

DVK-SFxx-y-GEVK EVBUM

AX-SFxx-y-GEVK Evaluation 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



ON Semiconductor[®]

www.onsemi.com

EVAL BOARD USER'S MANUAL

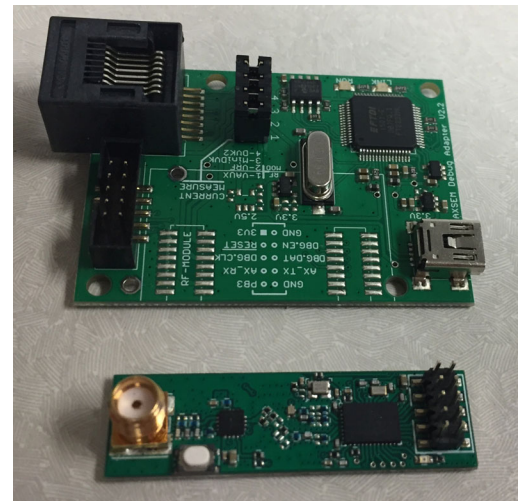


Figure 1. DVK Boards

DVK-SFxx-y-GEVK EVBUM

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.

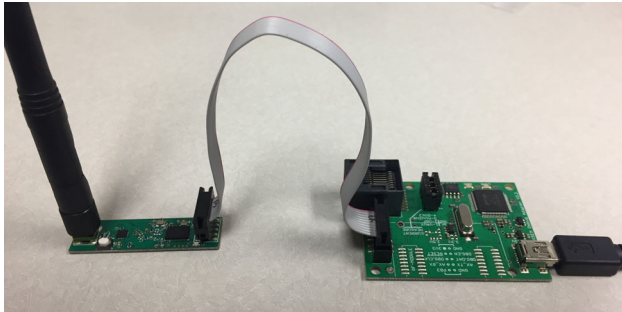


Figure 2.

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 from 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.

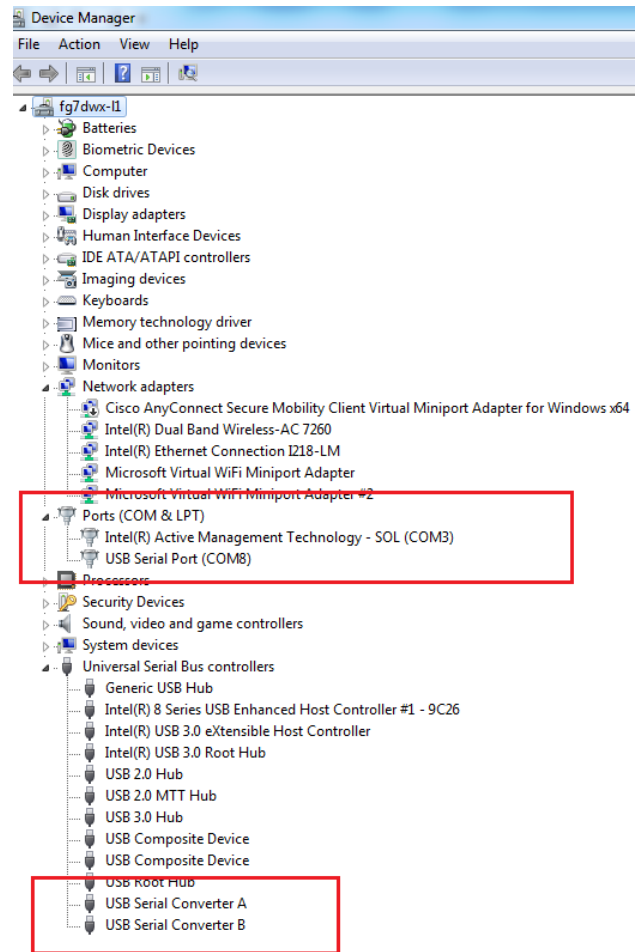


Figure 3.

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.

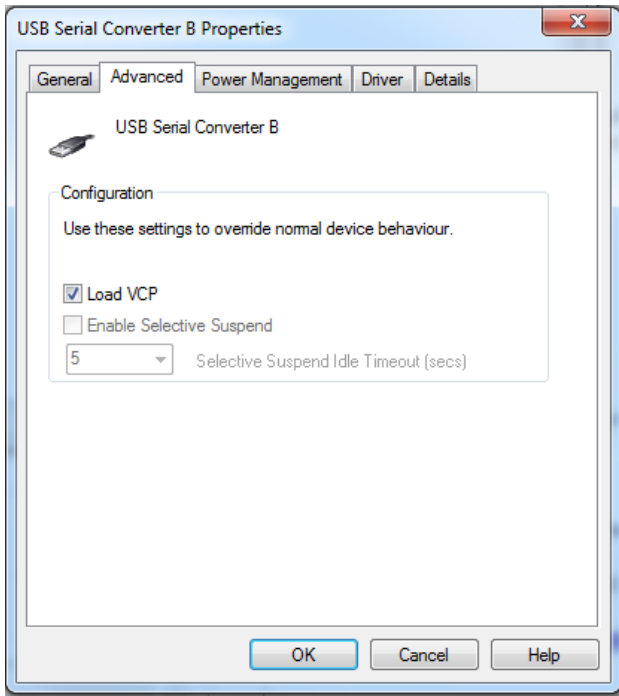


Figure 4.

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>

onsemi, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

The evaluation board/kit (research and development board/kit) (hereinafter the "board") is not a finished product and is not available for sale to consumers. The board is only intended for research, development, demonstration and evaluation purposes and will only be used in laboratory/development areas by persons with an engineering/technical training and familiar with the risks associated with handling electrical/mechanical components, systems and subsystems. This person assumes full responsibility/liability for proper and safe handling. Any other use, resale or redistribution for any other purpose is strictly prohibited.

THE BOARD IS PROVIDED BY ONSEMI TO YOU "AS IS" AND WITHOUT ANY REPRESENTATIONS OR WARRANTIES WHATSOEVER. WITHOUT LIMITING THE FOREGOING, ONSEMI (AND ITS LICENSORS/SUPPLIERS) HEREBY DISCLAIMS ANY AND ALL REPRESENTATIONS AND WARRANTIES IN RELATION TO THE BOARD, ANY MODIFICATIONS, OR THIS AGREEMENT, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION ANY AND ALL REPRESENTATIONS AND WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, NON-INFRINGEMENT, AND THOSE ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE CUSTOM OR TRADE PRACTICE.

onsemi reserves the right to make changes without further notice to any board.

You are responsible for determining whether the board will be suitable for your intended use or application or will achieve your intended results. Prior to using or distributing any systems that have been evaluated, designed or tested using the board, you agree to test and validate your design to confirm the functionality for your application. Any technical, applications or design information or advice, quality characterization, reliability data or other services provided by **onsemi** shall not constitute any representation or warranty by **onsemi**, and no additional obligations or liabilities shall arise from **onsemi** having provided such information or services.

onsemi products including the boards are not designed, intended, or authorized for use in life support systems, or any FDA Class 3 medical devices or medical devices with a similar or equivalent classification in a foreign jurisdiction, or any devices intended for implantation in the human body. You agree to indemnify, defend and hold harmless **onsemi**, its directors, officers, employees, representatives, agents, subsidiaries, affiliates, distributors, and assigns, against any and all liabilities, losses, costs, damages, judgments, and expenses, arising out of any claim, demand, investigation, lawsuit, regulatory action or cause of action arising out of or associated with any unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of any products and/or the board.

This evaluation board/kit does not fall within the scope of the European Union directives regarding electromagnetic compatibility, restricted substances (RoHS), recycling (WEEE), FCC, CE or UL, and may not meet the technical requirements of these or other related directives.

FCC WARNING – This evaluation board/kit is intended for use for engineering development, demonstration, or evaluation purposes only and is not considered by **onsemi** to be a finished end product fit for general consumer use. It may generate, use, or radiate radio frequency energy and has not been tested for compliance with the limits of computing devices pursuant to part 15 of FCC rules, which are designed to provide reasonable protection against radio frequency interference. Operation of this equipment may cause interference with radio communications, in which case the user shall be responsible, at its expense, to take whatever measures may be required to correct this interference.

onsemi does not convey any license under its patent rights nor the rights of others.

LIMITATIONS OF LIABILITY: **onsemi** shall not be liable for any special, consequential, incidental, indirect or punitive damages, including, but not limited to the costs of requalification, delay, loss of profits or goodwill, arising out of or in connection with the board, even if **onsemi** is advised of the possibility of such damages. In no event shall **onsemi**'s aggregate liability from any obligation arising out of or in connection with the board, under any theory of liability, exceed the purchase price paid for the board, if any.

The board is provided to you subject to the license and other terms per **onsemi**'s standard terms and conditions of sale. For more information and documentation, please visit www.onsemi.com.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Email Requests to: orderlit@onsemi.com

onsemi Website: www.onsemi.com

TECHNICAL SUPPORT

North American Technical Support:

Voice Mail: 1 800-282-9855 Toll Free USA/Canada

Phone: 011 421 33 790 2910

Europe, Middle East and Africa Technical Support:

Phone: 00421 33 790 2910

For additional information, please contact your local Sales Representative