

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 | 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 | 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 | 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 | 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 | 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 |

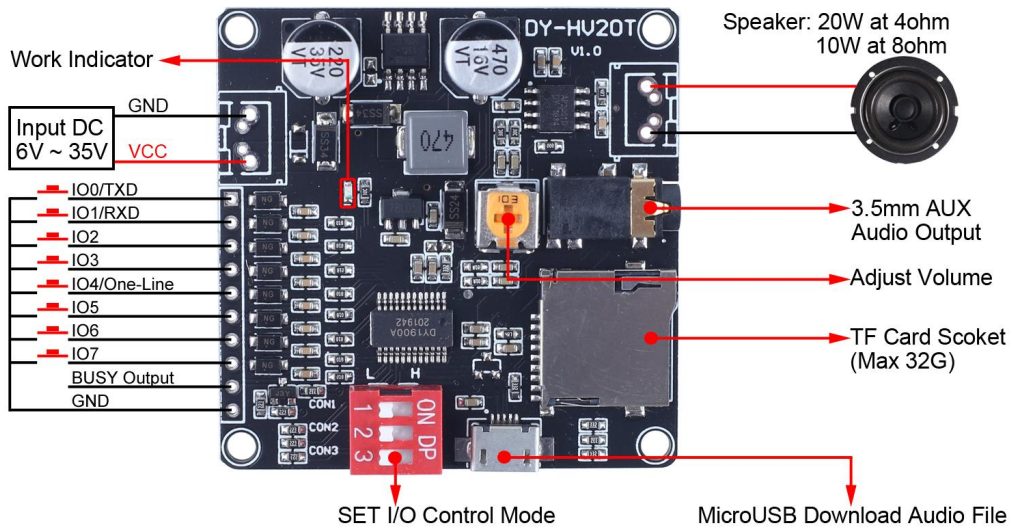
UART Communication Command

| 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 | | | |

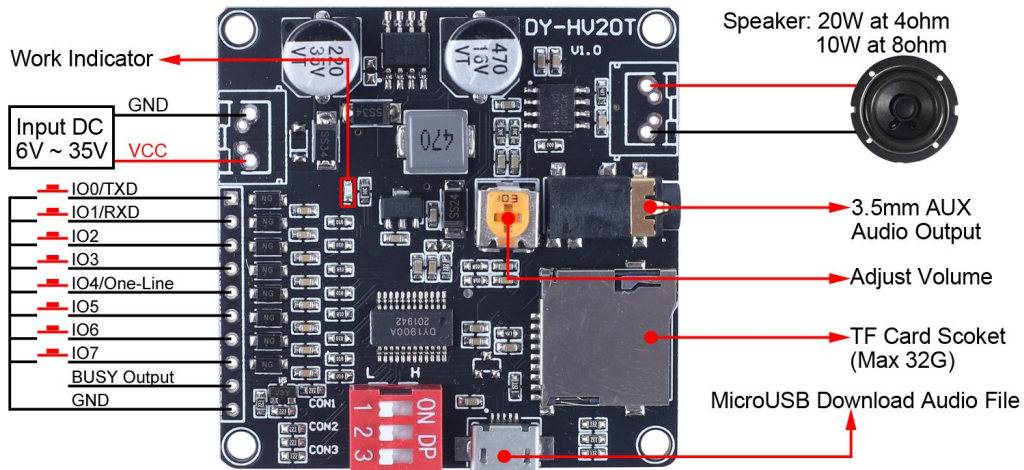
| Stop playing | AA 10 00 BA | None | |
|--------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| 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 | 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. | |
| 0x11 | Play | | |
| 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 |

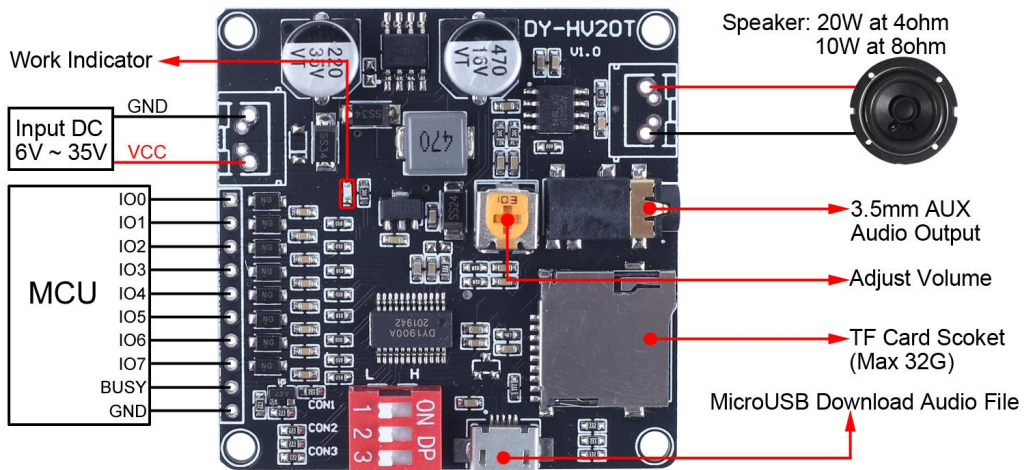


| Set Mode | Switch Value | | | Control Mode | GPIO Function | | | | | | | |
|----------------|--------------|------|------|------------------------|-----------------------------------------------------|-------|-------|-------|-------|-----------|------------|------------|
| | CON3 | CON2 | CON1 | | IO7 | IO6 | IO5 | IO4 | IO3 | IO2 | IO1 | IO0 |
| ON DP 1 2 3 | 0 | 0 | 0 | I/O Integrated Mode 0 | Play music by buttons and play up to 255 songs | | | | | | | |
| ON DP 1 2 3 | 0 | 0 | 1 | I/O Integrated Mode 1 | Play music by input signal and play up to 255 songs | | | | | | | |
| ON DP 1 2 3 | 0 | 1 | 0 | I/O Independent Mode 0 | Song8 | Song7 | Song6 | Song5 | Song4 | Song3 | Song2 | Song1 |
| ON DP 1 2 3 | 0 | 1 | 1 | I/O Independent Mode 1 | Song8 | Song7 | Song6 | Song5 | Song4 | Song3 | Song2 | Song1 |
| ON DP 1 2 3 | 1 | 0 | 0 | UART Mode | | | | | | | RXD | TXD |
| | | | | One_Line Mode | | | | RXD | | | | |
| ON DP 1 2 3 | 1 | 0 | 1 | Standard MP3 Mode | | | | RPT | EQ | P/P/ Mode | PREV /VOL- | NEXT /VOL+ |

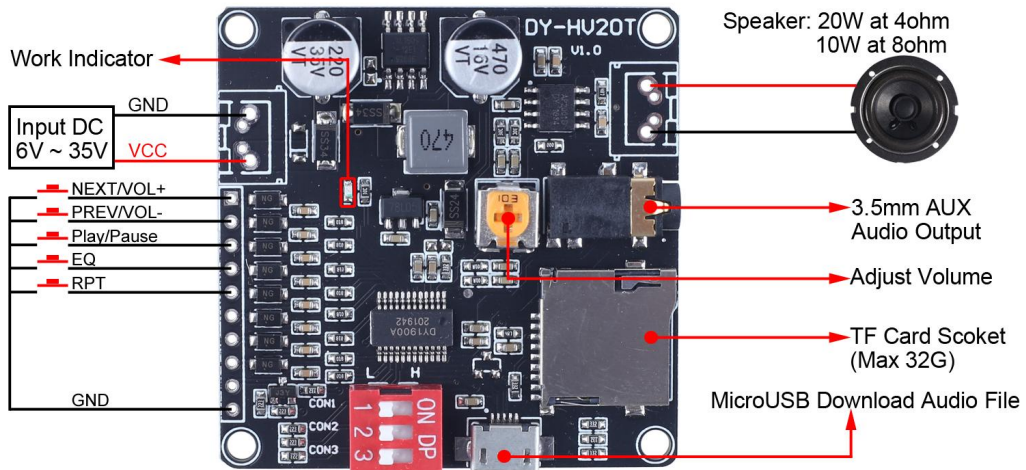
I/O Independent Mode Wiring Diagram



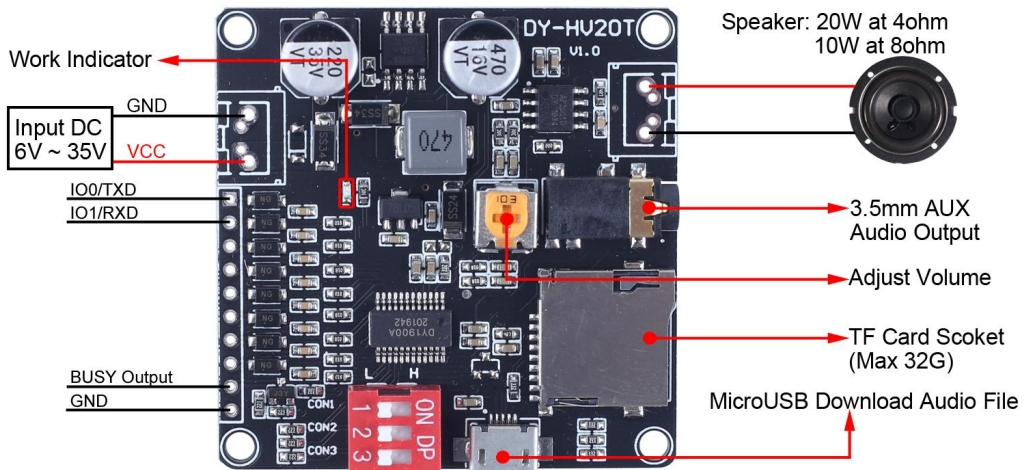
I/O Independent Mode Wiring Diagram



MP3 Mode Wiring Diagram



UART Mode Wiring Diagram



One_Line Mode Wiring Diagram

