DVK-SFxx-y-GEVK EVBUM

AX-SFxx-y-GEVK Evaluation Board User's Manual

ON Semiconductor®

EVAL BOARD USER'S MANUAL

Introduction

The DVK−SFxx−y−GEVK kit is a quick start solution for the development of Sigfox® applications using the AX−SFxx−y System on Chip (SoC).

The xx in the part numbers in this document refer to: xx = EU, US, JK, or AZ which correspond to Sigfox regions RCZ1, RCZ2, RCZ3, and RCZ4, respectively. The y is for the revision.

This user manual is applicable for all four kits.

The y in the part numbers refer to the current version of the kit.

Usage

Customers can communicate with the AX−SFxx−y SoC by terminal emulation software or with an external micro−controller to test Sigfox connectivity and to develop their application using the pre−programmed AT command set as documented in the corresponding product datasheets.

Kit Contents

- 1 Mini−module with AX−SFxx−x SoC and SMA Connector
- 1 Debugger Interface with Ribbon Cable
- 1 Mini−USB Cable
- 1 SMA Antenna

Figure 1. DVK Boards

APPLICATIONS INFORMATION

Hardware Setup

- Attach the included antenna to the SMA connector on the mini−module.
- Connect the ribbon cable to the debugger board which is keyed.
- The other side of the ribbon cable connects to the mini−module, and the ribbon cable should be connected so that the ribbon cable points away from the mini−module. See the picture below.
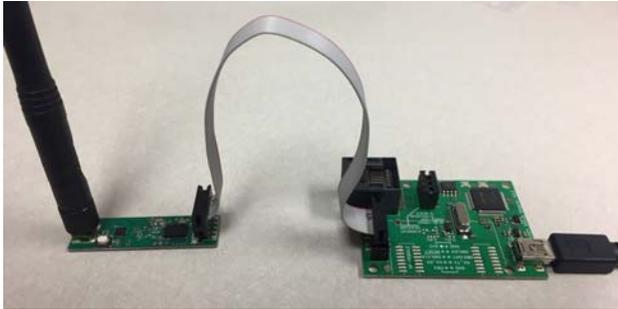
Figure 2.

Prerequisite Software

A serial console or terminal emulator will be needed to communicate to the kit by PC over USB. Popular choices are PuTTY and hterm, but there are many others.

The following link form sparkfun provides a lot of great information about serial consoles and how to use them. The link also describes many of the popular consoles you can choose from.

https://learn.sparkfun.com/tutorials/terminal−basics/all

Along with the serial console, the driver for the USB virtual COM port will also be needed. On Windows, normally you can just plug in the USB cable and Windows will automatically download the necessary driver. Please note that this can take several minutes but only happens the first time the board is plugged in.

If you need to download the drivers manually, please visit the FTDI driver website below and select the right version for your computer.

http://www.ftdichip.com/Drivers/VCP.html

Software Setup

Before the serial console can connect with the kit the COM port number must be found. On Windows this can be done in the device manager. Look for the Ports (COM & LPT) section. See below an example that shows a device connected to COM8 as highlighted in the picture.
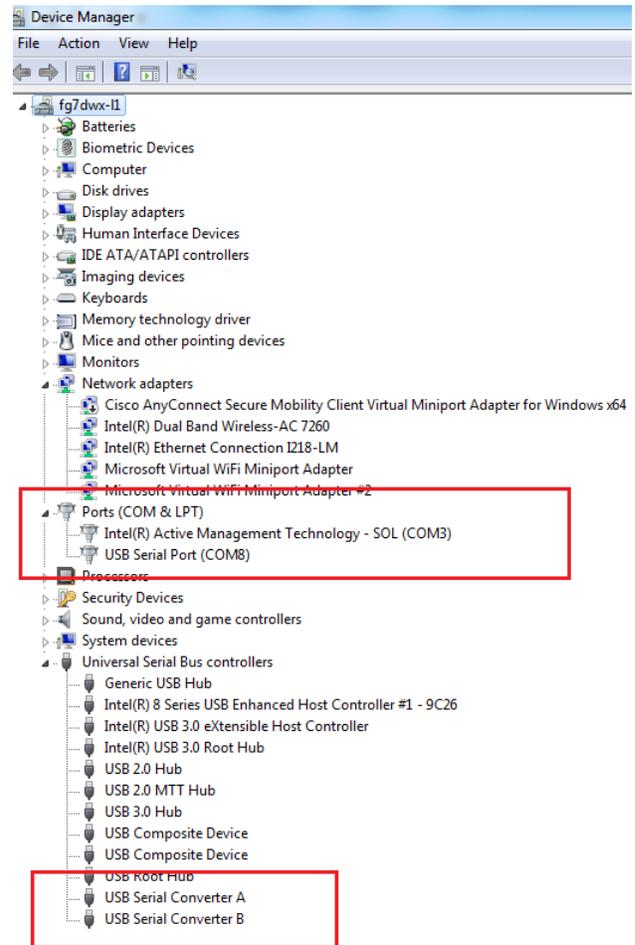
Figure 3.

Please note that the debugger board, which is where the USB to serial converter is, uses USB Serial Converter B. This is seen in the Universal Serial Bus controller sections as highlighted in the picture above.

Please right−click on the USB serial Converter B, and select properties. Then click the advanced tab, and ensure that the Load VCP option is selected. This should be automatic but sometimes needs to be selected manually. See Figure 4.
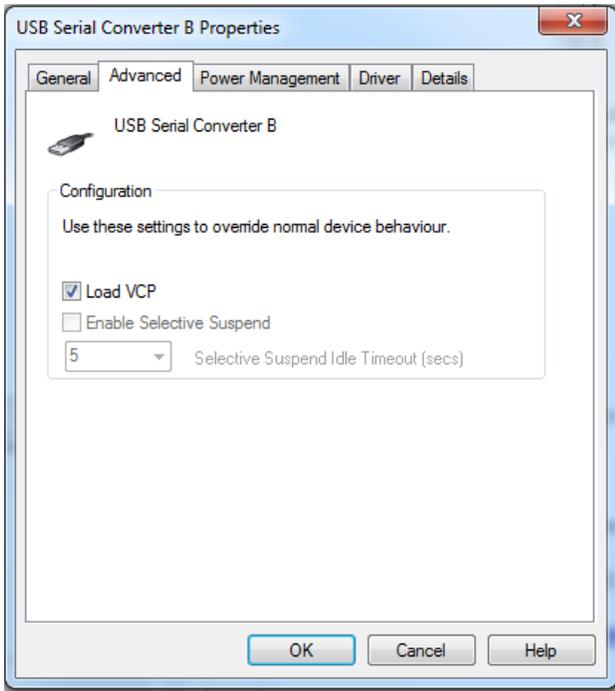
Figure 4.

Once a suitable serial console is available and the COM port number is known, the connection can be established. The serial protocol uses the following parameters.

- 9600 baud
- 8 bit words
- No parity bit
- One stop bit
- No flow control

Using the serial console, establish a connection to the device through the COM port determined above and using the settings provided. To test the connection, simply type "**AT**" followed by a CR (Carriage Return) and/or LF (Line Feed).

If the response is "**OK**" then the device is connected and ready for use.

If no response is received then this indicates a bad connection. This can be caused by the debugger ribbon cable being plugged in backwards, the wrong COM port number or wrong serial protocol setup is being used.

Tip: When using some serial consoles, such as PuTTY, local echo must be enabled to see what is being typed. Please make sure this is enabled to avoid confusion as commands are typed. Also, some serial consoles don't automatically add the CR/LF when the enter key is pressed. Double check that this is enabled if you don't see the "OK" response.

Sigfox ID and PAC

With the serial communication working, the ID and PAC of the kit can be read out of the device. These two pieces of information are necessary to register the device to be used on the Sigfox network.

To read the ID, issue the command "**AT$I=10**", and the response will be an 8 digit hex string.

To read the PAC, issue the command "**AT$I=11**" and the response will be a 16 digit hex string.

Sigfox Registration

With the ID and PAC, proceed to the following website to register the device to the Sigfox network.

https://backend.sigfox.com/activate/ON

The Sigfox backend is the primary interface for Sigfox developers to get information out of the Sigfox network.

Sigfox has created a YouTube playlist for instructions on how to use the backend. Below is a link to the "The Sigfox Backend" playlist.

https://www.youtube.com/playlist?list=PLcw1TnahFRW−dpqGwxa3noSMLP_nTEhdb

For more information about the Sigfox network, please view the "Introduction to Sigfox technology" playlist at this link:

https://www.youtube.com/playlist?list=PLcw1TnahFRW−EuxL437_6L1RdUGJqELvw

Application Development

Once the kit is registered to the Sigfox backend, the device can be used to transmit messages to/from the Sigfox network. Besides the Sigfox commands, all the other AT commands listed in the product datasheets can be used as well.

Here are links to the datasheets:

http://www.onsemi.com/pub/Collateral/AX−SFEU−D.PDF
http://www.onsemi.com/pub/Collateral/AX−SFUS−D.PDF
http://www.onsemi.com/pub/Collateral/AX−SFJK−D.PDF
http://www.onsemi.com/pub/Collateral/AX−SFAZ−D.PDF

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