

Programming Embedded Systems 2017 / JB

Exercise 1

Return report electronically on address: <https://abacus.abo.fi/ro.nsf>. If you do not have an ÅA account, please email jerker.bjorkqvist@abo.fi

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Equipment and tools

Equipment used:

- a) Texas Instruments LaunchPad **MSP430G2** development card
- b) Own laptop

Objective

The objective of today is to set up the development environment and do some basic programming. The development tools used are GCC for building on Texas instruments.

Task

The task is to implement a super-loop structured task in software. The Super-loop structured task should do the following:

- Switch the **red led** on the development platform **on and off** with internals of 1 second (the period of a on/off-cycle being 1 s)
- The delay should (in this exercise) be created **using a delay loop**
- Make an alternative; **alternate between green and red led**
- Find out on which hardware address the input of Port 1 on the microcontroller can be read; find also out which include file is used for the microcontroller

Description

In order to build the software, we need a development environment. In this course, we use the GCC version for the MSP430 (alternative would be TI CodeComposer Studio, but we will stick to GCC).

GCC for MSP430 is available at TI home page, however; local versions are available

<http://users.abo.fi/jbjorkqv/msp430-gcc-windows.exe>

linux: <http://users.abo.fi/jbjorkqv/msp430-gcc-linux.run>

Download and install in a directory of your choice <INSTALL_DIR> in your laptop. In order to install drivers for USB connection; go to directory <INSTALL_DIR>/emulation/drivers/msp430/DPIInst.

For details on how to use the compiler look on directory <INSTALL_DIR>/docs.

1. Start by compiling the example file (note; on a windows machine, you need the tool "make" and make it available in the path, one easy one for windows is available at users.abo.fi/jbjorkqv/make.exe)

~~2. Execute the program — this is done by~~

~~a. Starting the debug agent (<INSTALL_DIR>\bin\gdb_agent_console_msp430.dat)~~

~~b. starting the debugger, using command "make-debug"~~

~~c. In debugger~~

~~i. connect to device: > target remote :55000~~

~~ii. load program (> load)~~

~~iii. run program (> continue)~~

Alternative 2 (better...)

a) download the package users.abo.fi/jbjorkqv/mspdebug.zip

b) unpack into for instance folder c:\ti

c) run the command (from command prompt (win+r → cmd))

mspdebug tilib

d) program using command

prog <path_to_.out-file>

run

3. Verify that the blinking of led is OK

NOTES!

1. The default software enables the watchdog timer in the device. Unless properly handled, the watchdog timer will reset the device every 2-3 seconds. To disable the watchdog timer, the watchdog control register WDTCTL is given value WDTPW|WDTHOLD.

Datasheet for MSP430 microcontroller can be found at

- Date / timeframe when exercise performed
- Group (if not done individually)
- Assumptions on knowledge of the reader
- Own contribution (if performed in group)
- Description of the task / exercise
- Description of the equipment used
- Description of performed work
- Achieved results