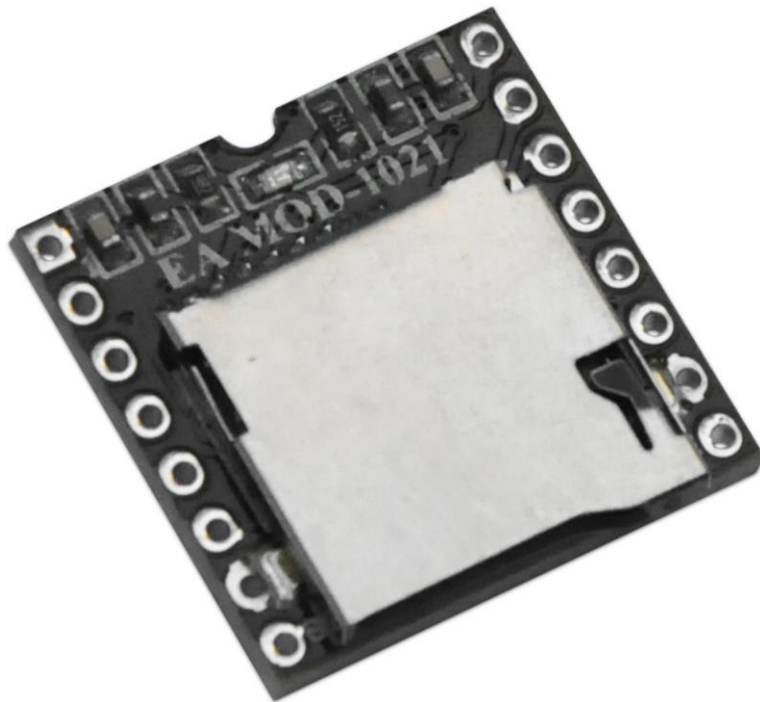Device: MOD-1021

This document Version: 1.0

Matches module version: v1

Date: 24 February 2014

Description: MP3 Audio Module

Contents

Introduction

The MOD-1021 is an MP3 audio playback module.

Features

The MOD-1021 can be controlled through a simple serial connection from a microcontroller, or alternatively by simply pulling one of the playback control inputs to ground.

The MOD-1021 plays back MP3 files and it can handle micro-SD cards up to 32Gb in size and supports FAT16 and FAT32 file systems.

The module can drive a speaker directly and can also connect to a stereo amplifier.

It has 30 volume levels and 10 different EQ settings.

It's pretty awesome.

Connections

The MOD-1021 has two connection ports on either side of the board.

1	VCC	Positive supply, 3.2V – 5V
2	RX	UART serial input
3	TX	UART serial output
4	AN_R	Audio output right channel
5	AN_L	Audio output left channel
6	SPK1	Speaker output
7	GND	Ground connection
8	SPK2	Speaker output

9	IO1	Short press: previous song Long press: decrease volume
10	GND	Not connected
11	IO2	Short press: next song Long press: increase volume
12	ADKEY1	
13	ADKEY2	
14	USB+	USB port
15	USB-	
16	BUSY	High level: content playing Low level: content finished playing

Communications

Command format

The MOD-1021 takes serial commands in the format:

<START> <VERSION> <LENGTH> <COMMAND> <FEEDBACK> <PARAM_MSB> <PARAM_LSB> <CHECK_MSB> <CHECK_LSB> <END>

START	Byte 0x7E
VERSION	Byte 0xFF
LENGTH	Number of bytes from COMMAND through to CHECK_LSB (typically 0x06)
COMMAND	Command byte
FEEDBACK	0x01 Feedback – send confirmation back to microcontroller 0x00 No feedback
PARAM_MSB	Most significant byte of parameter
PARAM_LSB	Least significant byte of parameter
CHECK_MSB	Most significant byte of checksum
CHECK_LSB	Least significant byte of checksum
END	Byte 0xEF

Calculating Checksum

Set your 16 bit checksum value to 0.

For each byte from the VERSION byte until the PARAM_LSB byte, subtract the byte from the checksum.

Commands

The command bytes are as follows:

Command	Function	Parameters
0x01	Next track	
0x02	Previous track	
0x03	Set track	0-2999
0x04	Volume up	
0x05	Volume down	
0x06	Set Volume	0-30 (default on power-up is 30)
0x07	Set EQ	0 – Normal 1 – Pop 2 – Rock 3 – Jazz 4 – Classical 5 – Bass
0x08	Set playback mode	0 – Repeat 1 – Folder repeat 2 – Single repeat

			3 - Random
0x09	Set playback source		0 – USB 1 – Micro SD card 2 – Aux 3 – Sleep 4 – Flash Wait 200ms after specifying a new playback source
0x0a	Low power standby mode		
0x0b	Normal mode		
0x0c	Reset module		
0x0d	Playback		
0x0e	Pause		
0x0f	Set folder		MSB – folder (1 – 10) LSB – MP3 file (1 – 255)
0x10	Volume adjust		MSB=1:Open volume adjust LSB: set volume gain 0~31
0x11	Repeat play		0 – Stop play 1 – Start repeat play

System queries

Command	Function
0x40	Error, request retransmission
0x41	Reply
0x42	Query current status
0x43	Query current volume
0x44	Query current EQ
0x45	Query current playback mode
0x46	Query current software version
0x47	Query total files on micro SD card
0x48	Query total U-disk files
0x49	Query total flash files
0x4a	Keep on. We're not really sure what this does. If you work it out please let us know!
0x4b	Query current track on micro SD card
0x4c	Query current track on U disk
0x4d	Query current track on flash

Data from module

The module will respond in the following ways:

Command	Function	Parameter
0x3a	Media inserted	2 – micro SD card inserted
0x3b	Media removed	2 – micro SD card removed

0x3c	Udisk track finished playing	Track number
0x3d	Micro SD card track finished playing	Track number
0x3e	Flash track finished playing	Track number
0x40	Error	0 – Module is busy 1 – Data not received 2 – Verification error

Example transactions

Push micro SD card in:

Module responds:

7E FF 06 3A 00 00 02 FE BF EF

Push micro SD card out:

7E FF 06 3B 00 00 02 FE BE EF

Sending Play command:

<7E><FF><06><0D><01><00><00><FE><ED><EF>

Module responds:

7E FF 06 41 00 00 00 FE BA EF

Power

The MOD-1021 handles 3.3V – 5V power, but really needs 3.3V TTL serial communications. If you are running things at 5V, pop a 1k resistor between your microcontroller serial pins and module serial pins.

Versions

Version	Date	Comments
Version 1.0	24 Feb 2014	Initial Version for board v1