



Mataki-Lite Programming Guide

Version 1

This document describes how to set up and use the software and hardware to load firmware onto a Mataki-Lite tag. This guide assumes you are using an LPC-Link2 programmer and the free utility Flash Magic on a Windows PC.

Version History

Version	Date	Changes
1	28 Feb 2018	First Release

Related Documents

Mataki-Lite User Guide
Mataki Support Board User Guide

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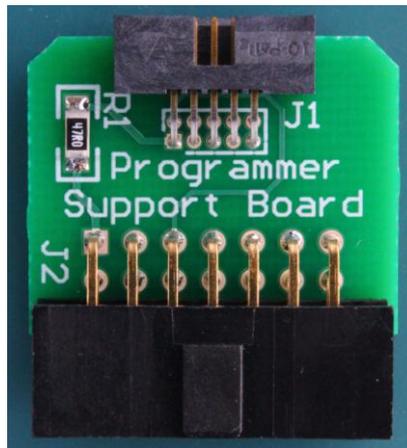
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1. Hardware

1.1. Required Hardware

There are three pieces of hardware required to program a Mataki-Lite board:

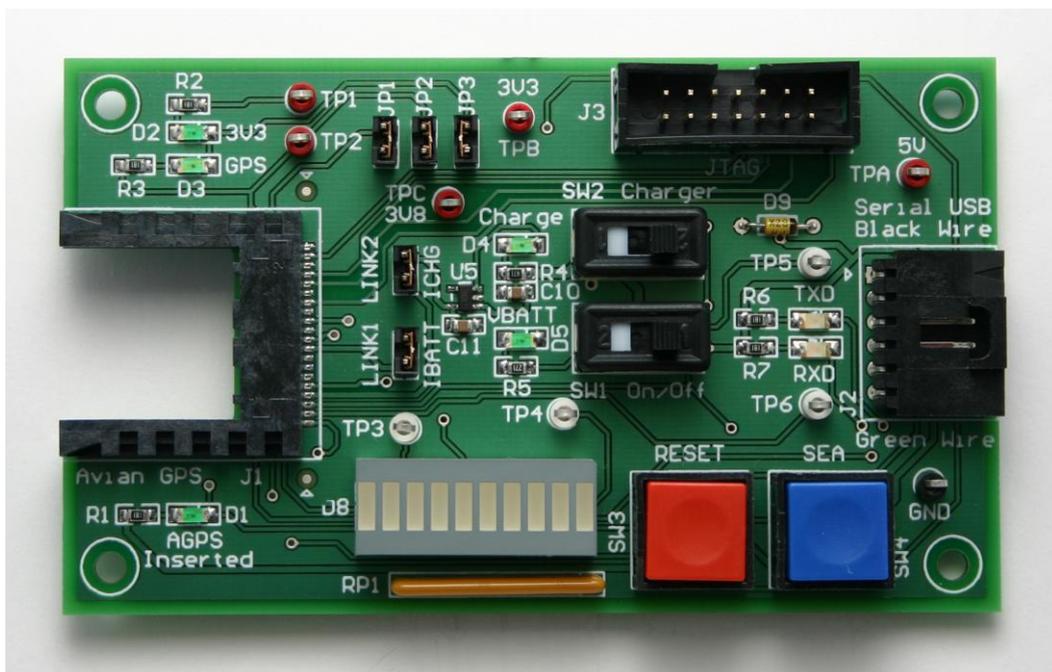
- **LPC-Link2**
 - This is the NXP programmer used for the LPC1549 microprocessor on Mataki-Lite tags
 - It connects to a PC via a mini-USB to USB-A cable
 - It connects to the support board with a 10-way high density ribbon cable via the programming adaptor
- **Programming Adaptor Board**
 - This is an adaptor for the 10-way high density ribbon cable coming from the LPC-Link2 to the programming interface on the Mataki support board



Programming Adaptor

- **Mataki Support Board**

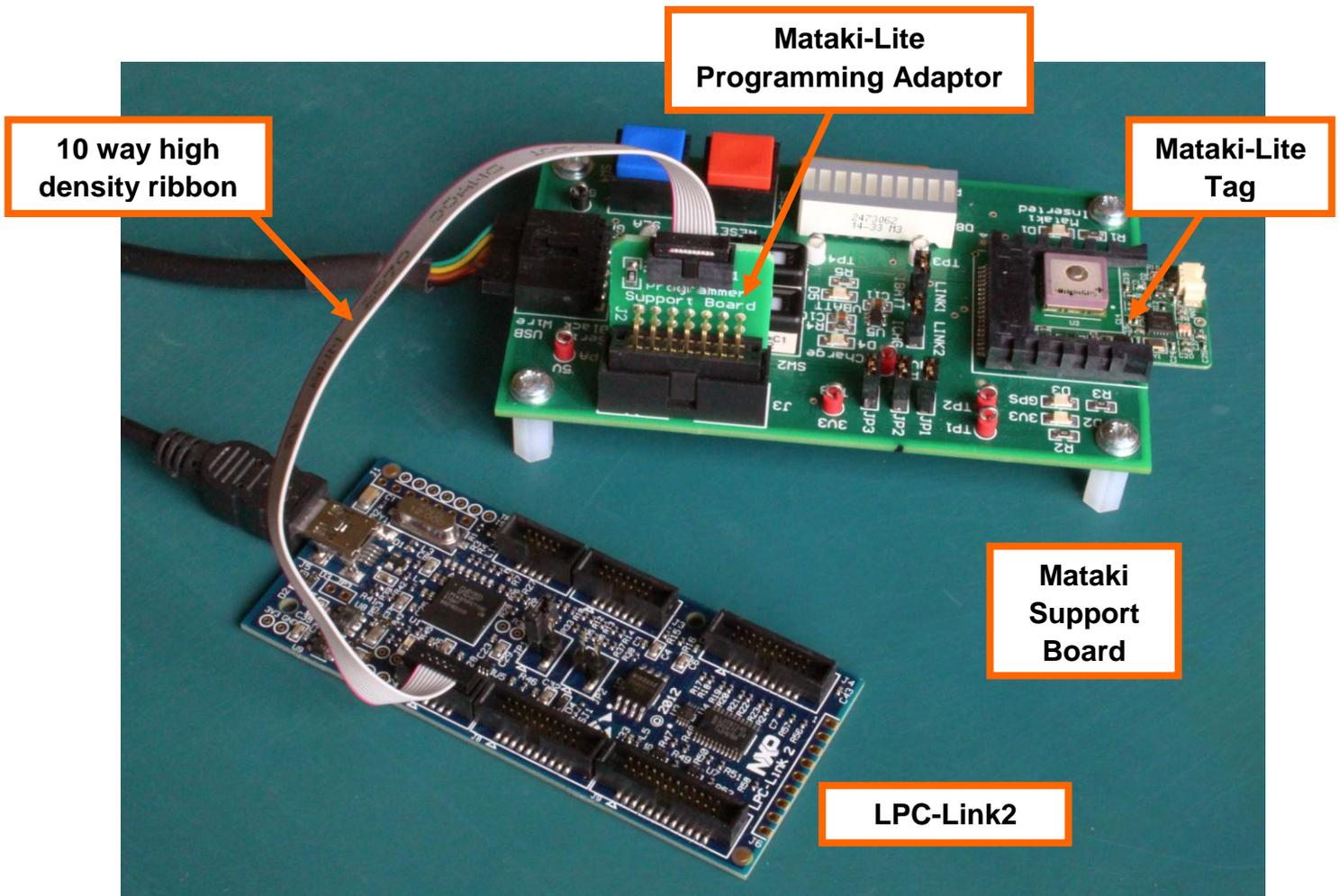
- This provides an interface between the LPC-Link2 and the Mataki-Lite tag
- The connectors seen in the image below are:
 - J1 (Also labelled 'Avian GPS') is where the Mataki-Lite is inserted
 - J2 (Also labelled 'Serial USB') is where the FTDI serial USB cable is inserted to connect the support board to the PC
 - J3 (Also labelled with 'JTAG') is the programming interface
- See the Mataki Support Board User Guide for more information



Mataki Support Board

1.2. Hardware Setup

A typical configuration for the hardware required to program a tag looks like this:



2. Installing and Configuring Flash Magic

In order to load firmware onto a tag, a flash loader utility is required. The chosen tool for this is Flash Magic from the Embedded Systems Academy (version 10.90.4893 was used at the time of publication).

2.1. Installing Flash Magic

At the time of publication, the Flash Magic utility can be found at <http://www.flashmagictool.com/>. Download the application and follow the installation instructions.

Ensure that the checkbox labelled 'Install NXP LPC USB drivers' is checked, otherwise you'll be unable to use the LPC-Link2 to program the device.

If installing on Windows, the drivers may take some time to be properly installed in the background. This may take up to 30 minutes as Windows searches the online driver libraries. A PC reboot and restarting the Flash Magic application may help this. When they're installing, a notification should present itself from the side-panel saying something similar to 'Installing LPC drivers'.

2.2. Flash Magic Settings

There are a number of settings that need to be set before use. These include:

- **Device**
 - Hit button marked 'Select' to choose the device
 - Under 'Arm Cortex' select LPC1549
- **Interface**
 - Select 'SWD over Link2'
 - If this option is not available, then either the Link2 driver hasn't been installed correctly or the flash on the Link2 has been overwritten by another application. In the latter case unplugging the Link2 from the PC, plugging it back in, and restarting Flash Magic should solve the problem.
- **Erase Blocks**
 - The memory blocks to erase have to be manually specified in order to avoid deleting the stored settings in flash
 - Blocks 0-31 must all be selected
- **Verify after programming**
 - Check this box

Settings are preserved between sessions, however it is recommended that these settings are saved to a settings file so that in future they can be recalled if lost. This can be done by hitting the save icon in Flash Magic and exporting the settings to a .fms file.

3. Programming

To program the device with the new firmware, use the following steps (settings stored in flash and EMBASIC script are preserved after loading new firmware):

1. Ensure all hardware is connected
 - Support board and LPC-Link2 are plugged into the PC
 - LPC-Link2 is connected to the support board via the programming adaptor
 - Mataki-Lite is fully inserted into the support board
2. Open PuTTY terminal
3. Switch SW2 (charger) to on position to provide power to Mataki-Lite
 - If there is a script set to auto-run on the tag, it should be cancelled before programming by pressing 'C' in the PuTTY terminal when prompted
4. Use the 'Browse' button and select the new firmware binary file (ends with a .hex extension)
5. Press 'Start' to start programming the device
 - If presented with "can't find block 0" then power cycle the device and retry 2 or 3 times
 - Other issues may be fixed with a combination of:
 - Power cycling
 - Unplugging and reinserting the board
 - Adding a battery
6. When the indicator in the bottom says 'Finished' then the firmware has been successfully loaded
 - Reset the device and check the firmware version is correct (first line on start up, e.g. 'Mataki-Lite Radio Tracker Platform V1.2.2')