debug innovations 0101001101

Mataki-Classic Programming Guide

Version 1

This document describes how to set up the software and hardware required to load firmware onto a Mataki-Classic tag and then explains the firmware loading process. This guide uses an Olimex MSP programmer and the Olimex programming utility on a Windows PC.

Version History

Version	Date	Changes
1	28 Feb 2018	First Release

Related Documents

Mataki-Classic User Guide
Mataki Support Board User Guide

Contents

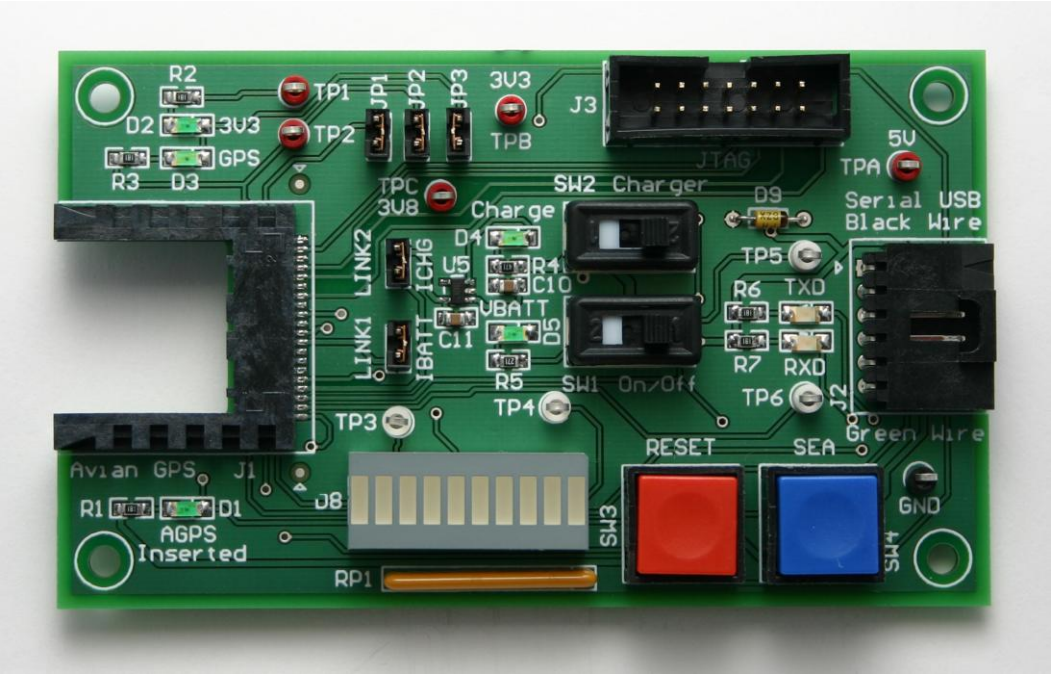
1. Hardware

1.1. Required Hardware

There are two pieces of hardware required to program a Mataki-Classic tag with new firmware:

- **An Olimex MSP430-JTAG-TINY-V2 Programmer**
    - This is the programmer used to load the firmware onto the MSP430 CPU used on Mataki-Classic tags
    - It connects to a PC with a USB cable
    - It connects to the support board with a 14 pin IDC ribbon cable connected to J3

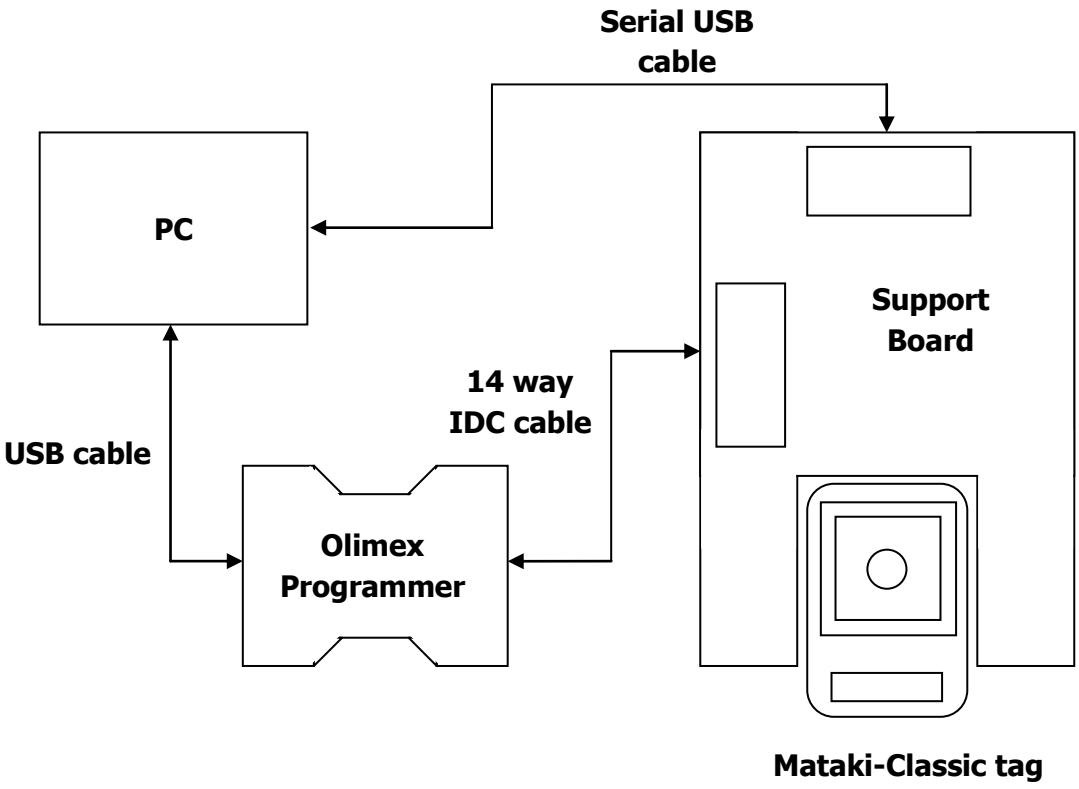
- **A Mataki Support Board**
    - This provides an interface between the Olimex programmer and the Mataki-Classic tag
    - The connectors seen in the image below are:
        - J1 (Also labelled 'Avian GPS') is where the tag is inserted
        - J2 (Also labelled 'Serial USB') is where the FTDI serial USB cable is inserted to connect the support board to the PC
        - J3 (Also labelled with 'JTAG') is the programmer connection



Mataki Support Board

1.2. Hardware Setup

A block diagram showing the wiring for the hardware is shown below:



2. Olimex Programmer Software

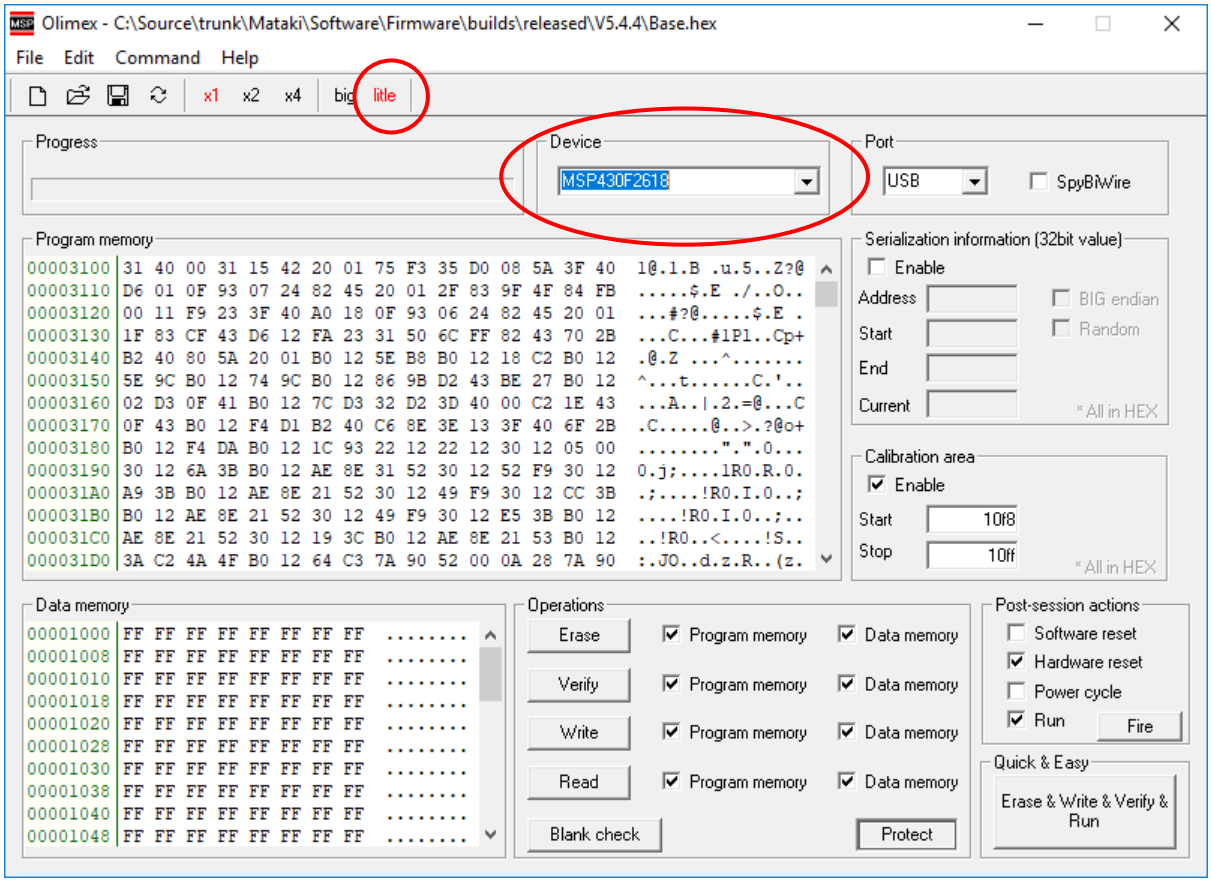
In order to program a tag, the flash loader utility for the Olimex programmer is required.

2.1. Installation

At the time of publication, both the drivers and software can be found at https://www.olimex.com/Products/MSP430/JTAG/MSP430-JTAG-TINY-V2/. Follow the instructions provided to install both of these.

2.2. Settings

The required settings can be seen below (in this example, the utility is loaded with a base configuration binary file):



The important settings circled in red are:

- Little endianness has been selected ('litle')
- The selected device is 'MSP430F2618'

3. Programming New Tag Firmware

WARNING

All the tag settings are erased when new firmware is loaded and will need reconfiguring. Ensure you know what settings you need before proceeding.

To program a tag with new firmware, use the following steps:

1. Ensure all the hardware is connected
   - Support board is plugged into the PC
   - Olimex programmer is plugged into the PC and the support board
   - A Mataki-Classic tag is fully inserted into the support board
2. Open a PuTTY terminal as per normal operation
3. Switch the red slide switch on the tag to the OFF position
4. Switch SW1 (power) on the support board to the ON position to power the tag. If the tag already has firmware loaded, it will startup as normal.
5. On the programmer software, click on the open file icon, navigate to the required firmware file (ends with a .hex extension) and open it. The 'Program memory' window contents will change to the new file contents.
6. Press 'Erase & Write & Verify & Run' to start programming the firmware (the large button in the bottom right hand corner)
7. The firmware will be written and verified then the tag will be reset. The progress bar will move across the screen as each stage happens. Check the correct firmware is now running by examining the startup messages.
8. Programming new firmware will erase all the tag settings. They will need to be set again - the most important ones are:
   - The tag ID (use the 'id' command)
   - The base radio frequency (use the 'fbase' command)
   - The tracker and sensor settings ('setgps', 'setradio' and 'setacc')