DY-HV20T 20W Amplifier Voice Playback Module

1.Introduction:

DY-HV20T 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 20W Class D amplifier circuit and can directly drive 4ohm/20W 8ohm/10W speakers.Support MP3,WAV decoding format. Max support 32Gbit(4MByte) TF card memory which can connect the computer to update TF card to store audio files via USB cable. It has 3.5mm audio interface, U disk interface,Micro USB download interface, button module in one module.

2.Feature:

1>.Intelligent Voice Playback. 2 Single control , 2 Loop control , UART control, One_line control mode within 7 control modes.and Play up to 8 or 255 musics which can meet the needs of different scenarios.

2>.Mono 20W Class D Amplifier. It has a built-in amplifier, not only direct AUX passive audio output to such as earphone, but also active output which can connected to 4ohm 20W speaker directly.

3>.32G TF Card Socket. It can support up to 32G TF card which be able to store more than enough music files.Users can download and update voice files directly via USB, which is very fast and easy to use.

4>.Adjustable Volume. The built-in potentiometer can adjust the volume and ultra-small size.

5>.Programmable Control. Users can not only control by simple buttons, but also connect to control devices such as MCU or PLC to complete music playback by command, integrated into their own embedded devices

3.Function:

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 20W Class D amplifier circuit and can directly drive 4ohm/20W 8ohm/10W speaker.

4.Parameter:

1>.Product Name:DY-HV20T20W Amplifier Voice Playback Module

2>.Product Number:DY-HV20T

3>.Work Voltage:DC 6V-35V

4>.Work Mode: 4-Kinds I/O, UART, ONE_Line, Standard MP3

5>.File Format: MP3,WAV

6>.Speaker Power: 20W/4ohm, 10W/8ohm

7>.TF Card Type:32G(Max and NOT included)

8>.Audio Output: Active/passive output

9>.Adjust Volume: Yes

10>.Work Humidity:5%~95%RH

11>.Size(Installed):122*66*30mm

12>.Size :50*50*12mm

5.Frequently asked questions

1>.Does it support key recording?

A : No,It does not.It just support USB. Download new music file by micro USB.

2>.Can it play more than one file?

A : Yes,it can play more than one music.

3>.My computer does not recognize the device when i plug in the USB cable. the charging light comes on but nothing else. what can i do?

A : Please try use another USB data cable or PC to test it.Recommend using windows.

6.Application:

1>.DIY greeting card

2>.Music Box

3>.Toy/Gift Boxes

4>.Cake box

5>.Memorial album

7.Package:

1>.1pcs DY-HV20T20W Amplifier Voice Playback Module

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 low 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	
1	1	1	1	1	1	1	0	00001.mp3	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 signal during playing and stop after end of song. It will play repeatedly if keep input. Busy pin output valid signal(High) during playing.Music control as following.
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	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.
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	I/O0-I/O7 controls 8 songs.It will stop playing current song to end after I/O0-7 release input signal(return to high);It will playing new song when get new 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.
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	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.
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	

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 "ZK" 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

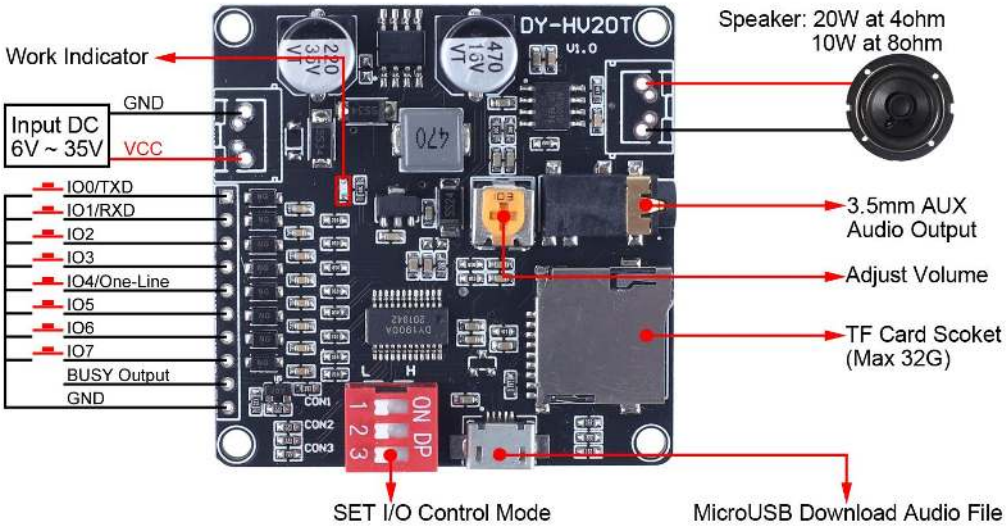
Control Command			Query Command		
Command	Command Code	Return	Command	Command code	Return
Play	AA 02 00 AC	None	Query play status	AA 01 00 AB	AA 01 01, play status, SM
Pause	AA 03 00 AD	None	Query current online drive	AA 09 00 B3	AA 09 01, drive, SM
Stop	AA 04 00 AE	None	Query current play drive	AA 0A 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

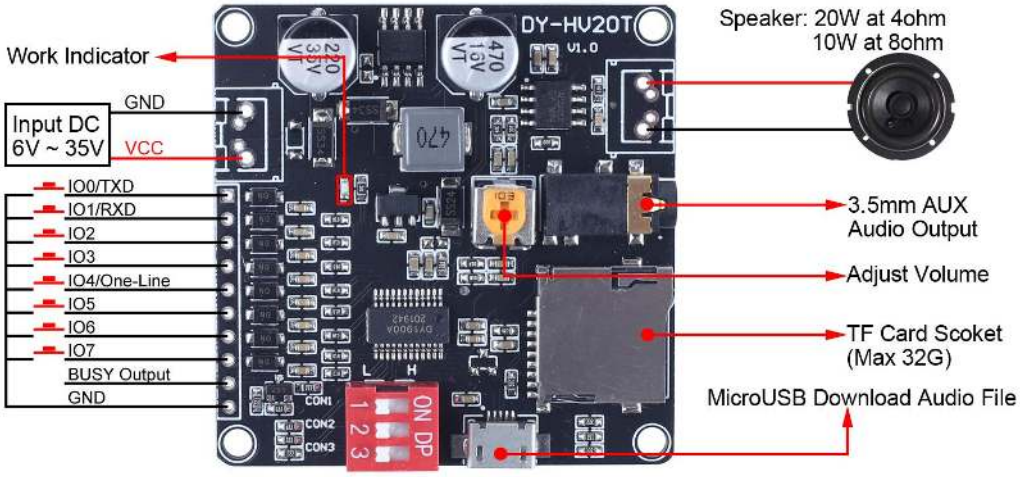
One_line Single Bus Mode		
Command(HEX)	Function	Note
0x00	No. 0	The number 0-9 has corresponding functions, such as selecting music, setting the volume, setting EQ, setting cycle mode, setting channel, setting the repertoire, and sending the digital at first and then send function command.
0x01	No. 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	
0x17	SD card selection	
0x18	SD card selection	
0x19	U disk selection	
0x1A	FLASH selection	
0x1B	System sleep	
0x1C	Stop Playing	

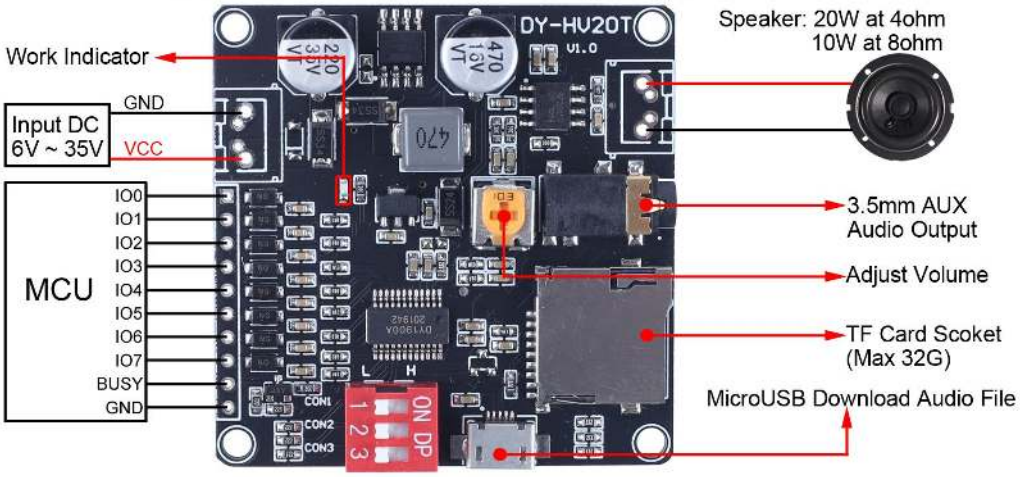


Set Mode	Switch Value			Control Mode	GPIO Function							
	CON3	CON2	CON1		IO7	IO6	IO5	IO4	IO3	IO2	IO1	IO0
	0	0	0	I/O Integrated Mode 0	Play music by buttons and play up to 255 songs							
	0	0	1	I/O Integrated Mode 1	Play music by input signal and play up to 255 songs							
	0	1	0	I/O Independent Mode 0	Song8	Song7	Song6	Song5	Song4	Song3	Song2	Song1
	0	1	1	I/O Independent Mode 1	Song8	Song7	Song6	Song5	Song4	Song3	Song2	Song1
	1	0	0	UART Mode							RXD	TXD
				One_Line Mode				RXD				
	1	0	1	Standard MP3 Mode				RPT	EQ	P/P/ Mode	PREV /VOL-	NEXT /VOL+

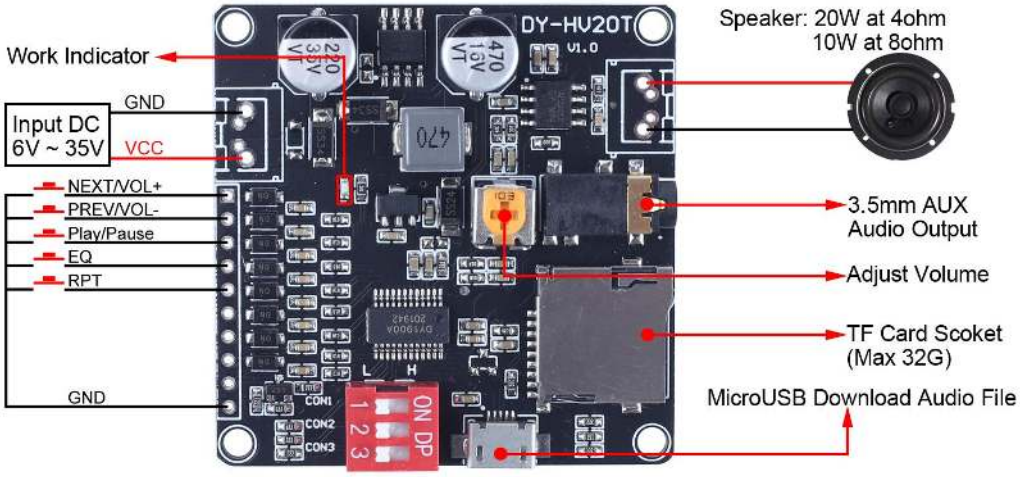
I/O Independent Mode Wiring Diagram



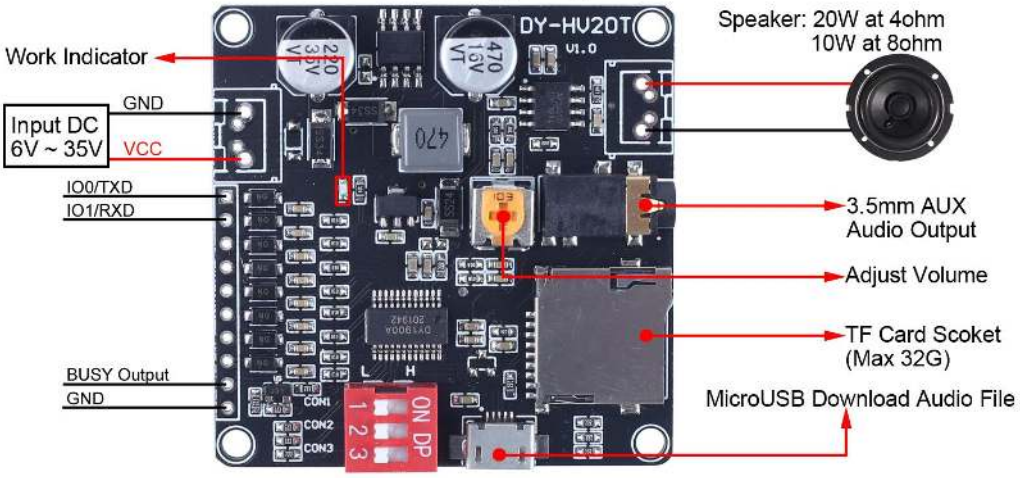
I/O Independent Mode Wiring Diagram



MP3 Mode Wiring Diagram



UART Mode Wiring Diagram



One_Line Mode Wiring Diagram

