DUGGAN BERGERON INDUSTRIES, LLC

1338 Hooksett Rd. #141
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DBI MP3 Player Development Kit

The DBI MP3 Development Kit is designed as a complete development solution for professionals, hobbyists and students.

The development kit includes the following:

- MP3 Development Board
- USB interface cable
- USB VCP driver
- Windows® based Application loader
- Sample source code
- Functional application binary image
- Microchip C18 compiler 30-day demo

What you will need*:

- A computer running Windows® 98, 2000 or XP
- USB port
- SD Flash card
- Headphones or stereo interface

* These requirements are based on the assumption that the customer will use the development kit for developing an MP3 player using the supplied components on the development board. The development board has many useful features and components that make it extremely versatile and useful for many applications.

The Board

The MP3 Player development board was designed as a means to help developers (including students) become familiar with Microchip's PIC18 family of microcontrollers, and the tools required in this development process. Stating that this development board is used solely for developing an MP3 player would be an injustice, however. The components selected for this board offer the developer several feature options including a USB port, a SD/MMC card interface, keypad, and an MP3 decoder. The board is based on the PIC18LF252, a low-power microcontroller from Microchip. The development kit comes with all the software necessary to develop the player. The microcontroller comes preloaded with a boot, providing a direct interface with the DBI Application loader. Only a few clicks are required to compile the source code and download it into the device.

VCP Driver

To supply the developer with a simple means to communicate with the board, a Virtual Communications Port (VCP) Driver is supplied with the development kit. This driver allows your PC to talk to the board as though it were just another serial communications port on the computer. The original driver was developed by FTDI, and is specifically designed to work with their USB chips. The development board uses a FTDI FT232BM, a high-speed USB chip that interfaces directly to the microcontroller's UART. The VCP driver allows speeds up to 960k baud, and has many configurable parameters. See the 'VCP Driver Readme.pdf' for more details.

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DBI Application Loader

There is a boot preloaded on the microcontroller, which contains a 'failsafe' way for developers to upload new applications to the board. This section cannot be overwritten by itself, and cannot be modified without the use of a hardware programmer like a Microchip® In-Circuit Debugger. The kit is delivered with a sample application image that has a sound clip that demonstrates the functionality of the hardware. This image can be uploaded to the unit at any time to validate the functionality of the board.

How to Upgrade

1. Turn off the power to the MP3 Board
2. Select the appropriate comm port on the Application Loader
3. Press and hold the 'Prev Track' and 'Next Track' buttons
4. Apply power to the MP3 Board
5. A message stating 'Waiting for File' should appear on the comm screen of the Application Loader
6. Click the 'Upgrade' menu
7. Select the desired binary file
8. Click 'Upgrade'

Sample Code and Test Application

Sample application source code is supplied to demonstrate some of the basic features of the board. It makes a good starting point to develop code. Included are examples on how to:

- Use Microchip library functions to talk to the UART
- Toggle the heartbeat LED
- Setup and use a timer interrupt with automatic reload

The test application binary file (ZMP3.bin) offers the developer a way to test the functionality of the MP3 Player Board, and preview the features it has to offer. Follow the instructions listed above ('How to Upgrade') to upload the aforementioned application into the board, then use these instructions to test the board:

1. Power the MP3 player down
2. Insert headphones into the headphone jack on the player
3. Insert a FAT16 formatted SD card with one or more MP3 files into the player
4. After powering the player, the first available song on the SD card will play for 20 seconds
5. Adjust the volume using the 'Volume Up' and 'Volume Down' buttons
6. Pressing either the ' Prev Track' or 'Next Track' button will start the song from the beginning
7. Press and hold the 'Play – Pause' to power down the player

- The heartbeat LED (D5) should be toggling during operation

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Optional Features

Additional software is available as follows:

- FAT16 File System for the SD/MMC Card (binary, read only)
- FAT16 File System for the SD/MMC Card (binary, read and write)
- Source code demonstrating the playing of a small MP3 clip
- Source code demonstrating the playing of MP3 songs stored on the SD/MMC FLASH card (Note: this option includes the FAT16 FILE System binary read only).

Microchip C18 Compiler 30-Day Demo

This compiler is designed for the PIC18 series of microcontrollers from Microchip. The demo will expire after 30 days, at which time the customer may desire purchasing the compiler directly from Microchip. Although this is the compiler used to develop the sample code, there are other compilers available for the PIC18 micros. DBI does not provide support related to any other compiler used during code development.

Intellectual Property

The DBI MP3 Player is not a reference design. Schematics and BOM are included only as an aid to the developer. The MP3 Player is only for personal use and cannot be commercialized without purchasing a licensed agreement from DBI. The information provided in this package cannot be duplicated or distributed.