

FRDM_KL43_OL2385_ConsoleControl

Project for SIGFOX SW Driver

Date: *10/03/2016*

Revision: *1.0*

Overview

The purpose of this example project is to show how to control the SIGFOX device with use of the SIGFOX SW driver built on AML (Analog Middleware Layer) in Kinetis Design Studio environment. It uses the virtual serial console to execute SPI commands of the SIGFOX device.

Hardware requirements

The following is required:

- FRDM-KL43Z MCU
- OM2385/SF001 development kit
- USB cable
- Antenna – for example QUINTUS EAD

Setting up hardware

Target platform for this example is FRDM-KL43Z and OM2385/SF001. This evaluation board is designed to be pinout compatible with named FRDM-KL43Z and also with wide range of freedom boards based on Kinetis MCUs. Please refer to the SIGFOX software driver user guide for more details.

Make sure that you set jumpers JP1 and JP2 of the SIGFOX board to correct positions. This setting is crucial because it involves voltage reference selection. This application uses 3V option (1-2 position on JP1 and JP2).

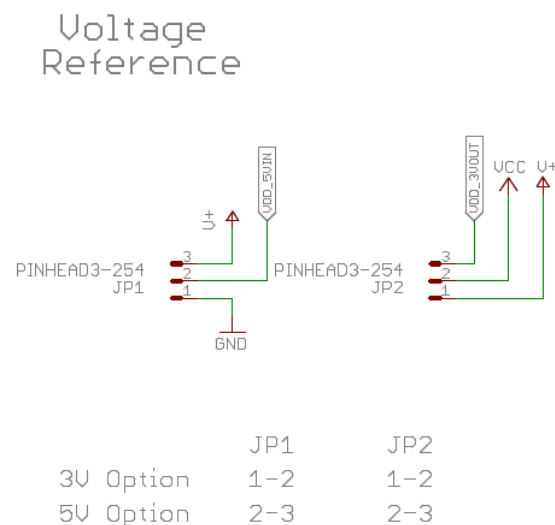


Figure 1. Voltage reference selection

On the Figure 2 you can see hardware setup with an antenna connected. The antenna should be attached to a connector on the small LID2186 board placed on the OM2385/SF001 board.

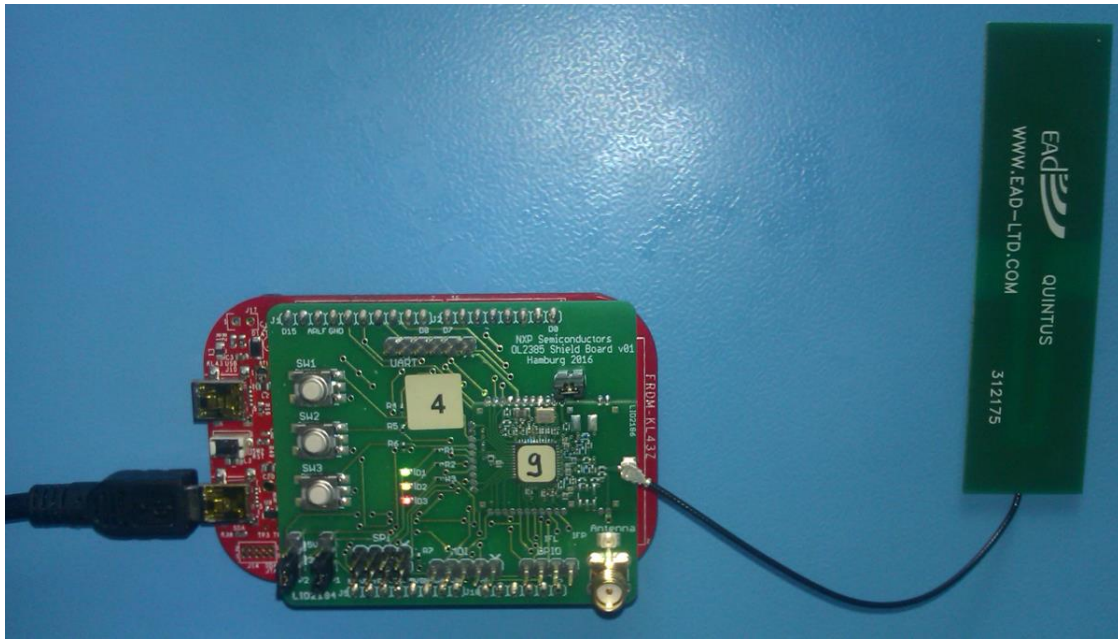


Figure 2. Hardware setup with the antenna connected

Setting up software

Make sure that you have installed KDS 3.2.0 and newer.

Check that your debug connection has been set up properly. Type of used debug connection depends on used MCU. FRDM-KL43Z uses **OpenSDA**, see Figure 3. Note that number of COM port may differ because of different system resource usage.



Figure 3 OpenSDA virtual port

The application uses the virtual serial port to print user/debug messages. You may use PC application such as HyperTerminal. All what you need is to specify used **COM** port and **baud rate** (default **115200** for most of the examples).

Peripherals and pins

The project uses the following peripherals:

- SPI – SIGFOX SPI communication.
- GPIO – SIGFOX SPI chip select pin controlled in software.
- GPIO – SIGFOX acknowledge pin.
- UART – virtual serial console.

Pin selection for all mentioned peripherals follows values in Table 1.

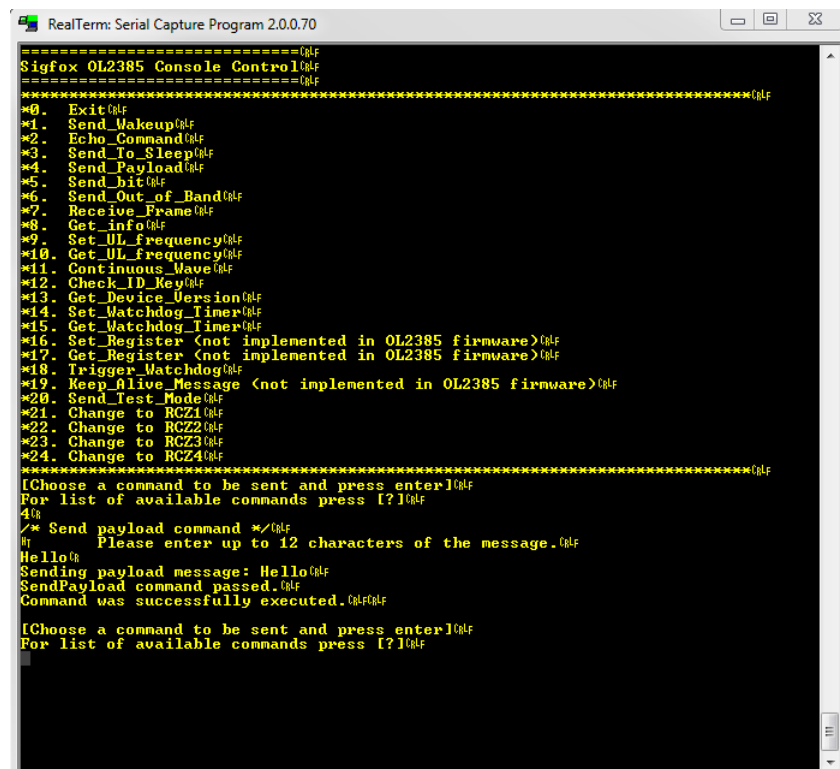
Table 1. Pin selection

Pin function	Pin name	KL43Z48M pin
SIGFOX SPI	SPI1 MOSI	PTD6
	SPI1 MISO	PTD7
	SPI1 SCK	PTD5
SIGFOX SPI CS	GPIO	PTD4
SIGFOX ACK	GPIO	PTD2
Virtual serial console	UART0 Rx	PTA1
	UART0 Tx	PTA2

Description

In this example is shown how to control the SIGFOX device with use of the SIGFOX SW driver built on AML (Analog Middleware Layer). It enables the user to execute any SPI command supported by the device.

The application prints a command list to the console and waits for a user action. The Figure 4 shows execution of the **Send Payload** command (command no. 4), which sends user data to the SIGFOX network. Then the user can login to the SIGFOX server and check the received message.



```
RealTerm: Serial Capture Program 2.0.0.70
Sigfox OL2385 Console Control
=====
*0. Exit
*1. Send_Wakeup
*2. Echo_Command
*3. Send_To_Sleep
*4. Send_Payload
*5. Send_bit
*6. Send_Out_of_Band
*7. Receive_Frame
*8. Get_info
*9. Set_UL_frequency
*10. Get_UL_frequency
*11. Continuous_Wave
*12. Check_ID_Key
*13. Get_Device_Version
*14. Set_Watchdog_Timer
*15. Get_Watchdog_Timer
*16. Set_Register <not implemented in OL2385 firmware>
*17. Get_Register <not implemented in OL2385 firmware>
*18. Trigger_Watchdog
*19. Keep_Alive_Message <not implemented in OL2385 firmware>
*20. Send_Test_Mode
*21. Change to RCZ1
*22. Change to RCZ2
*23. Change to RCZ3
*24. Change to RCZ4
=====
[Choose a command to be sent and press enter]
For list of available commands press [?]
4
/* Send payload command */
Please enter up to 12 characters of the message.
Hello
Sending payload message: Hello
SendPayload command passed.
Command was successfully executed.
[Choose a command to be sent and press enter]
For list of available commands press [?]
```

Figure 4. User interface

Note:

The SIGFOX software driver user guide describes how to register a SIGFOX device on the SIGFOX website.

Import the example project

The following steps shows how to import the example project into KDS 3.2.0.

1. In KDS click on the ***File / Import***.
2. Choose ***General / Existing Projects into Workspace***.
3. Click ***Browse to select root directory*** with your downloaded example projects.
4. ***Select project*** named **FRDM_KL43_OL2385_ConsoleControl** and click ***Finish*** to complete the process.
5. Now the example project should be in your workspace and ready to run.

Building and running the project

In order to build and run the project you need to ***build*** the project usual way. If the build is successful, ***debug and run*** the project. This can be accomplished in following steps:

1. Click on the **arrow** next to the **debug icon** and select **Debug Configurations**.
2. **Select** one of the existing configurations with **project name** under **PEMicro** group or **create** one by double clicking on this group.
3. Pick up proper **debug interface** and **USB port**.
4. Apply changes and click on **Debug**.

If you have any questions related to how to work with debug configurations, see ***Kinetis Design Studio User's Guide***.