) Open CodeWarrior Generic_IO_Drivers and drag the folder io_motorcd inside the bsp card folder to use:



11) Dragging the folder, a window will appear where you will select "copy files and folders":



11) Remove the above folder and paste it again, this time select "Link to files and folders" and "MQX_ROOT_DIR"



12) Right click on bsp folder and select properties \rightarrow C/C++ build \rightarrow Settings \rightarrow Arm Ltd Windows GCC Assembler \rightarrow Directories:



13) Add the driver clicking new and typing "motorcd":

Add directory path	
Directory: "C:\Freescale\Freescale_MQX_4_1\mqx\bu	ild\cw10gcc\bsp_twrk21d50m/
"\${ProjDirPath}///source/io/io_motorcd"	
Relative To: ProjDirPath	Variables
	Workspace
	File system

14) Do the same in Windows GCC Compiler Arm Ltd:

Settings					
🛞 Tool Settings 🎤 Build Steps 🚇 Build Artifac	t 🗟 Binary Parsers	😣 Error Parsers	Build Tool Versions		
 Tool Settings Build Steps Build Artifaction Target Processor Debugging Additional Tools Librarian ARM Ltd Windows GCC Assembler Preprocessor Directories Warnings Miscellaneous ARM Ltd Windows GCC C Compiler Preprocessor Optimization Warnings Miscellaneous ARM Ltd Windows GCC Archiver General ARM Ltd Windows GCC C Preprocessor Disassembler Settings ARM Ltd Windows GCC C Preprocessor Disassembler Settings ARM Ltd Windows GCC C Preprocessor 	t Binary Parsers Include paths (-I) "S{ProjDirPath}//Gene "S{ProjDirPath}//Gene "S{ProjDirPath}/// "S{ProjDirPath}//	Error Parsers Trated_Code" es" th)/lib/Kinetis/pdd /source/io/adc/"a /source/io/adc/"a /source/io/dac" /source/io/flashx/f /sourc	Build Tool Versions //inc" dc" 50m" freescale" gpio" er" led" 1d50m" n" , n" nchito"		
	"\${ProjDirPath}///	/source/io/io_mot /source/io/pipe"	orca		

How to prove that our driver work?

- 1) Create a new MQX project.
- 2) Open main.c and main.h files.
- 3) Add the library "io_motorcd_.h" in the main.h file:



4) Add the following code in main.c

#include "main.h"

```
void Main_task(uint32 t initial data){
      FILE_PTR motorcd__file; /* pointer to a file device structure*/
      uint8 t data[10];
      if (IO_OK != _io_motorcd__install("motorcd_:")){
             printf("Error opening motorcd_ driver\n");
      }
      if (NULL == (motorcd_file = fopen("motorcd_:", NULL )))
      {
             printf("Opening motorcd_ device driver failed.\n");
             _mqx_exit(-1);
      }
      if (write(motorcd_file, data, 4 ) != 4)
      {
             printf("Writing to motorcd_ driver failed.\n");
             _mqx_exit(-1);
      }
      else
      {
             printf("Writing to motorcd driver success.\n");
      fclose(motorcd__file);
      printf ("motorcd_ driver working\n");
mqx_exit(0);
}
```

5) Compile the code, if no exist error, our driver works perfectly.



That now completes Lab 2.