
Evaluation Kit ATA8520-EK1-F and Extension Board ATA8520-EK3-F (US Version)

APPLICATION NOTE

Kit Content

The ATA8520-EK1-F kit includes the following components:

- Standalone board
- 902MHz antenna

Not included are

- 3V power supply or battery and cable
- AVR[®] debugger

The ATA8520-EK3-F extension board includes the following components:

- Extension board
- 902MHz antenna

Not included are

- 3V power supply or battery and cable
- Xplained Pro SAMD20 or SAMD21 evaluation kit
- USB cable

Table of Contents

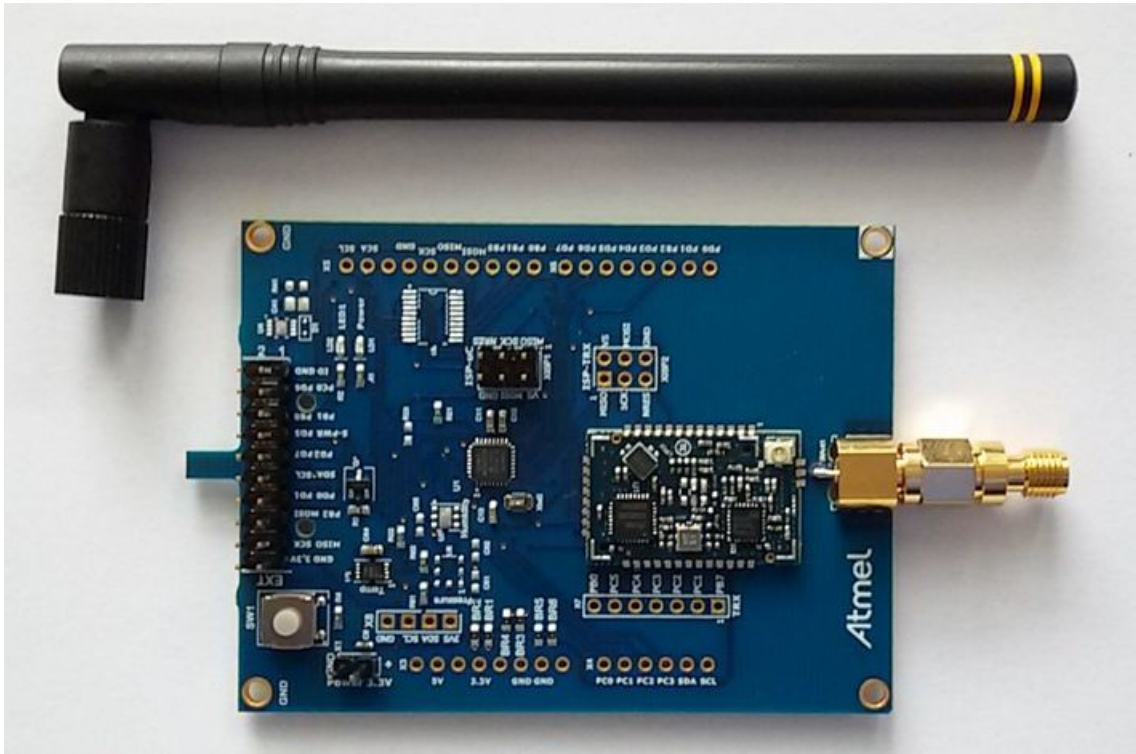
- Kit Content..... 1
- 1. ATA8520-EK1-F Standalone Kit..... 3
 - 1.1. Compliance Statements..... 4
- 2. ATA8520-EK3-F Xplained Pro Extension Board..... 6
- 3. SIGFOX Kit Activation..... 8
- 4. Revision History..... 9

1. ATA8520-EK1-F Standalone Kit

The Atmel® ATA8520-EK1-F evaluation kit is for demonstrating Atmel's RF SIGFOX™ compliant ATA8520E device and includes a

- Single PCB ATAB0102A-V1.0 with
 - Atmel ATA8520E SIGFOX transceiver device
 - Atmel ATmega328P AVR® microcontroller at 8MHz
 - Atmel AT30TS75A temperature sensor with TWI
- 902MHz monopole antenna to be connected to the RP-SMA connector

Figure 1-1. Atmel ATA8520-EK1-F



The devices are preprogrammed, i.e.

- The Atmel ATA8520E device is preprogrammed with the SIGFOX ID and PAC registration code (see label attached on the PCB) to register the kit within the user's SIGFOX back-end account. (The user has to open an account for the SIGFOX cloud to have access to the back end. For more information, see <http://www.sigfox.com>.)
- The Atmel ATmega328P includes a Flash application to read out the temperature sensor and to control transmission within the SIGFOX network. This requires a SIGFOX base station to be in range to capture the RF telegram.

Not included in the kit is a battery or external power supply for 3.0V to 3.3V at 300mA. This power supply has to be connected to connector X1. (Please observe correct polarity! There is no protection against incorrect polarity!)

The SIGFOX data transmission is repeated at 15 minutes intervals with the temperature and battery voltage value transmitted as long as the kit is powered. In addition a transmission can be triggered by pressing the SW1 button. The red LED flashes for about 2-3s during transmission of the SIGFOX telegram.

A tool pack for this kit is available for download from <http://www.atmel.com/devices/ATA8520E.aspx> and includes

- The ATAN0157 kit quick start guide and ATAN0156 user guide
- The schematic, layout and Gerber data for the ATAB0102A PCB
- The source code for the ATmega328P as an Atmel Studio 6 project

An AVR[®] debugger (JTAGICE3 or Atmel ICE) and Atmel Studio 6 are required for application development.

The kit is preprogrammed and temperature calibrated to operate at room temperature (24°C). For operation with a wider temperature range a temperature calibration as described in “ATAN0142 - ATA8520D Crystal Calibration” has to be applied.

1.1. Compliance Statements

The Atmel[®] ATA8520-EK1-F kit is designed to be used for standalone operation and not to be integrated into systems and devices.

This kit complies with Part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

1. this device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage, et
2. l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Changes or modifications made to this equipment not expressly approved by Atmel may void the FCC authorization to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with FCC and IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20cm de distance entre la source de rayonnement et votre corps.

Ce transmetteur ne doit pas être placé au même endroit ou utilisé simultanément avec un autre transmetteur ou antenne.

2. ATA8520-EK3-F Xplained Pro Extension Board

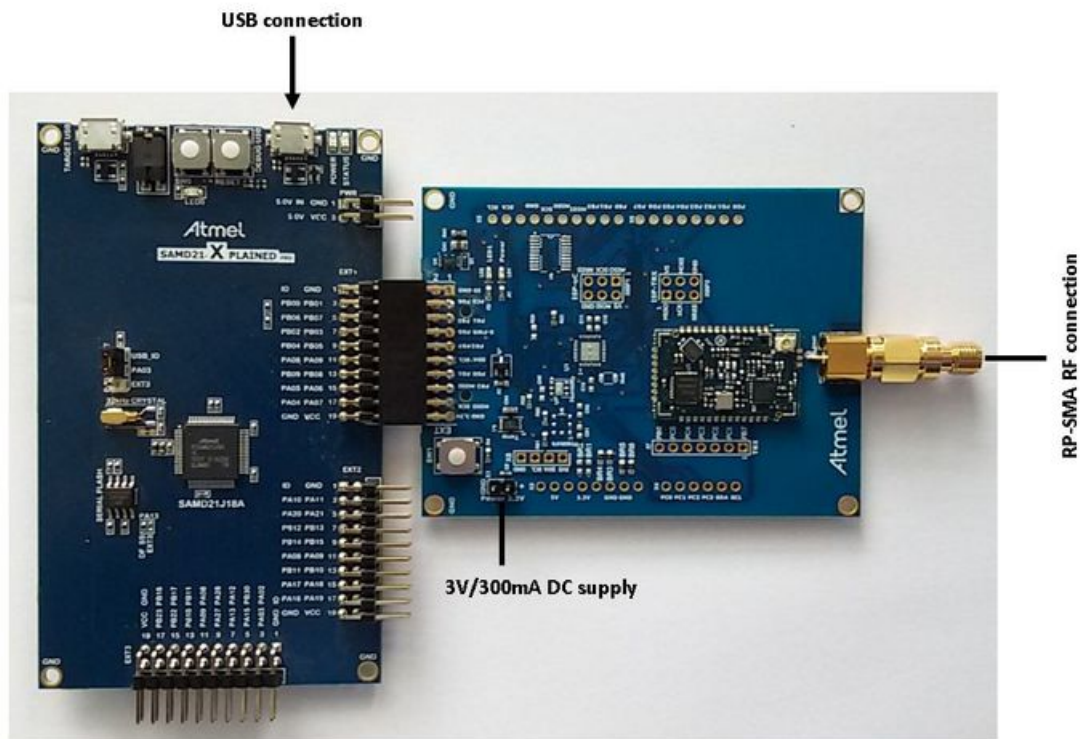
The ATA8520-EK3-F Xplained Pro extension is an extension board for Atmel®'s Xplained Pro development kits. Included in this kit are a

- Single PCB ATAB0102A-V1.0 with
 - Atmel ATA8520E SIGFOX transceiver device
 - Atmel AT30TS75A temperature sensor with TWI
 - Xplained Pro and RP-SMA connector
- 902MHz monopole antenna to be connected to the RP-SMA connector

The Xplained Pro development kit is not included and must be ordered separately. Figure 2-1 shows the ATAB0102A PCB attached to a SAMD21 Xplained Pro kit.

A separate power supply with 3V/300mA must be connected to connector X1 to supply the RF module. This power supply must be connected before starting the software application in the Xplained Pro kit.

Figure 2-1. ATA8520-EK3-F Xplained Pro Extension



The Atmel ATA8520E device is preprogrammed with the SIGFOX ID and PAC registration code (see label attached on the PCB) to register the kit within the user's SIGFOX back-end account.

A sample application is supplied with the tool pack zip folder for the SAMD21 Xplained Pro. This application reads the temperature sensor and controls transmission within the SIGFOX network. This requires a SIGFOX base station to be in range to capture the RF telegram.

A tool pack zip folder for this kit is available for download from <http://www.atmel.com/devices/ATA8520E.aspx> and includes

- The Atmel ATAN0157 kit quick start guide and the Atmel ATAN0156 user guide
- The schematic, layout and Gerber data for the ATAB0102A PCB

- The source code for the Xplained Pro with Atmel SAMD21 as an Atmel Studio6 project

Atmel Studio 6 must be installed before connecting the Xplained Pro kit. See additional instructions provided with the Xplained Pro kit. No additional debugger is required because this is integrated on the Xplained Pro. The Xplained Pro also provides a virtual COM port which is used by the Flash application together with a PC terminal application (TeraTerm, HTerm, etc.) to print or read ASCII messages. Use the following COM port settings for communication: 38.4kBaud, 8bit, 1 stop, no parity.

The board is preprogrammed and temperature calibrated to operate at room temperature (24°C). For operation with a wider temperature range a temperature calibration as described in “ATAN0142 - ATA8520D Crystal Calibration” has to be applied.

3. SIGFOX Kit Activation

The evaluation kit and extension boards include a one year SIGFOX™ platinum level subscription fee with

- support for the US version of the kit (for Europe)
- up to 140 up-link messages per day and device
- up to 4 down-link messages per day and device (not supported with this kit)

To activate the device and the kit send an email with the device ID no. to subscribe@sigfox.com to get the access information for the SIGFOX backend server. Within the SIGFOX backend server the kit can be registered using the ID and PAC code printed on the PCB (leave the certification no. empty). In addition the device data send to the SIGFOX cloud can be retrieved following the help information which is available after login.

4. Revision History

Please note that the following page numbers referred to in this section refer to the specific revision mentioned, not to this document.

Revision No.	History
9413B-06/16	<ul style="list-style-type: none">• Figure 1-1 "Atmel ATA8520-EK1-F" on page 3 updated• Figure 2-1 "ATA8520-EK3-F Xplained Pro Extension" on page 6 updated



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