

# MXMEXB Document

## Overview

**Mini XMega Experiment Board (MXMEXB)** is a very simple starter kit for developing code and making small prototypes with the Atmel ATXMega microcontroller. It is very easy to try out different kinds of sensor, components and extensions by utilizing the integrated breadboard.

## Features

- Atmel ATXMega32A4U microcontroller
- USB interface for downloading user programs and for serial interface
- Powered from USB bus protected with a fuse and a diode
- PDI-programming and debugging interface
- 4 push-buttons
- 4 LEDs
- 170 connection point breadboard for prototyping
- I/O ports accessible through pin header connectors (excluding those connected to switches and LEDs)
- Pre-programmed boot loader and a default test software
- Easily reprogrammed with USB cable and the pre-programmed boot loader
- Debugging and programming via PDI-interface with Atmel JTAGICE mkII, AVR Dragon, JTAGICE3, and AVR ONE! debugging tools.
- Can be optionally programmed with Atmel ISP mkII In-System Programmer

## Quick Start

**You will need a mini-USB cable connected between the MXMEXB and a PC.** Power is applied by the USB connector and the PWR LED on the board will light up.

### *What is needed to test functioning of the MXMEXB?*

- When you connect USB cable the pre-programmed test program will start automatically. Try the push buttons on the card and watch the test programs response from LEDs.

### *What is needed to download other programs to the MXMEXB?*

The pre-programmed boot loader on the MXMEXB offers the possibility to program the XMEga micro-controller directly from the USB interface.

- To download programs to MXMEXB, **you need the Atmel's Flip program** (Flexible In-system Programmer). Download the FLIP program from Atmel web site:  
<http://www.atmel.com/tools/FLIP.aspx>
- Install FLIP and read it's instructions
- Download more ready-made test programs from: [www.tietomyrsky.fi/mxmexb/](http://www.tietomyrsky.fi/mxmexb/)

The boot loader on the MXMEXB is evoked by pushing the push button SW1 during power-on reset. When the pre-programmed boot loader starts for the first time, Windows will ask for a driver. The driver comes with Flip program. You need to install the DFU driver which comes with the Flip software package. This needs to be done only once.

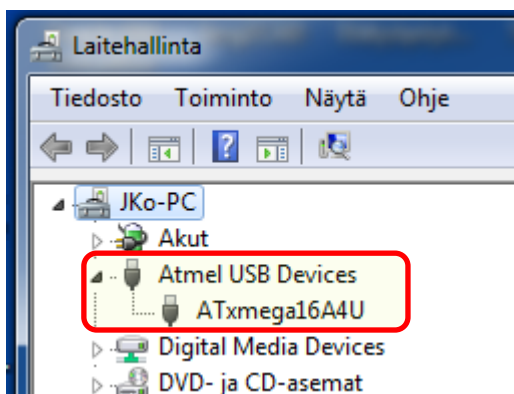
- Disconnect the USB cable from the MXMEXB (or from the PC, whichever is easier)
- Push the SW1 button and hold the button down while connecting the USB cable to the MXMEXB.



Windows doesn't find the driver automatically and you have to instruct the installer to look it from the directory under which Flip was installed.

Load the document: **Atmel AVR1916: USB DFU Boot Loader for XMEGA** from Atmel's www-site for detailed instructions on installing the driver on Windows XP, Windows Vista and Windows 7.

Check from the Device Manager that the driver was installed correctly. You should now repeat booting of the board with the SW1 held down to see that the DFU (Device Firmware Upgrade) device is correctly recognized. You should see an Atmel USB Device similar to one in the picture below when the board is in the bootloader mode.



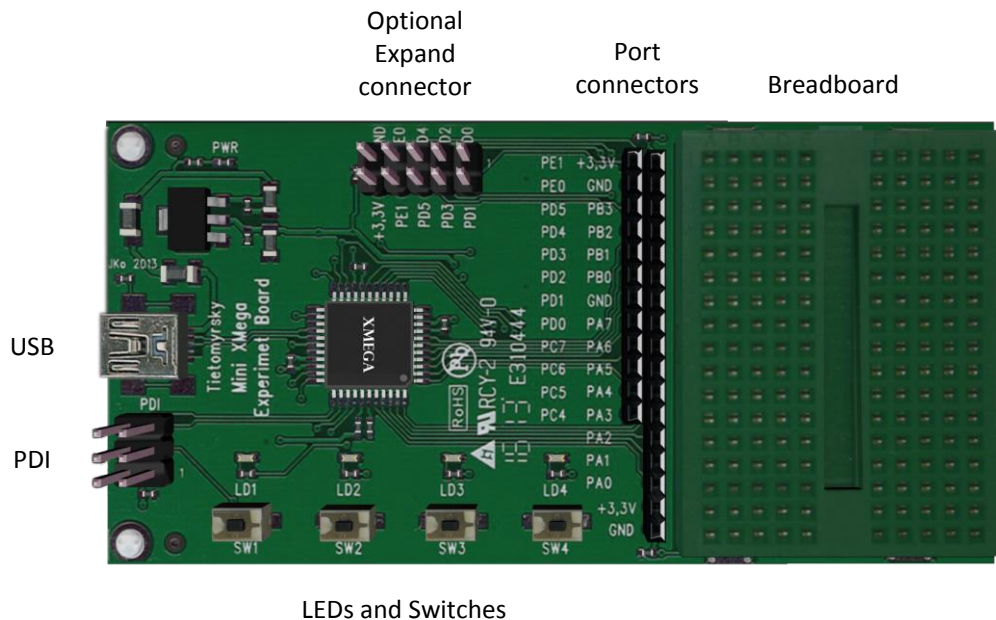
Note that if the board is booted normally, i.e. SW1 not held down during power on reset, the bootloader will not be started. In that case no Atmel USB Device will be shown in Device Manager and the application loaded by the user will start and the USB interface will be controlled by that application and can be used for example as a serial interface.

## Board layout

MXMEXB board is powered by the PC via the USB interface and the USB cable should always be connected to a PC or a 5V USB power supply.

**Warning:** Do not try to power the board via any connector from external power supply.

Figure 1. Board layout



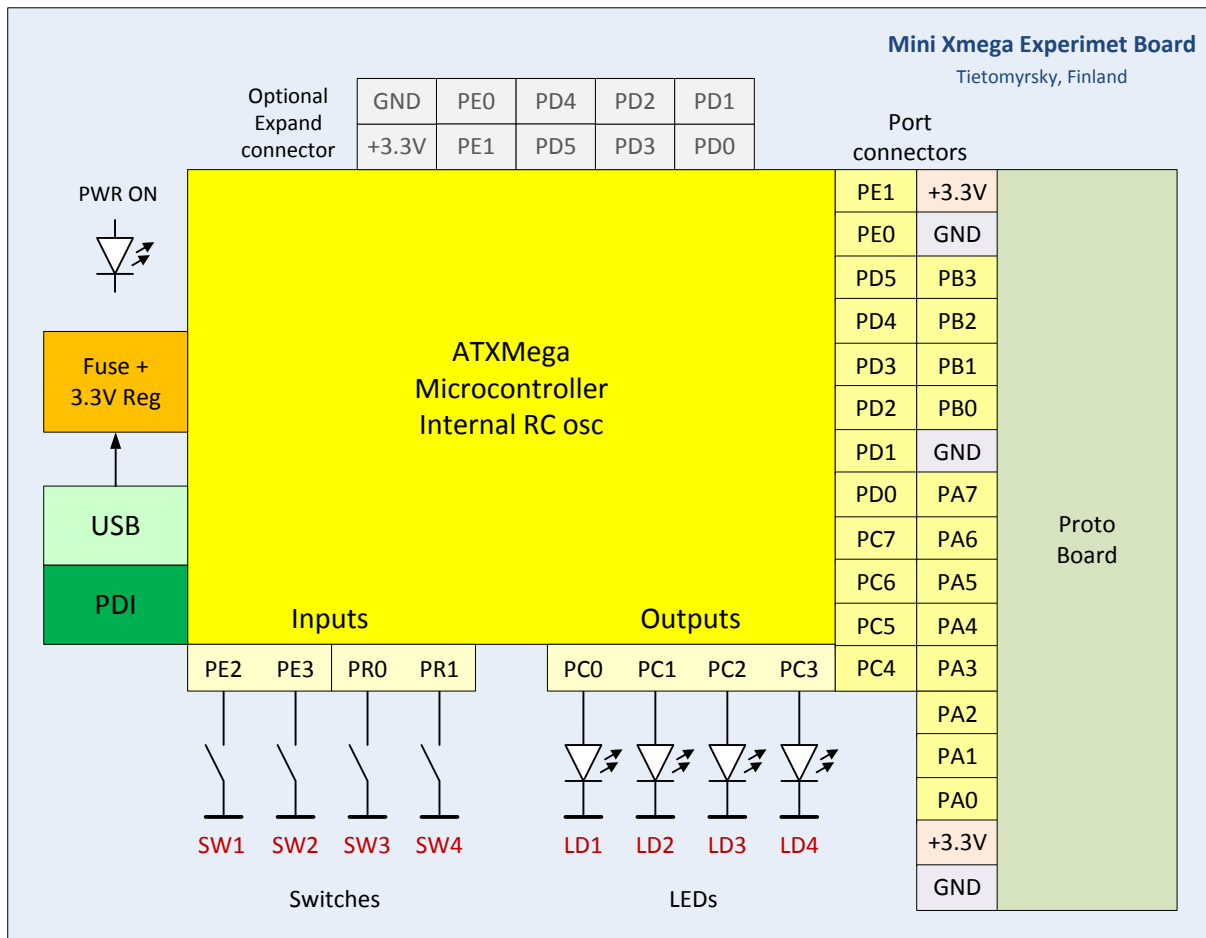
MXMEXB board can optional programmed via a 6-pin PDI connector.

## Breadboard

The breadboard of the MXMEXB board can be used to develop and test small prototype circuits. You can get the needed power (3.3 V) and GND signals from port connector besides the breadboard. The 3.3 V power is regulated and protected against short circuits and reverse current with a resettable PTC fuse and a diode. In overcurrent situation PTC fuse heats up. When the fault is removed, the PTC fuse will cool. PTC fuse starts to limit current when it reaches about 200 mA. All I/O port pin signals of XMEga microcontroller, excluding those connected to switches and LEDs, are routed to port connector. The pinout of the port connector is shown in Figure 2.

**Only use components that can be powered from a 3.3 V power supply.**

Figure 2. Block diagram of the MXMEXB evaluation board.



## Program development

To create programs to MXMEXB board Tietomyrsky recommends Atmel's free tools: The **Atmel Studio 6** integrated development environment (IDE). This IDE contains everything you need to create, compile and debug code. It also includes a programming utility for programming Atmel devices with a variety of tools like AVR ISP mkII, AVR Dragon, JTAGICE3, and AVR ONE!. Download the Atmel Studio IDE from Atmel web site: <http://www.atmel.com/>.

## Recommended reading

- XMEGA AU manual
- XMEGA A3U datasheet
- XMEGA application notes
- Atmel AVR1916: USB DFU Boot Loader for XMEGA