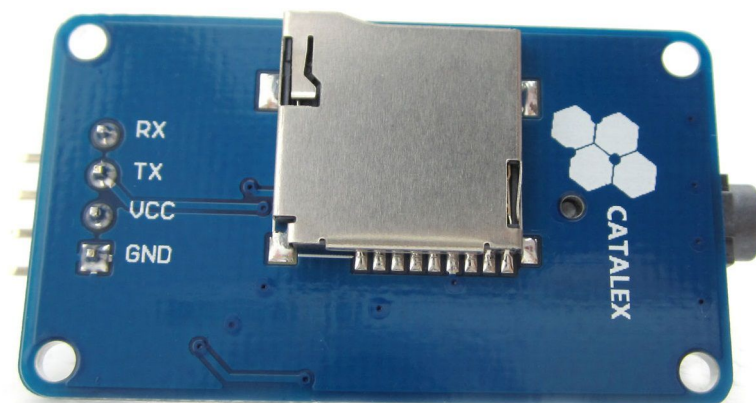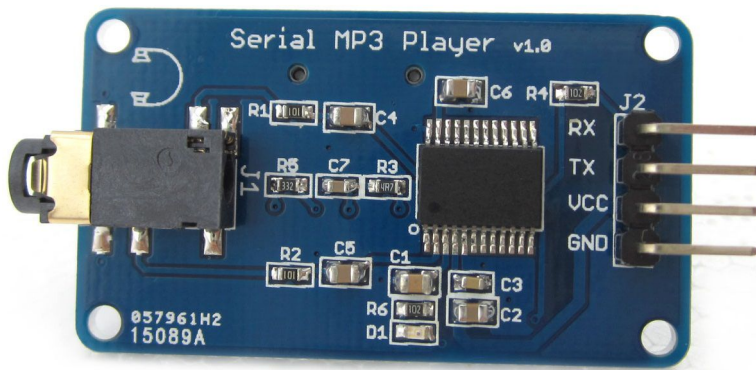CATALEX

Name: Serial MP3 Player manual

Version: v1.0

Date: Aug 22, 2014

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1 Description

The module is a kind of simple MP3 player device which is based on a high-quality MP3 audio chip---YX5300. It can support 8k Hz ~ 48k Hz sampling frequency MP3 and WAV file formats. There is a TF card socket on board, so you can plug the micro SD card that stores audio files. MCU can control the MP3 playback state by sending commands to the module via UART port, such as switch songs, change the volume and play mode and so on. You can also debug the module via USB to UART module. It is compatible with Arduino / AVR / ARM / PIC.

Features：

1. Support sampling frequency (kHz): 8 / 11.025 / 12 / 16 / 22.05 / 24 / 32 / 44.1 / 48
2. High quality
3. Support file format: MP3 / WAV
4. Support Micro SD card, Micro SDHC Card
5. 30 class adjustable volume
6. UART TTL serial control playback mode, baud rate is 9600bps
7. Power supply can be 3.2 ~ 5.2VDC
8. Control logic interface can be 3.3V / 5V TTL
9. Compatible with Arduino UNO / Leonardo / Mega2560 / DUE

2 Specification

Item	Min	Typical	Max	Unit
Power Supply(VCC)	3.2	**5**	5.2	VDC
Current (@VCC=5V)	/	/	200	mA
Logic interface	3.3V / 5V TTL			/
Supported Card Type	Micro SD card(<=2G); Mirco SDHC card(<=32G)			/
File system format	Fat16 / Fat32			/
Uart baud rate	**9600**			bps
Dimensions	49X24X8.5			mm
Net Weight	5			g

3 Interface
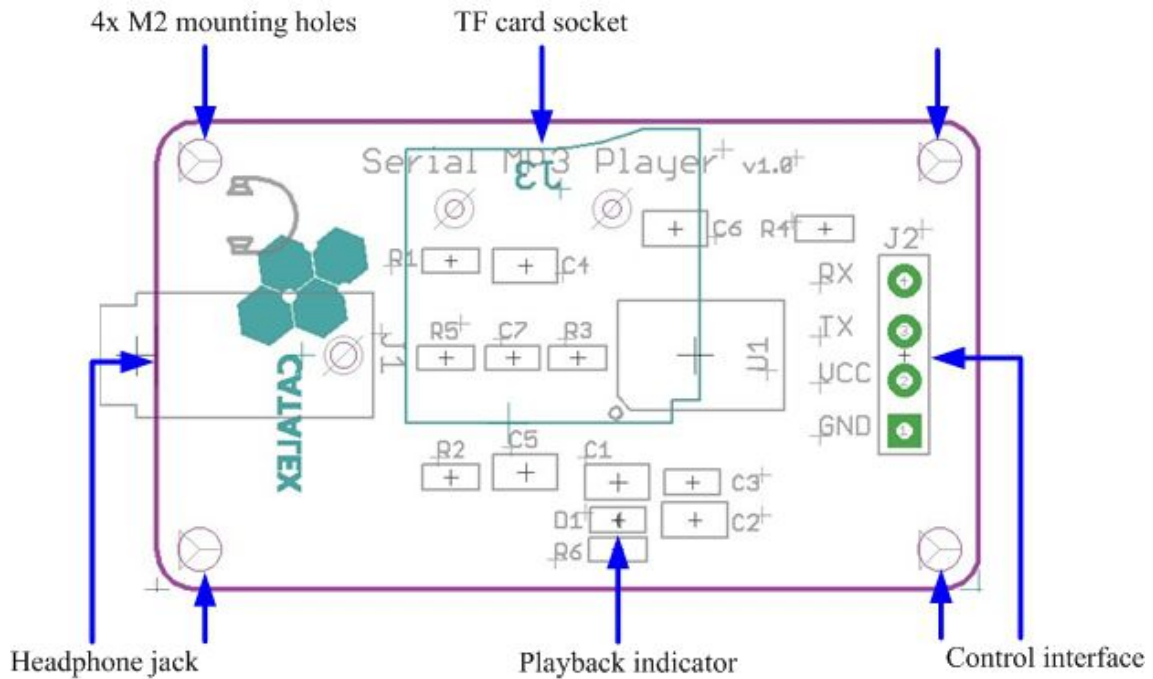
Control interface: It is UART TTL interface. A total of four pins (GND, VCC, TX, RX), GND to ground, VCC is the power supply, TX is the TX pin of the MP3 chip, RX is the RX pin of the MP3 chip.

TF card socket: The micro sd card can be plugged in it.

Playbck indicator: Green light. If it is ready to play or it is paused, it keeps lighting. If playing, it blinks.

Headphone jack: It can be connected with the headphone or external amplifier.

Mounting holes: 4 screw mounting holes whose diameter is 2.2mm, so that the module is easy to install, easy to combine with other modules.

4 Usage

4.1 About the commands

4.1.1 Asynchronous serial port control play mode:

| Command bytes: $S VER Len CMD Feedback data $O		
Mark	**Byte**	**Byte description**
$S	0x7E	Every command should start with $(0x7E)
VER	0xFF	Version information
Len	0xxx	The number of bytes of the command without starting byte and ending byte
CMD	0xxx	Such as PLAY and PAUSE and so on
Feedback	0xxx	0x00 = not feedback, 0x01 = feedback
data		The length of the data is not limit and usually it has two bytes
$O	0xEF	Ending byte of the command

4.1.2 Commonly Command bytes Descriptions:

Command	Command bytes without checksum(HEX)	Remark
[Next Song]	7E FF 06 **01** 00 00 00 EF	
[Previous Song]	7E FF 06 **02** 00 00 00 EF	
[Play with index]	7E FF 06 **03** 00 **00 01** EF	Play the first song
	7E FF 06 **03** 00 **00 02** EF	Play the second song
[Volume up]	7E FF 06 **04** 00 00 00 EF	Volume increased one
[Volume down]	7E FF 06 **05** 00 00 00 EF	Volume decrease one
[Set volume]	7E FF 06 **06** 00 **00 1E** EF	Set the volume to 30 (0x1E is 30)
[Single cycle play]	7E FF 06 **08** 00 **00 01** EF	Single cycle play the first song
[Select device]	7E FF 06 **09** 00 **00 02** EF	Select storage device to TF card
[Sleep mode]	7E FF 06 **0A** 00 00 00 EF	Chip enters sleep mode
[Wake up]	7E FF 06 **0B** 00 00 00 EF	Chip wakes up
[Reset]	7E FF 06 **0C** 00 00 00 EF	Chip reset
[Play]	7E FF 06 **0D** 00 00 00 EF	Resume playback
[Pause]	7E FF 06 **0E** 00 00 00 EF	Playback is paused
[Play with folder and file name]	7E FF 06 **0F** 00 **01 01** EF	Play the song with the directory: /01/001xxx.mp3
	7E FF 06 **0F** 00 **01 02** EF	Play the song with the directory: /01/002xxx.mp3
[Stop play]	7E FF 06 **16** 00 00 00 EF	
[Cycle play with folder name]	7E FF 06 **17** 00 00 **01** EF	01 folder cycle play
[Shuffle Play]	7E FF 06 **18** 00 00 00 EF	
[Set single cycle play]	7E FF 06 **19** 00 00 **00** EF	Start up single cycle play

|	7E FF 06 **19** 00 00 **01** EF	Close single cycle play
[Set DAC]	7E FF 06 **1A** 00 00 **00** EF	Start up DAC output
	7E FF 06 **1A** 00 00 **01** EF	DAC no output
[Group play with indexes]	7E FF 09 **21** 00 **05 01 02 03 04** EF	Play 5 songs in the order of the song index: 05, 01, 02, 03,04
	7E FF 0C **21** 00 05 01 02 03 04 06 07 08 EF	Play 8 songs in the order of the song index: 05, 01, 02, 03,04, 06, 07, 08
[Play with volume]	7E FF 06 **22** 00 **1E 01** EF	Set the volume to 30 (0x1E is 30) and play the first song
	7E FF 06 **22** 00 0**F 02** EF	Set the volume to 15(0x0f is 15) and play the second song

4.2 Use USB to Uart TTL module

(1) You need a **USB to Uart TTL module** (such as USB/Serial Adapter) to connect **Serial MP3 Player** to PC. The hardware installation as show below:
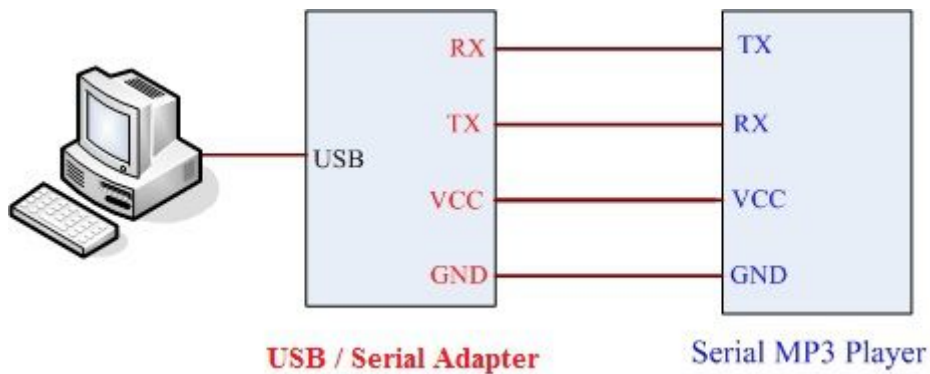

(2) After the connection is completed, open the sscom32 serial tool that you can down load from catalex net disk to send commands. About the specific commands, please refer to 4.1.1 part.

(3) Click the EXT button and then you can manage the commands to be sent.
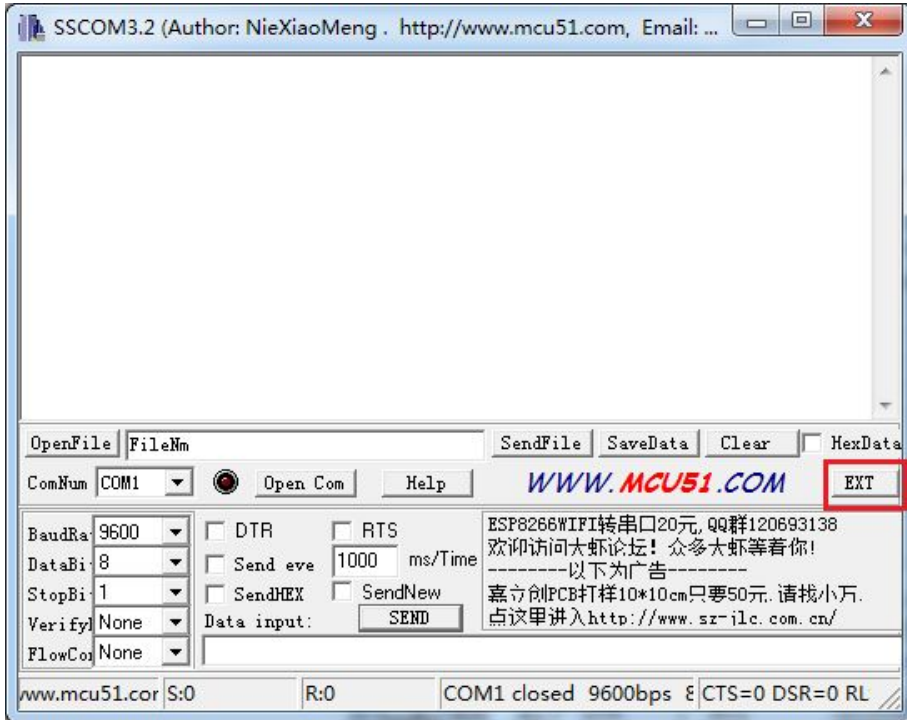
(3) Baud rate should be 9600. Tick HEX and HexData so that the command can be

received by the Serial MP3 Player and you can see the feedback information (refer to

the file **YX5300-24SS Datasheet V1.0.pdf**) in the blank of the window. Before

sending commands, you should select the [ComNum] and click [Open Com].
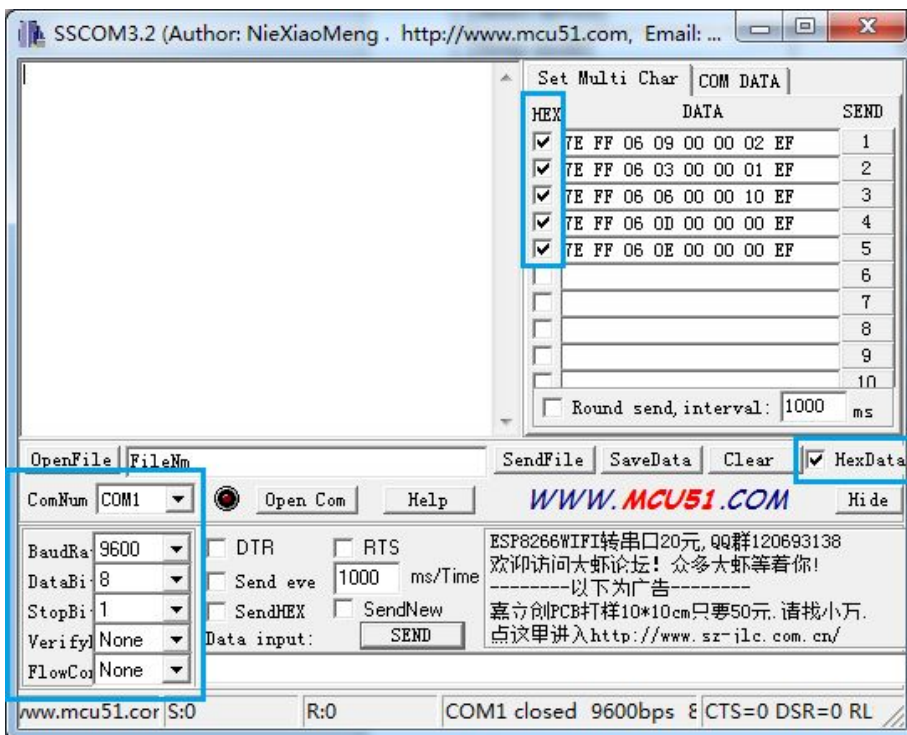
(4) Make sure your micro sd card is formatted as FAT16 or FAT32 and there is some songs in it. May be you should creat folder "01" and "02", and put some songs with the name 001xxx.mp3 / 002xxx.mp3 / 003xxx.mp3 in the two folder. Some commands need them.

(5) After power up, you should send the command [**Select device**] first. Serial MP3 Player only supports micro sd card, so you should send "7E FF 06 09 00 00 02 EF".

Then you can send the command [**Play with index**] to play some song.

You can send the command [**Set volume**] to set the volume(0 ~ 30 class).

More operations ? Please refer to 4.1.1 part.

4.3 Use Arduino UNO R3

4.3.1 Project1: Simple test for the player.

Step1: Material preparation
　1x Arduino UNO R3
　1x USB Cable
　1x Serial MP3 Player
　1x Base Shield
　4x Female to Female Dupont cables
Step2: Hardware install
　(1)Plug the Base Shield which is just the I/O expansion board to Arduino UNO R3.
　(2)Connect the modules and Base Shield with the cables:

Serial MP3 Player	Wire	Base Shield
GND	<--->	GND
VCC	<--->	5V
TX	<--->	D5
RX	<--->	D6

　(3)Make sure your micro sd card is formatted as FAT16 or FAT32 and there is some songs in it. May be you should creat folder "01" and "02", and put some songs with the name 001xxx.mp3 / 002xxx.mp3 / 003xxx.mp3 in the two folder. Some commands need them.
Plug the micro sd card into the TF card socket on the Serial MP3 Player, and then plug the headphone.

Step3: Power on

Use the USB cable to connect the Arduino UNO R3 and PC.

Step4: Upload the demo code

Download the demo code (SerialMP3PlayerDemoforArduino-1.0.zip), and unzip it to your code project folder such as ../Arduino-1.0/MyProject. And then upload the code to your arduino UNO R3.

Step5: Enjoy yourself

Push the reset button on the Base Shield to play the first song in the micro sd card.

Step6: Power off

Unplug USB cable.

4.3.2 Project2: Use some modules to control the player. Enjoy!

Step1: Material preparation

1x Arduino UNO R3
1x USB Cable
1x Serial MP3 Player
1x Base Shield
1x Touch Sensor
1x Rotary Angle Sensor
10x Female to Female Dupont cables

Step2: Hardware install

(1)Plug the Base Shield which is just the I/O expansion board to Arduino UNO R3.

(2)Connect the modules and Base Shield with the cables:

	Wire	**Base Shield**
GND	<--->	GND
VCC	<--->	5V
TX	<--->	D5
RX	<--->	D6

Touch Sensor	Wire	**Base Shield**
GND	<--->	GND
VCC	<--->	5V
SIG	<--->	D2

Rotary Angle Sensor	Wire	**Base Shield**
GND	<--->	GND
VCC	<--->	5V
SIG	<--->	A0

(3)Make sure your micro sd card is formatted as FAT16 or FAT32 and there is some songs in it. May be you should creat folder "01" and "02", and put some songs with the name 001xxx.mp3 / 002xxx.mp3 / 003xxx.mp3 in the two folder. Some commands need them.

Plug the micro sd card into the TF card socket on the Serial MP3 Player, and then plug the headphone.

Step3: Power on

Use the USB cable to connect the Arduino UNO R3 and PC.

Step4: Upload the demo code. If you have download in Project1, skip this step.

Download the demo code (SerialMP3PlayerDemoforArduino-1.0.zip), and unzip it to your code project folder such as ../Arduino-1.0/MyProject. And then upload the code to your arduino UNO R3.

Step5: Enjoy yourself

Push the reset button on the Base Shield. In the process that the Rotation Angle Sensor is rotated from the 'Min' side to the 'Max' side, the volume is gradually greater. If you touch the Touch Sensor,it will play or pause.

About more specific commands, please refer to **4.1.1** part.

Step6: Power off

Unplug USB cable.

5 Part List

1x Serial MP3 Player Module

Documents download link: http://pan.baidu.com/s/1hqilpB2