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MPQ USB Array Interface Board

User's Guide

Revision 1.0
August, 2010

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Table of Contents

1 Introduction

This documentation describes the MPQ USB Array Interface Board (MPQ-AIB-USB) and its use in building MPQ Arrays. The photo below identifies the parts used with the MPQ USB Array Interface Board.
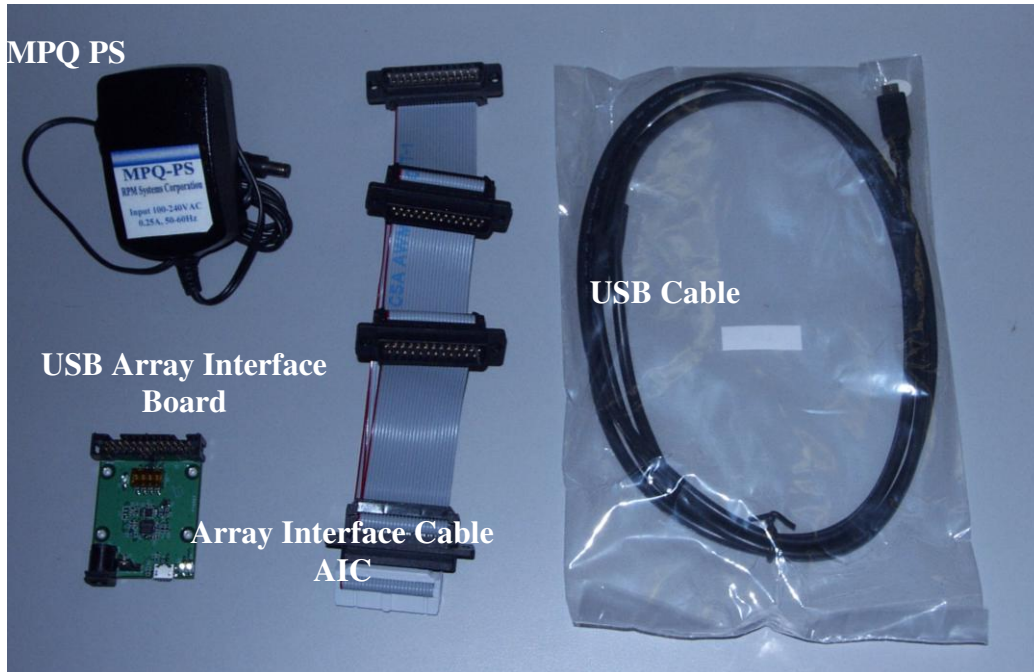

Figure 1

The parts used include that following:

- ▪ **MPQ PS**

- ▪ **USB Array Interface Board**

- ▪ **USB Cable**

- ▪ **MPQ-AIC-x (Array Interface Cable)***

*Note: The MPQ-AIC-x cable is made to order(x = the number of connectors). The one shown in Figure 1 is a MPQ-AIC-4 capable of supporting up to 4 MPQ Programmers.

2   Overview

The MPQ-AIB-USB provides the following functions:
Distribution if power to multiple MPQs
Distribution of control and communications signals to multiple MPQs
Switch-selectable image-selection control

2.1   Power distribution

The MPQ-AIB-USB provides three different power distribution options, configurable via a jumper selection on JP1. The configurations are:

1. **Option 1:** If JP1 is open (no pins are connected by the jumper), there is no power supplied to the MPQ programmers via the MPQ-AIB-USB, and separate power needs to be applied to each MPQ Programmer using a standard MPQ-PS power supply. This is the **default** setting and should be used if powering more than five programmers.
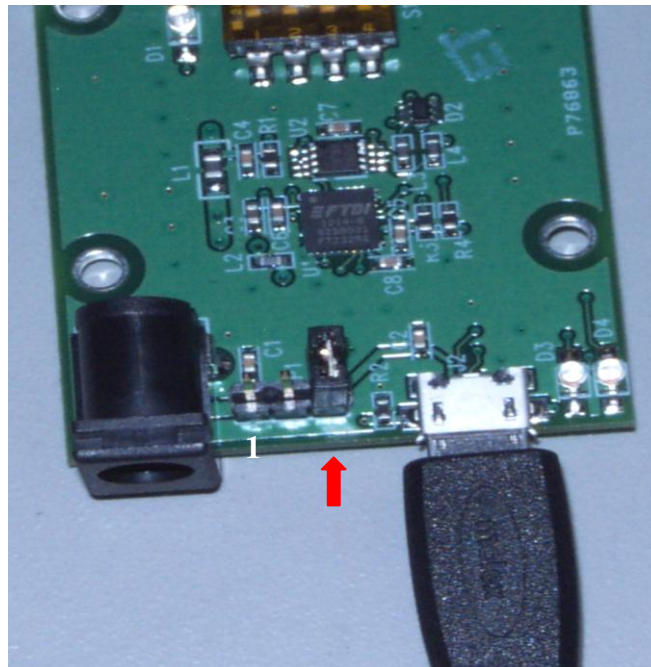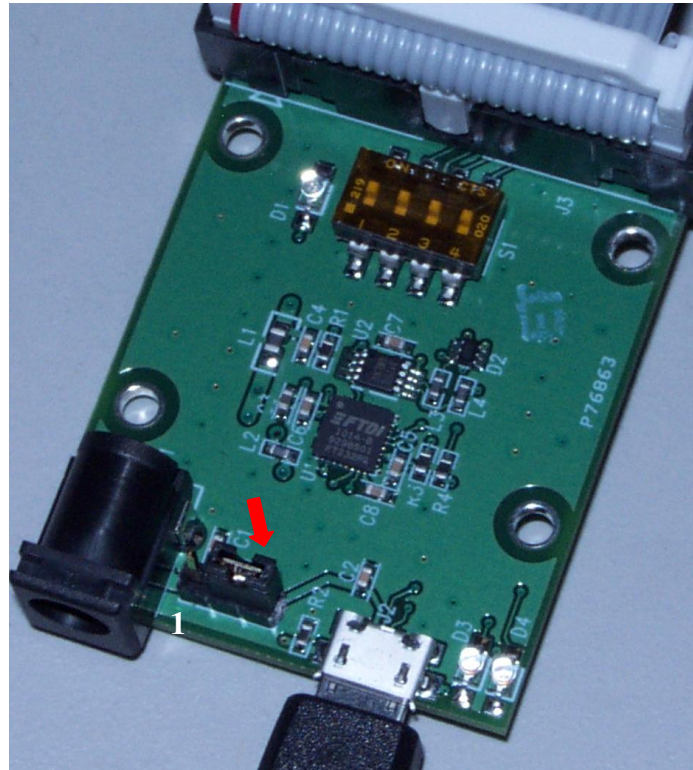

Power Option 1

2. **Option 2:** If the jumper is connected across pins 1 and 2 of JP1, power is supplied to up to five MPQ units, via the MPQ-AIC cable, using a standard MPQ-PS power supply plugged into the MPQ-AIB-USB. In this case, MPQ programmers will not need individual power supplies.
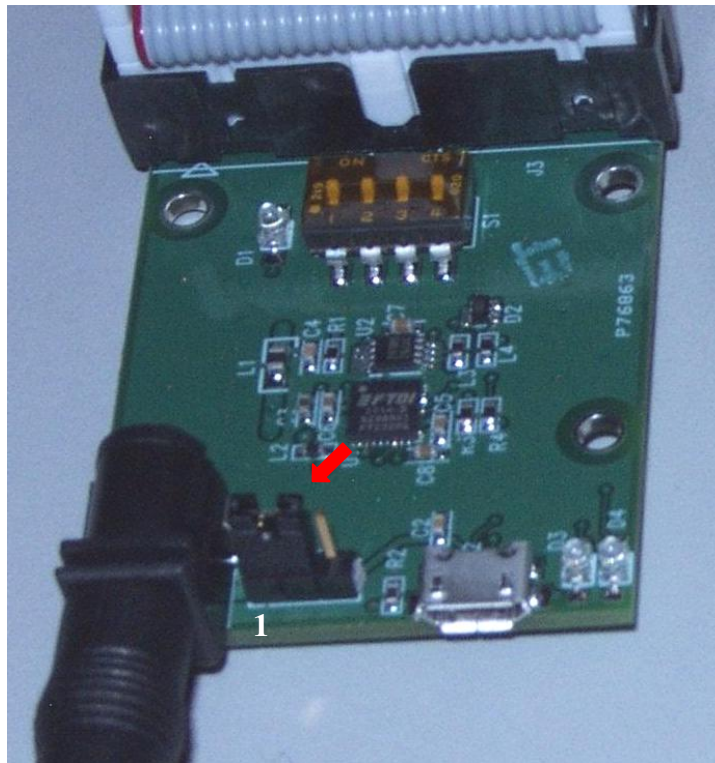
Power Option 2

3. **Option 3:** If the jumper is connected across pins 2 and 3 of JP1, power is supplied to two MPQ units from the USB power supply. This option should only be used if a high-power USB port, capable of supplying 500mA, is available. Up to two MPQ programmers can be powered via the MPQ-AIC cable in this configuration. If more than two programmers are in the array, using Power Option 1 or 2 is recommended. Note that this option requires that the array be connected to an active USB port in order for the MPQ programmers to be powered, so this option is not suitable for standalone operation of the array.

Power Option 3

3   Building an Array

3.1   Array Addressing

In order to communicate with multiple programmers in the array, each programmer must have a different address. If the MPQs are ordered from RPM as part of an array, they will be programmed at the factory such that there are no address conflicts within the array. Programmers with are sold individually, however, will typically be set to address "1", and will need to be reprogrammed in order to avoid address conflicts within the array. This is done using the MPManager software, by connecting the programmers one at a time to the host PC, and setting their addresses using the *Configure/Set Programmer Address* menu function. It is not necessary that the programmers have sequential addresses, only that no two programmers in the array have the same address. However, for the sake of convenience, it is recommended that the programmers be addressed sequentially.
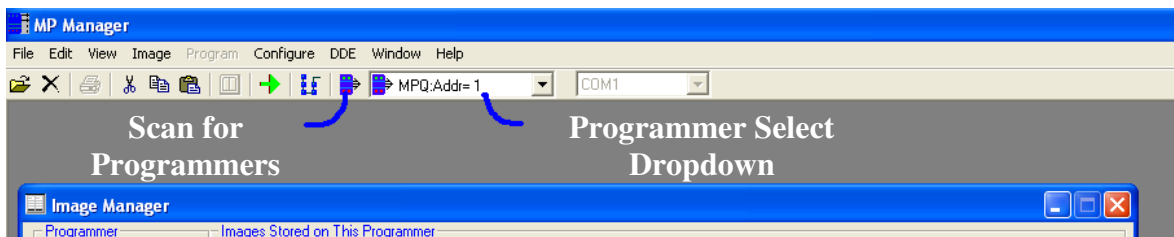
3.2   Array Connection

The photograph below shows an example of two MPQ programmers connected via an MPQ-AIB-USB with the USB port supplying power.
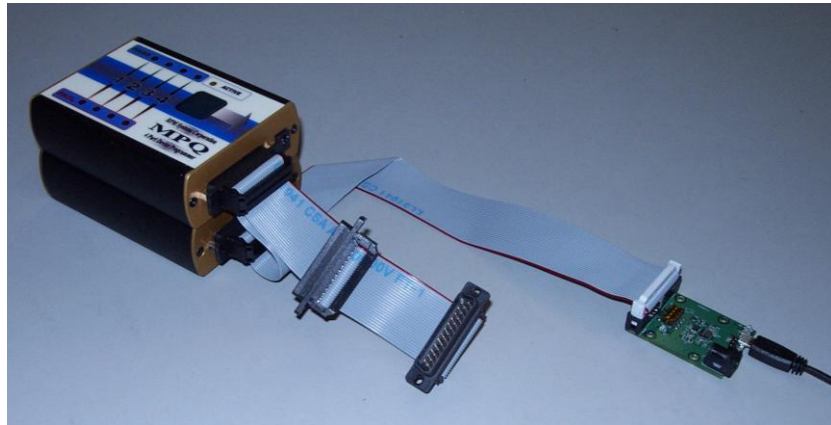
Connect the programmers to the interface board as follows:

1. Connect the Array Interface Cable between the MPQs and the 26-pin header on the USB Array Interface Board. Be careful to observe the pin 1 orientation between the ribbon cable and the 26-pin header.
2. If power is being supplied by the Array Interface Board to the MPQ programmers skip to step 3 (Power Options 2 or 3). Otherwise, if the power jumper is removed/not connected, connect a power supply to each individual MPQ.
3. Connect the USB cable from the USB Array Interface Board to the host PC. (Note: even if you are intending to run a stand-alone array, you may need to connect the array to a PC for image loading and configuration.
4. If the USB Array Interface Board is not being powered via High Power USB (Power Option 3), then connect the standard MPQ power supply to a 100-250VAC,50/60Hz electrical outlet.

Once the programmers are connected and powered, run MP Manager, select the appropriate COM port, and scan for programmers (blue button). Verify that all of the programmers appear in the programmer selection dropdown box.

3.3 Accessing the Array from a PC

Once the array is connected to the PC, the individual programmers may be accessed by selecting them from the programmer selection dropdown box. Use MP Manager to select each programmer, then load images into it and select configuration parameters as necessary, using the Image Manager. You may also perform PC-controlled programming from MP Manager, either on individual programmers, using the Program Manager, or on all programmers simultaneously using the Array Program Manager. Please refer to the MPQ User's Guide for information on image management and programming. NOTE: when using the array in PC-controlled mode, all switches on the array board should be set OFF.

3.3.1 Stand-alone Arrays

The MPQ-AIB-USB facilitates stand-alone arrays by providing switches to provide image selection control. Image selection control allows the switches on the MPQ-AIB-USB to be used to determine which image each programmer will be programmed onto the target devices when programming is initiated by pressing the green button.

3.3.1.1 Switch Settings

Stand-alone programming options are controlled by the switch array on the MPQ-AIB-USB. Note that, for PC-controlled programming.

The switch array is used to select which of the images in each programmer is to be programmed onto its target devices when programming is initiated by pressing the green button. Each programmer can contain up to four different target images. Normally, when stand-alone programming is initiated, the image programmed onto the target will be the default image selected by MP Manager (MPQ User's Guide, section 3.1). However, this option can be overridden by setting position 1 of the switch array ON. In this case, the image to be programmed will be selected using positions 2 and 3, as shown in the table below. Note that the same image selection will be applied to all programmers connected to the MPQ-AIB-USB.

Position 1	Position 2	Position 3	Image Selection
Off	-	-	Default
On	Off	Off	1
On	Off	On	2
On	On	Off	3
On	On	On	4

Image Selection Table