

Atmel AT01778: Getting Started with SAM4L

Atmel SAM4L

Features

- Getting started with SAM4L device and tools
- SAM4L-EK and SAM4L Xplained Pro getting started
- Atmel Studio 6.1 getting started

Description

This application note aims at helping the reader to get start with the Atmel[®] ARM[®] Cortex[®]—M4 based SAM4L microcontroller.

1. Get SAM4L Datasheet

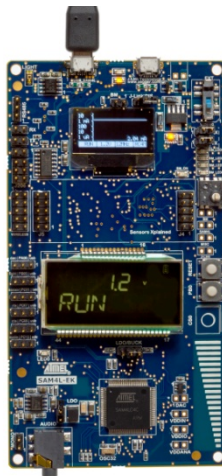
Web page: www.atmel.com/products/microcontrollers/arm/sam4l.aspx?tab=documents

Document: SAM4L Series Datasheet (complete, summary) (.pdf)

- Select the required device (i.e., ATSAM4Lx) or and get the latest datasheet (.pdf file). There are two versions:
 - complete version (includes all peripherals description and electrical characteristic)
 - summary version

2. Get SAM4L Evaluation Kits

2.1 Get SAM4L-EK



Web page: <http://www.atmel.com/tools/SAM4L-EK.aspx>

Get the kit: <http://store.atmel.com/>

Document/file:

- SAM4L-EK gerber files: schematics (.pdf), gerber, BOM, errata
- SAM4L-EK User Guide application note (.pdf)
- SAM4L schematic checklist application note (.pdf)

Key Features:

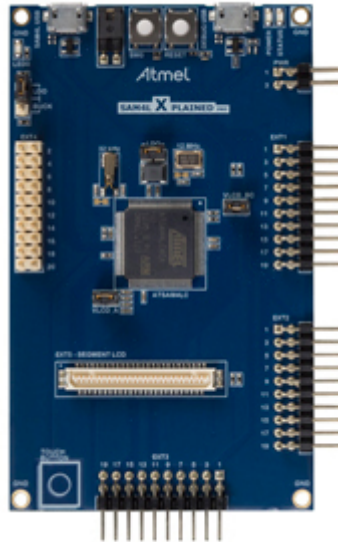
- SAM4LC4C Cortex-M4 device
- Board monitor with OLED color display, power measurement stage for ATSAM4LC4C power, joystick and five LEDs
- Segger J-Link OB Module (embedded debugger)
- QTtouch slider and button
- Segment LCD (4x40)
- USB host and device
- Wireless 10-pin interface
- SPI serial Flash (AT25DF641A)
- Sensor Xplained support

- Light sensor
- Reset push button
- Audio jack connector
- User input push button
- RS485 connector

SAM4L-EK comes with a preloaded firmware which demonstrates the low power and QTouch capability of the product. The demo is available in Atmel Software Framework (ASF).

SAM4L-EK User Guide application note covers how to power the kit, the firmware demonstration workflow and the board/schematics guide.

2.2 Get SAM4L Xplained Pro Kits



Web page: <http://www.atmel.com/tools/ATSAM4L-XPRO.aspx>

Get the kit: <http://store.atmel.com/>

Document/file:

- SAM4L Xplained Pro User Guide application note (.pdf)

Key Features:

- SAM4LC4C microcontroller
- One mechanical reset button
- One mechanical user pushbutton (wake-up, bootloader entry or general purpose)
- One QTouch button
- One yellow user LED
- USB interface, host and device function (shared physical interface)
- 32.768kHz crystal
- 12MHz crystal
- 4 Xplained Pro extension headers
- One custom extension header for segment LCD displays
- LDO/Buck regulator mode selection
- LCD cluster power configuration option
- Embedded Debugger
 - Auto-ID for board identification in Atmel Studio 6.1
 - One yellow status LED
 - One green board power LED
 - Symbolic debug of complex data types including scope information

- Programming
- Data Gateway Interface: USART, TWI, 4 GPIOs
- Virtual COM port (CDC)
- USB powered
- Supported with application examples in Atmel Software Framework

SAM4L Xplained Pro User Guide application note covers how to power the kit, the detailed information of the on-board components, extension interface and the hardware guide.

Please note that there is SAM4L8 Xplained Pro, which mounts SAM4LC8C chip. For the difference between two devices, please refer to the SAM4L series datasheet for more details.

3. Get the Tools

Atmel Studio 6.1 is the preferred IDE to get started with the SAM4L device and GCC compiler. IAR™ compiler is supported as well.

3.1 Get Atmel Studio 6.1

Web page: http://www.atmel.com/microsite/atmel_studio6/default.aspx

Document/file:

- Atmel Studio 6.1 installer (.exe), the latest version

Atmel Studio 6.1 is the IDE for developing and debugging the SAM4L microcontroller with GCC compiler.

3.2 Get IAR Embedded Workbench for ARM

Web page: <http://www.iar.com/en/Products/IAR-Embedded-Workbench/ARM/>

Document/file: IAR Embedded Workbench for ARM installer, the latest version

Web page: <http://www.atmel.com/tools/SAM4L-EK.aspx> or <http://www.atmel.com/tools/ATSAM4L-XPRO.aspx>

Document/file: IAR add-on installer for SAM4L

3.3 Get SAM4L-EK Embedded Debugger Software (SAM4L-EK only)

Web page: <http://www.segger.com/jlink-software.html>

Document/file: J-Link software

This software is required to use the SAM4L-EK embedded debugger Segger J-Link OB with IAR IDE.

3.4 Get Atmel Software Framework (ASF)

Web page: <http://www.atmel.com/tools/AVRSOFTWAREFRAMEWORK.aspx>

Document/file:

- Atmel Software Framework, the latest version

ASF online documentation for available API and examples can be found at <http://asf.atmel.com>.

4. Atmel Studio 6.1 Users Getting Started

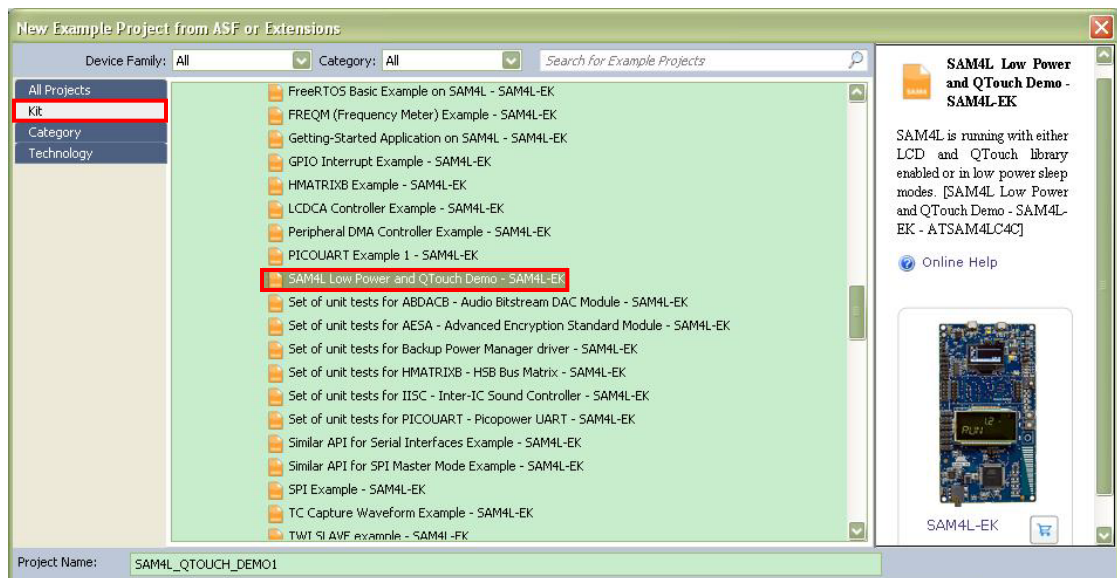
4.1 Using SAM4L-EK

Requirements:

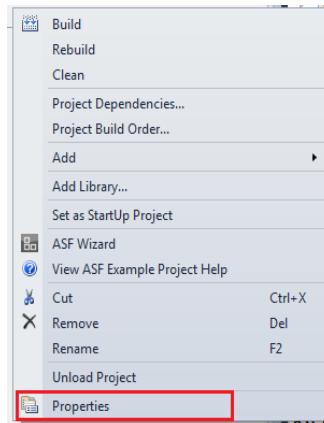
- Atmel Studio 6.1 (the latest version) installed
- ASF (the latest version) installed
- SAM4L-EK board connected to Atmel Studio 6.1 through the embedded debugger USB connector (open the J-Link DIS jumper). The kit will be powered by the USB

Get Started with Atmel Studio 6.1, ASF and SAM4L-EK:

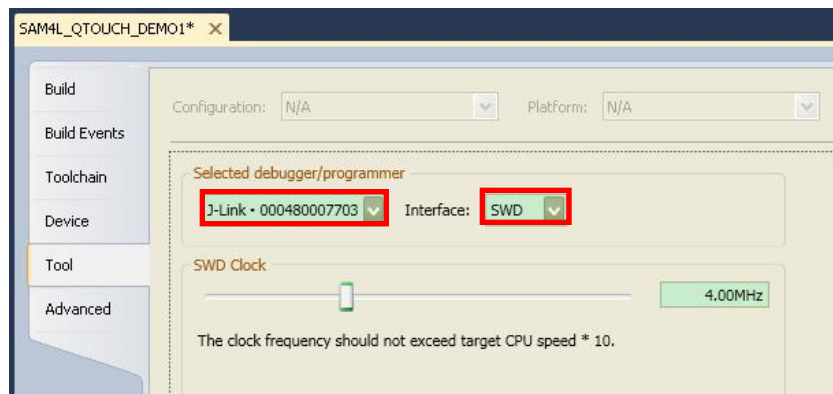
- Launch Atmel Studio 6.1
- Connect the SAM4L-EK USB Embedded Debugger connector to the PC
- To start ASF examples, File -> New -> Example Project
- Select the “kit” view and select SAM4L-EK
- Pick one of the examples (e.g., SAM4L Low Power and QTouch Demo), press OK and accept the license agreement. Then the project will be created and opened.



- Right-click on the project, select Properties



- In Tool view, set selected debugger/programmer to J-Link and set the interface to “SWD”



- Build the project: Build->Build solution (shortcut: F7)
- To load the code in the SAM4L and debug, click on Debug->Start debugging and break (ALT+F5)
- The application is programmed and the debugger breaks in main.
To run the code, click on Debug->Continue (F5)

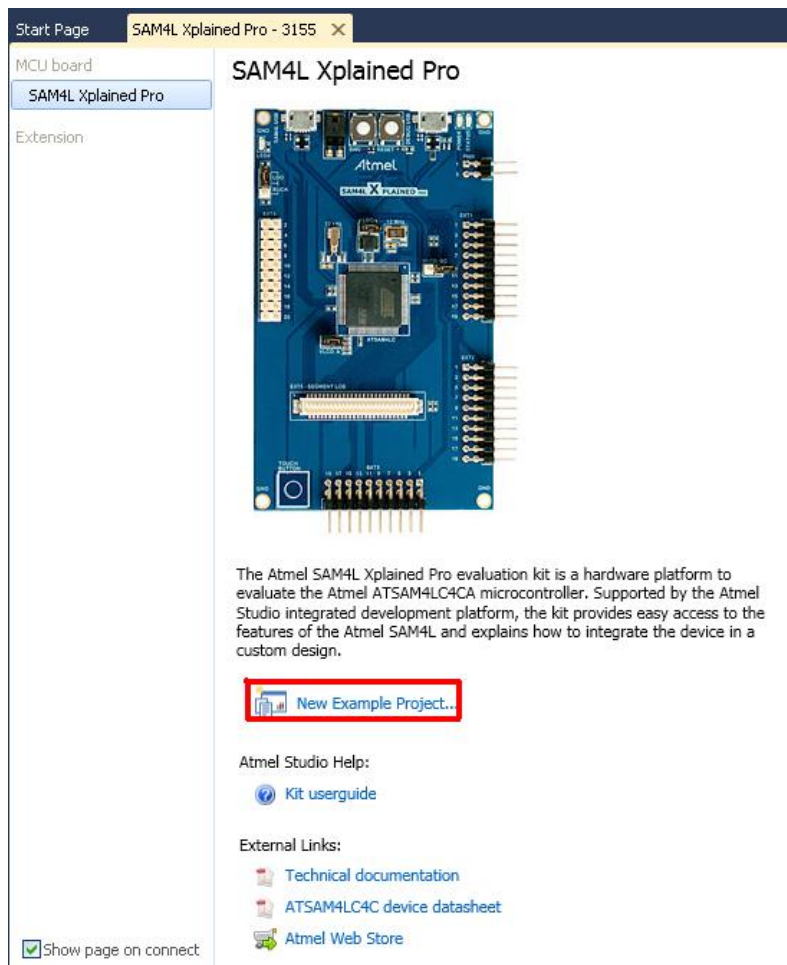
4.2 Using SAM4L Xplained Pro Kits

Requirements:

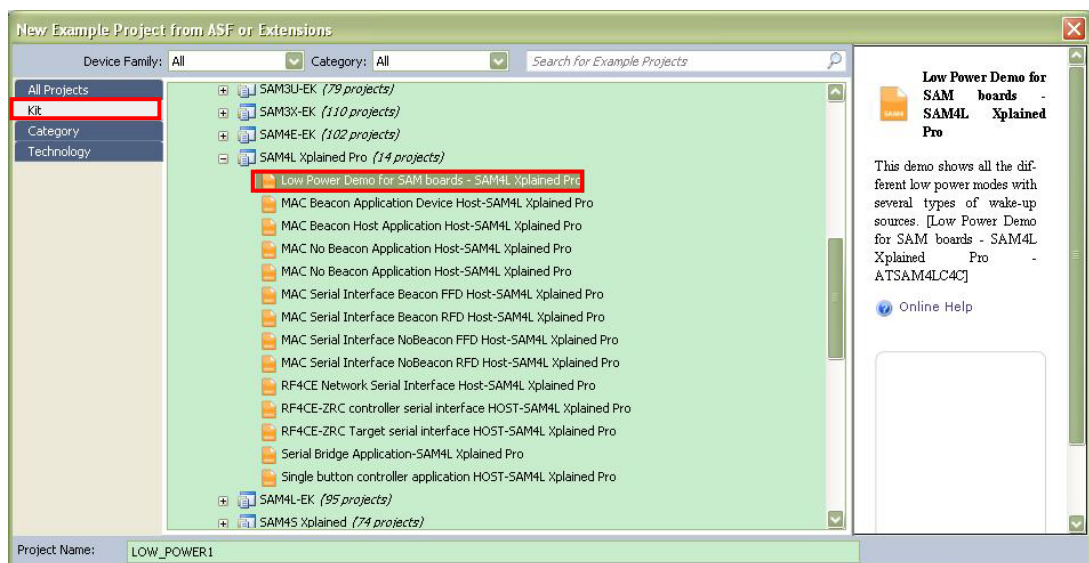
- Atmel Studio 6.1 (the latest version) installed
- ASF (the latest version) installed
- Close the jumpers on the board and select LDO power mode, please refer to SAM4L Xplained Pro User Guide for the detailed jumper description
- SAM4L Xplained Pro connected to Atmel Studio 6.1 through the embedded debugger USB connector (DEBUG USB port on the board). The kit will be powered by the USB

Get Started with Atmel Studio 6.1, ASF and SAM4L Xplained Pro:

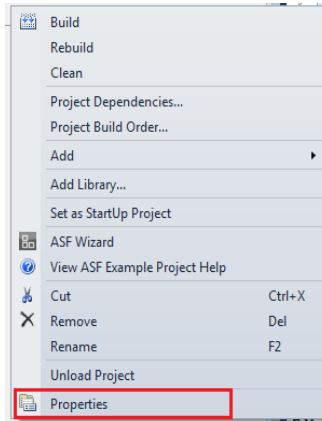
- Launch Atmel Studio 6.1
- Connect the SAM4L Xplained Pro USB Embedded Debugger connector to the PC. Then the following page shows.



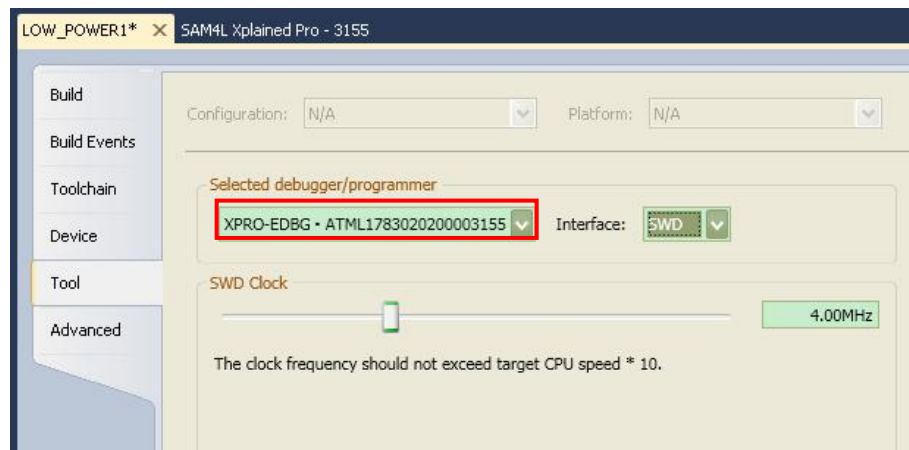
- To start ASF examples, Click “New Example Project...”
- Select the “kit” view and select SAM4L Xplained Pro
- Pick one of the examples (e.g., Low Power Demo for SAM boards), press OK and accept the license agreement. Then the project will be created and opened.



- Right-click on the project, select Properties



- In Tool view, set selected debugger/programmer to XPRO-EDBG.



- Build the project: Build->Build solution (shortcut: F7)
- To load the code in the SAM4L and debug, click on Debug->Start debugging and break (ALT+F5)
- The application is programmed and the debugger breaks in main.
To run the code, click on Debug->Continue (F5)

5. What next

- Atmel Studio videos: www.atmel.com/atmelstudio
- Atmel Studio Help: Help->View Help (Ctrl+F1)
- ASF Getting Started: www.atmel.com/asf
- ASF on-line documentation: <http://asf.atmel.com>
- ASF Reference manual: www.atmel.com/asf

Appendix A. Revision history

Doc. rev.	Date	Comments
42024A	09/2012	Initial document release
42024B	05/2013	Updated the content of SAM4L-EK and added SAM4L Xplained Pro information Renamed from AVR4036 to AT01178 Cortex™ updated to Cortex®



Atmel Corporation

1600 Technology Drive
San Jose, CA 95110
USA

Tel: (+1)(408) 441-0311

Fax: (+1)(408) 487-2600

www.atmel.com

Atmel Asia Limited

Unit 01-5 & 16, 19F
BEA Tower, Millennium City 5
418 Kwun Tong Road
Kwun Tong, Kowloon
HONG KONG

Tel: (+852) 2245-6100

Fax: (+852) 2722-1369

Atmel Munich GmbH

Business Campus
Parking 4
D-85748 Garching b. Munich
GERMANY

Tel: (+49) 89-31970-0

Fax: (+49) 89-3194621

Atmel Japan G.K.

16F Shin-Osaki Kangyo Building
1-6-4 Osaki
Shinagawa-ku, Tokyo 141-0032
JAPAN

Tel: (+81)(3) 6417-0300

Fax: (+81)(3) 6417-0370

© 2013 Atmel Corporation. All rights reserved. / Rev.: 42024B–SAM4L–05/2013

Atmel®, Atmel logo and combinations thereof, AVR®, Enabling Unlimited Possibilities®, QTouch®, and others are registered trademarks or trademarks of Atmel Corporation or its subsidiaries. ARM®, Cortex® and others are registered trademarks or trademarks of ARM Ltd. Other terms and product names may be trademarks of others.

Disclaimer: The information in this document is provided in connection with Atmel products. No license, express or implied, by estoppel or otherwise, to any intellectual property right is granted by this document or in connection with the sale of Atmel products. EXCEPT AS SET FORTH IN THE ATMEL TERMS AND CONDITIONS OF SALES LOCATED ON THE ATMEL WEBSITE, ATMEL ASSUMES NO LIABILITY WHATSOEVER AND DISCLAIMS ANY EXPRESS, IMPLIED OR STATUTORY WARRANTY RELATING TO ITS PRODUCTS INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. IN NO EVENT SHALL ATMEL BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, PUNITIVE, SPECIAL OR INCIDENTAL DAMAGES (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS AND PROFITS, BUSINESS INTERRUPTION, OR LOSS OF INFORMATION) ARISING OUT OF THE USE OR INABILITY TO USE THIS DOCUMENT, EVEN IF ATMEL HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. Atmel makes no representations or warranties with respect to the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and products descriptions at any time without notice. Atmel does not make any commitment to update the information contained herein. Unless specifically provided otherwise, Atmel products are not suitable for, and shall not be used in, automotive applications. Atmel products are not intended, authorized, or warranted for use as components in applications intended to support or sustain life.