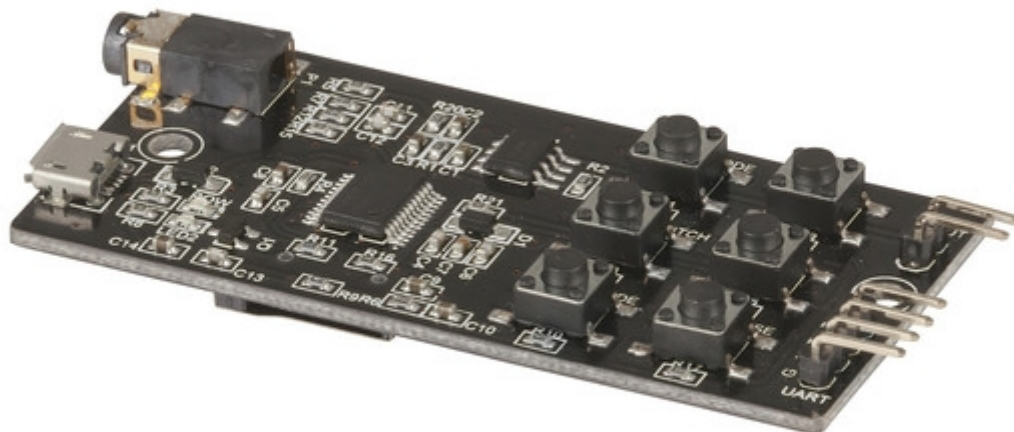


AUDIO REPORT PLAYBACK SYSTEM DEVELOPMENT NOTES

The Mk1 prototype used the Duinotech module (<https://www.jaycar.com.au/arduino-compatible-mp3-audio-player-with-button-controls/p/XC3748>) which had a problem with playback speed ... too slow for some reason on first requested playback; subsequent playbacks were at normal speed ?! It also could only be programmed using hexadecimal strings.



The following research notes show that there are simpler modules that can be driven via simple changes in the levels transmitted from the ESP32's GPIO pins :

<https://www.smart-prototyping.com/MP3-Player-Module>

\$8.90



Description:

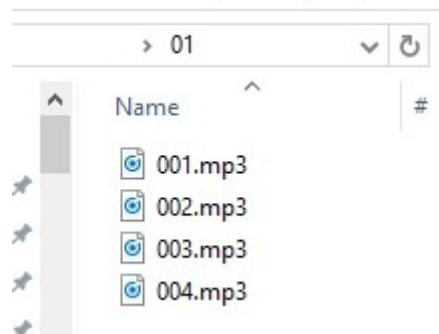
This nifty little MP3 player can take your projects up a notch by using sound or music as a form of output.

Don't be scared by these pins! This is a very easy-to-use MP3 module. Even if you don't have any coding skills, you can use it to play audio in seconds. It's very suitable for makers to incorporate sounds or music into their project.

You will need an external device hooked up to the 3.5mm audio jack to hear the programmed sounds such as a speaker or headphones.

Before you start using it, here are some simple rules you need to follow, otherwise you might spend a long time debugging to no avail.

- It supports FAT/FAT 32 file system, SD card memory max. 16Gb.
- Audio sample rate supported: 8, 11.025, 12, 16, 22.05, 24, 32, 44.1, 48 KHZ
Note: Higher sample rates may also work, but are not 100% supported.
- 3. Audio files must be stored in the following structure:
/01/001filename.mp3, /01/002filename.mp3

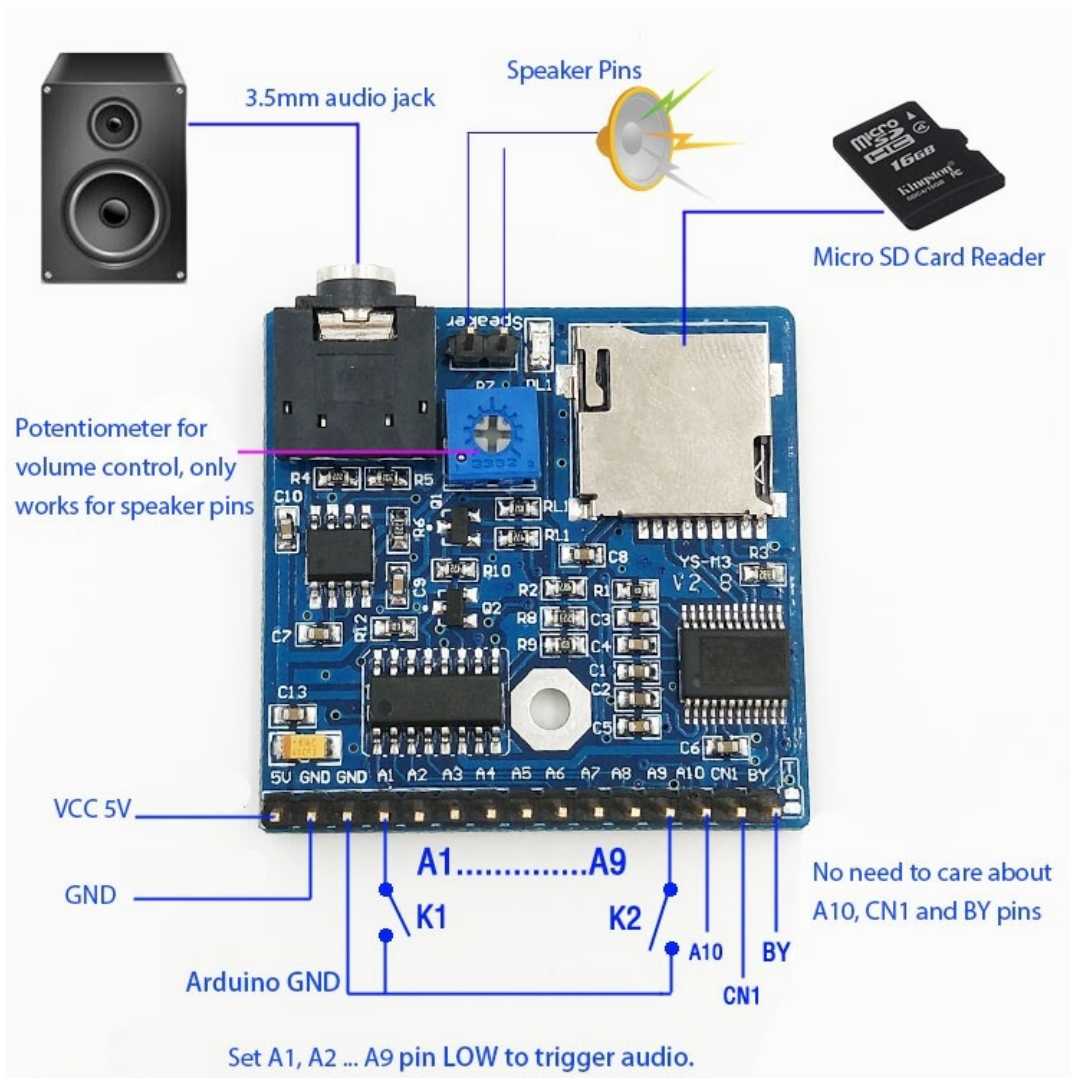


How to use it:

Connection to Arduino

MP3 Module	Arduino UNO
5V	5V
GND	GND
GND	GND
A1- A9	D0 - D8 (any digital port is OK)

By keeping LOW one of the module's A0-A9 pins and the rest of the pins HIGH, the MP3 module will automatically play the LOW pin's track. The A1 pin assigned to 001.mp2. A2 to 002.mp3... Just as simple as that! In this way, you can implement up to 9 tracks!



SIMILAR UNITS AVAILABLE IN LOT OF 5 FROM QZX

<https://www.aliexpress.com/item/1005006165615344.html> AU\$25

1. Support MP3 and WAV decoding formats.
2. Support sampling rate (KHz): 8/11.025/12/16/22.05/24/32/44.1/48.
3. 24-bit DAC output, dynamic range support 90dB, signal-to-noise ratio support 85dB.
4. Fully support FAT16/FAT32 file system, maximum support for 32G TF card.
5. Comes with 5W class D power amplifier, can directly drive 4Ω, 3~5W speakers.
6. UART serial port control voice broadcast function, can control playback, pause, song selection, volume addition and subtraction, etc., the largest selection of 65,535 songs, baud rate of 9600bit / s.
7. Support IO trigger playback function, 8 IO ports trigger 8 tracks or 8 IO ports to trigger 255 tracks.
8. Support One_line single bus serial port control, can control playback, pause, song selection, volume addition and subtraction and other functions.
9. Support 3 configuration IO for up to 7 working mode selection, dial switch settings are simple.
10. Module interface and function definition

Specification:

Model: DY-SV5W

Dimensions: 4x4cm/1.57x1.57inch

Color: As shown

Quantity: 1 Pc

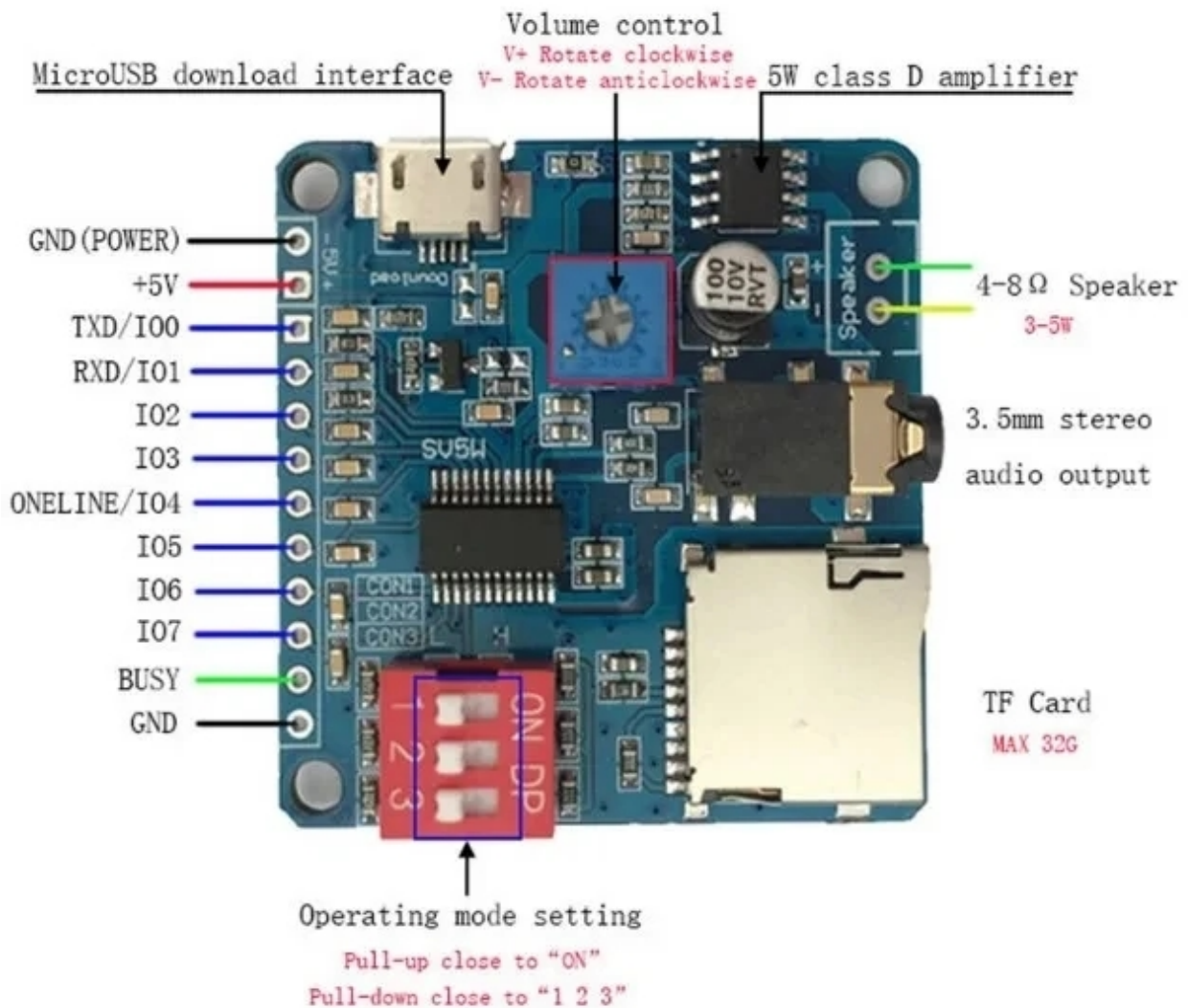
Note: 1.Please allow 0-1cm error due to manual measurement. pls make sure you do not mind

before you bid.

2. Due to the difference between different monitors, the picture may not reflect the actual color of the item. Thank you!

Package includes:

1 x MP3 Player Module



THIS SITE HAS THE PROGRAMMING INSTRUCTIONS !!!

<https://www.aliexpress.com/item/1005005992419292.html>

Installation Manual:

<http://attach01.oss-us-west-1.aliyuncs.com/IC/Datasheet/13442.rar>

1. Description:

DY-SV5W is an intelligent voice module developed by the division independently. It integrates I/O subsection triggering, UART serial port control, ONE_line single bus serial port control. Onboard 5W Class D amplifier circuit and can directly drive 4ohm 3~5W speakers. Support MP3, WAV decoding format. Max support 32Gbit(4MByte) TF card memory, can connect the computer to

update TF card to store audio files via USB cable.3.5mm audio interface, U disk interface, Micro USB download interface, button module in one module

2.Features:

1>.Support MP3 and WAV decoding format.

2>.Support sampling frequency (KHz) : 8/11.025/12/16/22.05/24/32/44.1/48.

3>.24-bit DAC output, dynamic range support 90dB, SNR support 85dB.

4>.Support the FAT16/FAT32 file system, with the maximum support 32Gbit(4MByte) TF card and 32Gbit(4MByte) U-disk.

5>.Support UART serial port control voice broadcast function.It can control playback, pause, selections, turn up and down volume and other functions, the largest selection of 65535 songs.The baud rate is 9600 bit/s.

6>.Support I/O trigger function, 8bit I/O ports can trigger 8 musics or 8 I/O combinations to trigger 255 songs.

7>.Support One_line single bus serial port control, which can control playback, pause, selection, turn up and down volume and other functions.

8>.Support 3 configuration I/O for mode selection to make 7 work mode.

9>.Built in 5W Class D amplifier circuit and can directly drive 4ohm 3~5W speaker.

3.Parameters:

1>.Product Name:DY-SV5W Voice Playback Module

2>.Product Number:DY-SV5W

3>.Work Voltage:DC 5V

4>.Working Temperature range:-20~85 Celsuis

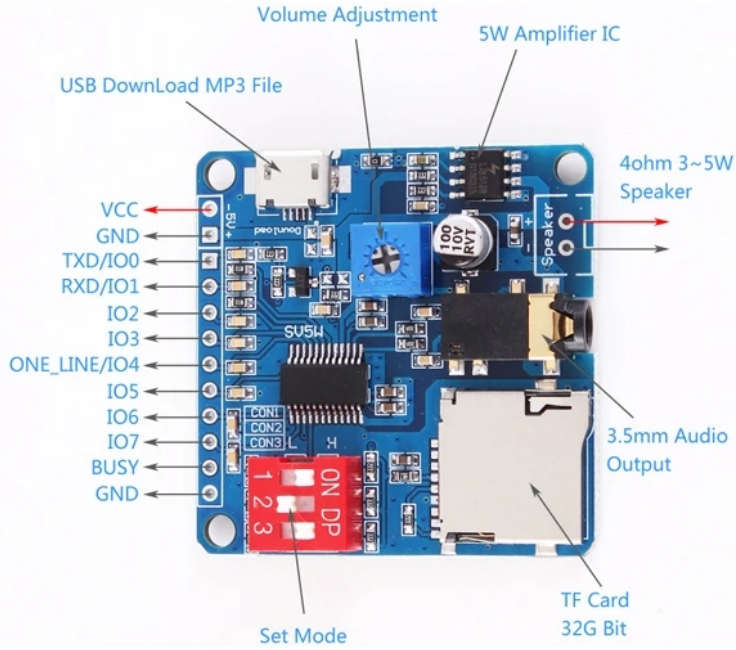
5>.Working Humidity range:0%-95%RH

6>.Size :40*40*9mm

4.Package:

1>.1pc DY-SV5W Voice Playback Module

Pin Definition



No.	Pin Name	Instruction
1	5V+	Work Voltage Positive Pole
2	5V-	Work Voltage Negative Pole
3	TXD/IO0	IO trigger mode is input IO0;UART mode is TX.
4	RXD/IO1	IO trigger mode is input IO1;UART mode is RX.
5	IO2	IO trigger mode input IO2.
6	IO3	IO trigger mode input IO3.
7	IO4/ONE_LINE	IO mode input IO4;One_Line mode data receiver pin.
8	IO5	IO trigger mode input IO5.
9	IO6	IO trigger mode input IO6.
10	IO7	IO trigger mode input IO7.
11	BUSY	Output low level signal(0V) when playing and output high(3.3V) after playing.
12	GND	Ground

Work Mode Configuration											
Control Mode	Configuration Pin			I/O Function							
	CON3	CON2	CON1	IO7	IO6	IO5	IO4	IO3	IO2	IO1	IO0
I/O Integrated Mode 0	0	0	0	Key combination play, can play 2 ⁸ -1(255) Songs.							
I/O Integrated Mode 1	0	0	1	Level combination play, can play 2 ⁸ -1(255) Songs.							
I/O Independent Mode 0	0	1	0	Song8	Song7	Song6	Song5	Song4	Song3	Song2	Song1
I/O Independent Mode 1	0	1	1	Song8	Song7	Song6	Song5	Song4	Song3	Song2	Song1
UART Mode	1	0	0							RXD	TXD
One-Line Mode	1	0	0				TXD				
Standard MP3 Mode	1	0	1				RPT	EQ	P/P/MODE	PREV/V-	NEXT/V+

Note:

1>. "key combination play" : Return to the original high level after the corresponding level from I/O0-I/O7 output, similar to the key triggered once.Similar instantaneous switch.

2>. "Level combination play" :The trigger signal remains the same, similar to a self-locking switch.

3>.The difference between "I/O Integrated/Independent Mode 0" and "I/O Integrated/Independent Mode 1" :Mode 0 will continue playing the current song to the end after release level .Mode 1 will stop playing immediately after release level.

I/O Integrated Mode 0 (Key combination playing).

Note: the song must be named for 5bit.

IO7	IO6	IO5	IO4	IO3	IO2	IO1	IO0	Song	It will stop playing current song to the end after I/O0-7 release input signal (return to high) at 'I/O Integrated Mode 0'. It will playing new song when get new input signal during playing and stop after end of song. It will play repeatedly if keep input. Busy pin will output valid signal(High) during playing.Music control as following:
1	1	1	1	1	1	1	0	00001.mp3	
1	1	1	1	1	1	0	1	00002.mp3	
1	1	1	1	1	1	0	0	00003.mp3	
1	1	1	1	1	0	1	1	00004.mp3	
1	1	1	1	1	0	1	0	00005.mp3	
1	1	1	1	1	0	0	1	00006.mp3	
1	1	1	1	1	0	0	0	00007.mp3	
.....	
0	0	0	0	0	0	0	0	00255.mp3	

I/O Integrated Mode 1 (Level combination playing)								
IO7	IO6	IO5	IO4	IO3	IO2	IO1	IO0	Song
1	1	1	1	1	1	1	0	00001.mp3
1	1	1	1	1	1	0	1	00002.mp3
1	1	1	1	1	1	0	0	00003.mp3
1	1	1	1	1	0	1	1	00004.mp3
1	1	1	1	1	0	1	0	00005.mp3
1	1	1	1	1	0	0	1	00006.mp3
1	1	1	1	1	0	0	0	00007.mp3
.....
0	0	0	0	0	0	0	0	00255.mp3
I/O Independent Mode 0 (Key independent controlling)								
IO7	IO6	IO5	IO4	IO3	IO2	IO1	IO0	Song
1	1	1	1	1	1	1	0	00001.mp3
1	1	1	1	1	1	0	1	00002.mp3
1	1	1	1	1	0	1	1	00003.mp3
1	1	1	1	0	1	1	1	00004.mp3
1	1	1	0	1	1	1	1	00005.mp3
1	1	0	1	1	1	1	1	00006.mp3
1	0	1	1	1	1	1	1	00007.mp3
0	1	1	1	1	1	1	1	00008.mp3
I/O Independent Mode 1 (Level independent controlling)								
IO7	IO6	IO5	IO4	IO3	IO2	IO1	IO0	Song
1	1	1	1	1	1	1	0	00001.mp3
1	1	1	1	1	1	0	1	00002.mp3
1	1	1	1	1	0	1	1	00003.mp3
1	1	1	1	0	1	1	1	00004.mp3
1	1	1	0	1	1	1	1	00005.mp3
1	1	0	1	1	1	1	1	00006.mp3
1	0	1	1	1	1	1	1	00007.mp3
0	1	1	1	1	1	1	1	00008.mp3

It will keep playing current song when get trigger signal.It will stop playing immediately after release level.Busy pin will output valid signal(High) during playing.

I/O0-I/O7 independently controls 8 songs.It will stop playing current song to the end after I/O0-7 release input signal(return to high);It will playing new song when get new input signal during playing and stop after end of song;It will play repeatedly if keep input;Busy pin will output valid signal(High) during playing.

I/O0-I/O7 independently controls 8 songs.It will keep play repeatedly specify the triggered song.It will stop playing immediately after release level.Busy pin will output valid signal(High) during playing.

UART Mode					
Communication Format					
Adopt full duplex serial port communication. Baud rate 9600, data bits 8, stop bit 1, check bit N.					
Start Code	Command Type	Data Length (n)	Data 1	Data n	Check Bit (SM)
Command Code: fixed to 0xAA.					
Command Type: used to distinguish the type of command.					
Data Length: the number of bytes of data in an command.					
Data: Relevant data in command, when length of data is 1, means there is only CMD and no data bits.					
Check Bit: Low 8 bits of sum of all bytes. that is, When start code and data are added, take out low 8 bits.					
Data format: Sent data or command, high 8-bit data is in front, low 8-bit is in the back.					
Communication Protocol					
The following is a data definition for the return and identification of the chip.					
A. Playing State definition: the system is on the stop state when power on.					
	00(stop)	01(play)	02(pause)		
B. Disk character definition: it is stopped after the switch disk.					
	USB:00	SD:01	FLASH:02	NO_DEVICE: FF	
C. Volume: the volume is 31grades, 0-30.The default is 20grade.					
D. Play mode: the default is the single stop when power on.					
Cycle for all songs (00) : play the whole songs in sequence and play it after the play.					
Single cycle (01) : play the current song all the time.					
Single stop (02) : Only play current song once and then stop.					
Random play (03) : random play.					
Directory loop (04) :Play in current folder in order, then play by play.Directory don't contain subdirectory.					
Directory random (05): random play in the current folder, and directory does not contain subdirectory.					
Directory order play(06):Play current folder in order & stop after play.Directory not include subdirectory.					
Sequential play (07) : play the whole songs in order and stop after it is played.					
E. EQ definition: the default EQ is NORMAL(00).					
	NORMAL(00)	POP(01)	ROCK(02)	JAZZ(03)	CLASSIC(04)
F. Composition play definition: combination play is combined by filename. The file requirements are stored under the "XY" file. You can change the name of the file you want to combine to two bytes, which is generally recommended as a number. Such as: 01. Mp3, 02. Mp3.					

UART Communication Command		
Control Command		
Command	Command code	Return
Play	AA 02 00 AC	None
Pause	AA 03 00 AD	None
Stop	AA 04 00 AE	None
Previous	AA 05 00 AF	None
Next	AA 06 00 B0	None
Volume +	AA 14 00 BE	None
Volume -	AA 15 00 BF	None
Previous file	AA 0E 00 B8	None
Next file	AA 0F 00 B9	None
Stop playing	AA 10 00 BA	None
Query Command		
Command	Command Code	Return
Query play status	AA 01 00 AB	AA 01 01, play status, SM
Query current online drive	AA 09 00 B3	AA 09 01, drive, SM
Query current play drive	AA 0A 00 B4	AA 0A 01, drive, SM
Query Number of songs	AA 0C 00 B6	AA 0C 02S.N.H S.N.L SM
Query current song	AA 0D 00 B7	AA 0D 02 S.N.H S.N.L SM
Query folder directory song	AA 11 00 BB	AA 11 02 S.N.H S.N.L SM
Query folder Number of songs	AA 12 00 BC	AA 12 02 S.N.H S.N.L SM

UART Communication Command					
Control Command			Query Command		
Command	Command Code	Return	Command	Command code	Return
Play	AA 02 00 AC	None	Query play status	AA 01 00 AB	AA 01 01, play status, SM
Pause	AA 03 00 AD	None	Query current online drive	AA 09 00 B3	AA 09 01, drive, SM
Stop	AA 04 00 AE	None	Query current play drive	AA 0A 00 B4	AA 0A 01, drive, SM
Previous	AA 05 00 AF	None	Query Number of songs	AA 0C 00 B6	AA 0C 02S.N.H S.N.L SM
Next	AA 06 00 B0	None	Query current song	AA 0D 00 B7	AA 0D 02 S.N.H S.N.L SM
Volume +	AA 14 00 BE	None	Query folder directory song	AA 11 00 BB	AA 11 02 S.N.H S.N.L SM
Volume -	AA 15 00 BF	None	Query folder Number of songs	AA 12 00 BC	AA 12 02 S.N.H S.N.L SM
Previous file	AA 0E 00 B8	None			
Next file	AA 0F 00 B9	None			
Stop playing	AA 10 00 BA	None			
Setting Command					
Command		Command code	Return	Remark	
Set Volume		AA 13 01 VOL SM	None	VOL:0x00-0xFF	
Set Loop mode		AA 18 01 Loop-mode SM	None	Loop-mode:0x00-0x07	
Set Cycle times		AA 19 02 H L SM	None	H:0x00-0xFF L:0x00-0xFF	
Set EQ		AA 1A 01 EQ SM	None	EQ:0x00-0x04	
Specified Song		AA 07 02 S.N.H S.N.LSM	None	S.N.H:0x00-0xFF S.N.L:0x00-0xFF	
Specified Path		AA 08 Length Drive Path SM	None	Length:0x00-0xFF	
				Drive:0x00-0xFF	
				Path:0x00-0xFF	
Switch Specified Drive		AA 0B 01 Drive SM	None	Drive:0x00-0xFF	
Specified song to be interplay		AA 16 03 Drive S.N.H S.N.L SM	None	Drive:0x00-0xFF	
				S.N.H:0x00-0xFF	
				S.N.L:0x00-0xFF	
Specified path to be interplay		AA 17 Length Drive Path SM	None	Length:0x00-0xFF	
				Drive:0x00-0xFF	
				Path:0x00-0xFF	
Select but no play		AA 1F 02 S.N.H S.N.L SM	None	S.N.H:0x00-0xFF S.N.L:0x00-0xFF	

One_line Single Bus Mode		
Command(HEX)	Function	Note
0x00	No. 0	The number 0-9 has corresponding functions, such as selecting music, setting the volume, setting EQ, setting cycle mode, setting channel, setting the repertoire, and sending the digital at first and then send function command.
0x01	No. 1	
0x02	No. 2	
0x03	No. 3	
0x04	No. 4	
0x05	No. 5	
0x06	No. 6	
0x07	No. 7	
0x08	No. 8	
0x09	No. 9	
0x0A	Number reset	Sent the number of Cleared
0x0B	Confirm choosing song	Cooperate with Numbers to achieve.
0x0C	Volume setting	
0x0D	EQ setting	
0x0E	Loop mode setting	
0x0F	Channel setting	
0x10	Interplay song setting	
0x11	Play	Note: "selection" and "interplay" are played according to the track name, for example, the track is named "00123. Mp3", and the selected data is "0x01", "0x02" "0x03" "0x0B", and the selection is completed.
0x12	Pause	
0x13	Stop	
0x14	Previous	
0x15	Previous directory	
0x16	Next directory	<p>PA1 DATA</p> <p>>2ms >1200us >400us >400us >1200us</p> <p>>200us</p> <p>High Level : Low Level = 1 : 3 Mean: 0</p> <p>High Level : Low Level = 3 : 1 Mean: 1</p>
0x17	SD card selection	
0x18	SD card selection	
0x19	U disk selection	
0x1A	FLASH selection	
0x1B	System sleep	
0x1C	Stop Playing	



