PEMENOL GY16922

PEMENOL DY-HV8F Voice Playback Module Instruction Manual

Model: GY16922

1. Introduction

The PEMENOL DY-HV8F is an intelligent voice playback module designed for various electronic applications. It features a 20W Class D power amplifier, 8MB (64Mbit) flash storage, and supports MP3/WAV audio formats. This module offers multiple control modes, including I/O segmentation trigger, UART serial port control, and ONE_line single bus serial port control, making it versatile for DIY projects, industrial control, and interactive displays.

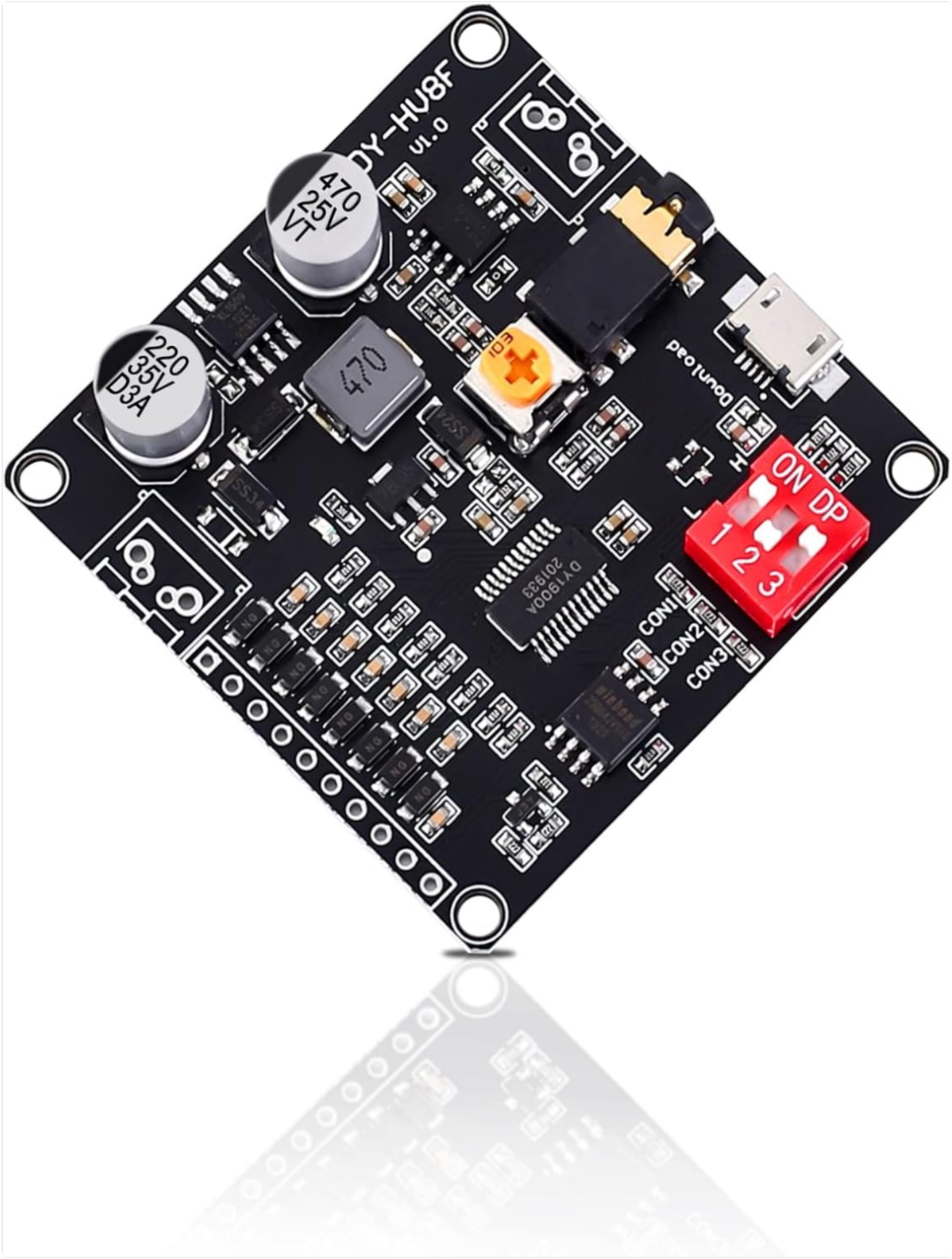


Figure 1.1: Top view of the PEMENOL DY-HV8F Voice Playback Module, showcasing its compact design and various components.

2. Product Features

- **Intelligent Control:** Integrates I/O segmentation trigger, UART serial port control, ONE_line single bus serial port control, and standard MP3 control modes.

- **High Power Output:** Onboard 20W Class D power amplifier circuit, capable of directly driving an 8ohm/10W or 4ohm/20W speaker.
- **Audio Format Support:** Supports MP3 and WAV decoding formats.
- **Internal Storage:** Features 64Mbit (8Mbyte) flash memory for audio file storage, eliminating the need for external memory cards.
- **Easy File Update:** Audio files can be updated by connecting the module to a computer via a Micro USB cable.
- **Integrated Interfaces:** Includes a 3.5mm audio interface, Micro USB download interface, and button module.
- **UART Serial Port Control:** Supports voice broadcast functions with control over play, pause, next, previous, volume adjustment, and selection of up to 65535 songs. Baud rate: 9600bit/s.
- **Wide Sampling Frequency Support:** Compatible with sampling frequencies (KHz) of 8/11.025/12/16/22.05/24/32/44.1/48.
- **High Fidelity Audio:** 24-bit DAC output with 90dB dynamic range and 85dB signal-to-noise ratio.
- **Configurable I/O Modes:** Supports 3 configuration I/O mode selections, enabling 7 distinct working modes.

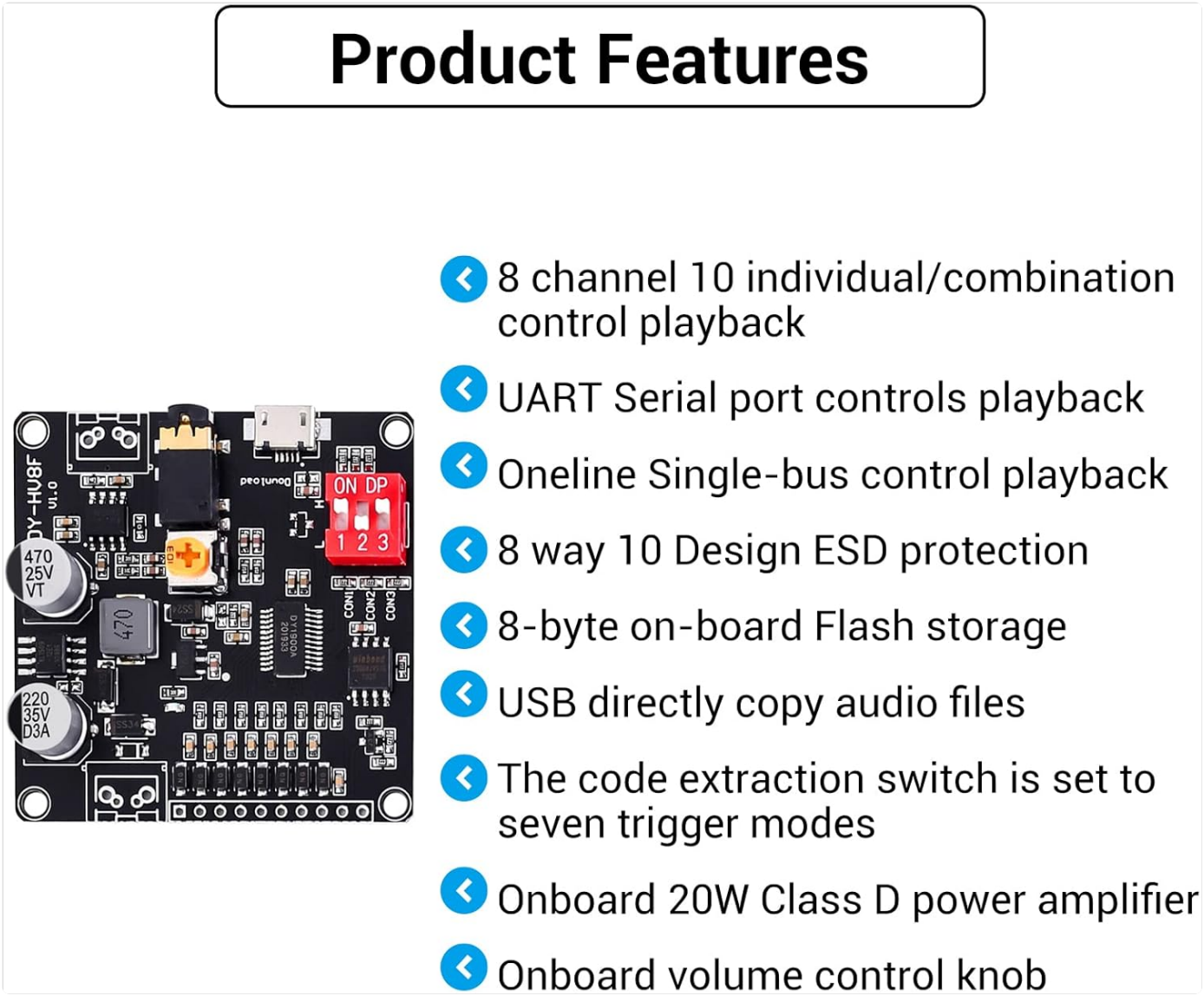


Figure 2.1: Visual representation of the key features, including 8-channel control, UART, Oneline control, ESD protection, 8-byte flash, USB file copy, 7 trigger modes, 20W amplifier, and volume knob.

3. Specifications

Attribute	Value
Product Dimensions	1.97 x 1.97 x 0.2 inches

Item Weight	0.317 ounces
Model Number	GY16922
Manufacturer	PEMENOL
Compatible Devices	Personal Computer (for file transfer)
Hardware Interface	USB (Micro USB)
Audio Formats	MP3 Audio, WAV
Headphones Jack	3.5 millimeters
Memory Storage Capacity	8 MB (64Mbit)
Digital Recording Time	55 minutes (approximate, depends on audio quality)
Microphone Operation Mode	Mono (playback)
Power Input	DC 6-35V
Amplifier Output	20W Class D (8ohm/10W or 4ohm/20W speaker)

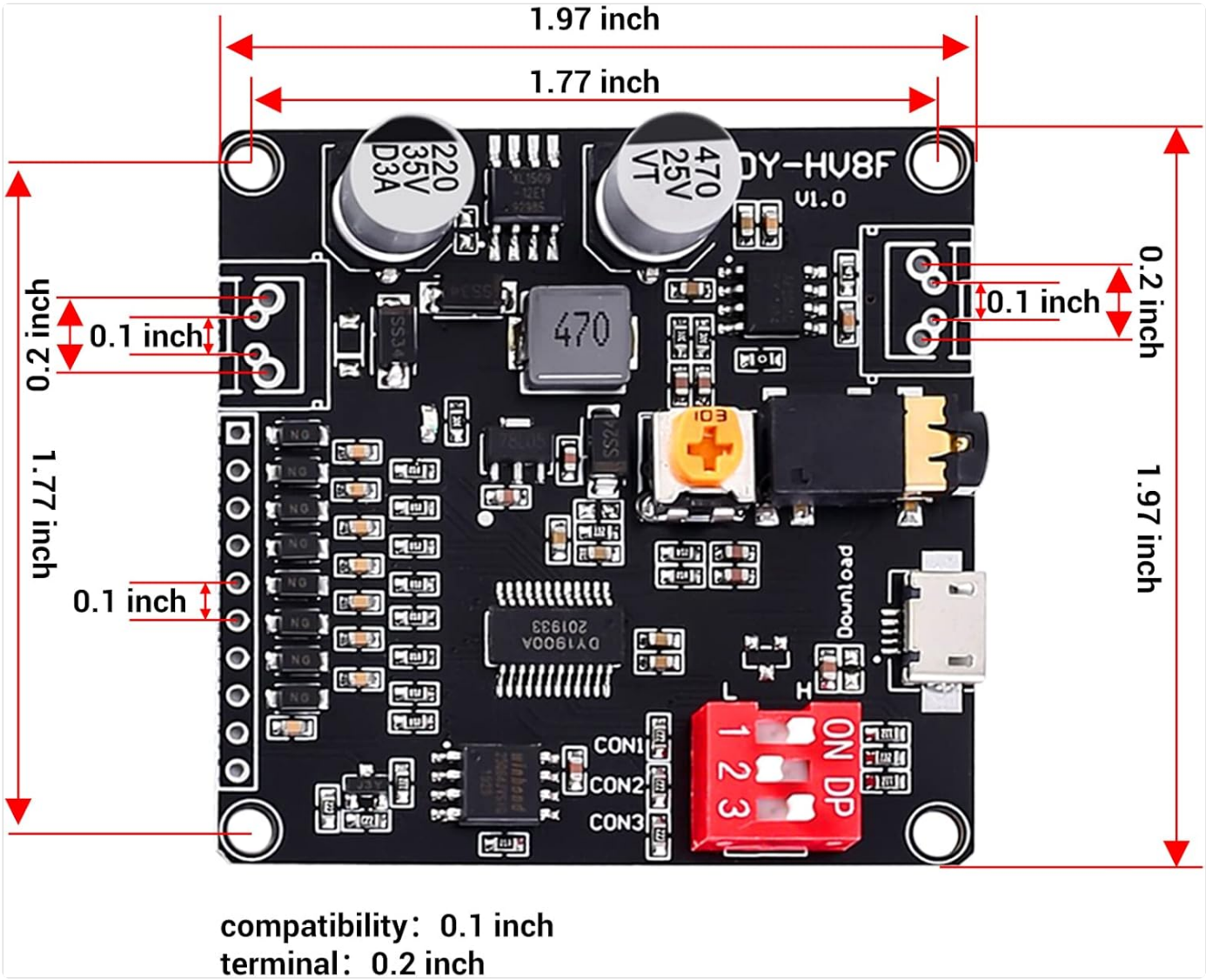


Figure 3.1: Detailed dimensions of the DY-HV8F module, showing its compact size for integration into various projects.

4. Setup and Connections

This section details the necessary connections for the DY-HV8F voice playback module.

4.1 Power Supply

Connect a DC power supply within the range of 6V to 35V to the designated input terminals. Ensure correct polarity to prevent damage to the module.

4.2 Speaker Connection

The module features an onboard 20W Class D amplifier. Connect an 8ohm/10W or 4ohm/20W speaker directly to the speaker output terminals. For optimal performance, match the speaker impedance and power rating to the module's capabilities.

4.3 Audio Output (3.5mm Jack)

A 3.5mm audio jack is provided for connecting headphones or an external amplifier, if direct speaker drive is not desired or if higher power output is needed via an external amplifier.

4.4 Micro USB Interface

The Micro USB port serves two primary functions:

- **Audio File Download:** Connect the module to a computer using a Micro USB cable to transfer MP3 or WAV audio files to the module's internal 8MB flash storage. The module will appear as a removable disk drive.
- **Power Supply:** In some low-power applications, the module can be powered via the Micro USB port, though a dedicated DC input is recommended for stable operation, especially when driving speakers at higher volumes.

4.5 I/O Control Pins

The module provides several I/O pins (IO0-IO7, BUSY, GND) for external control and status feedback. These pins are used in conjunction with the dip switch settings to trigger specific voice playback actions or modes.

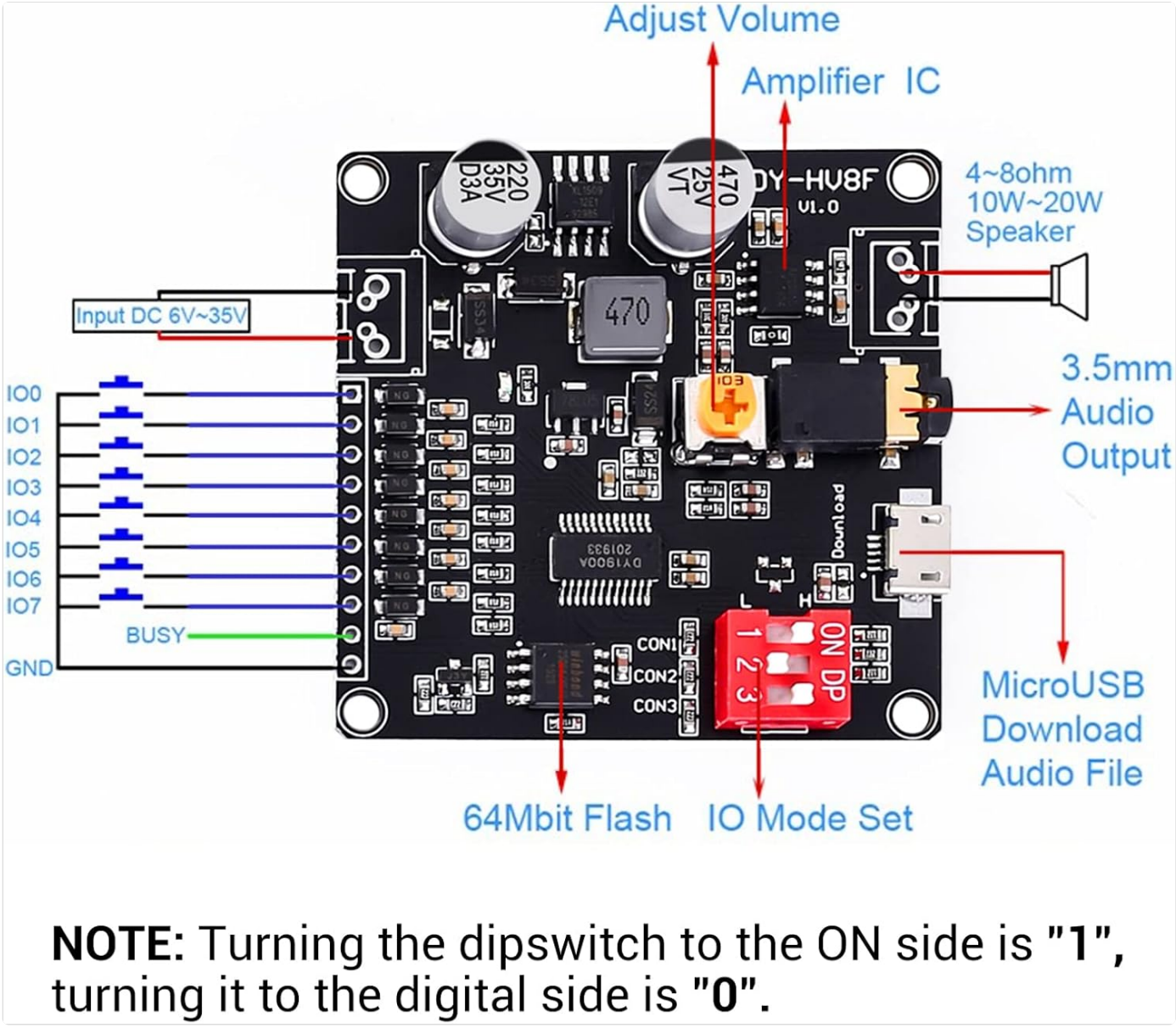


Figure 4.1: Detailed connection diagram showing power input, I/O pins, speaker output, 3.5mm audio output, Micro USB port, volume adjustment knob, and 64Mbit flash memory location.

5. Operating Modes and Configuration

The DY-HV8F module supports 7 distinct operating modes, configured using the onboard 3-position DIP switch. Each mode dictates how the module responds to external triggers or serial commands.

5.1 DIP Switch Configuration

The DIP switch has three individual switches (1, 2, 3). "ON" corresponds to a logical "1", and "DP" (down position) corresponds to a logical "0". The combination of these switch settings determines the module's operating mode.

7 Modes

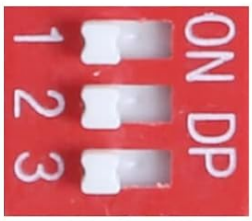
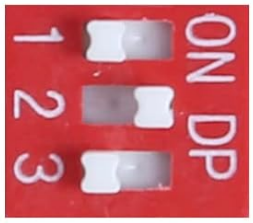
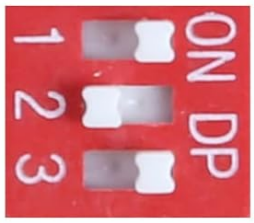
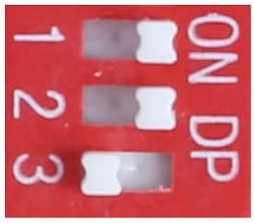
Trigger mode	Dipswitch settings	Trigger mode	Dipswitch settings
I/O combination mode 0		UART serial port mode	
I/O combination mode 1		1-wire serial port mode	
I/O independent mode 0		Standard MP3 mode	
I/O independent mode 1			

Figure 5.1: Table illustrating the 7 trigger modes and their corresponding DIP switch settings. "ON" indicates the switch is in the 'ON' position, and 'DP' indicates the switch is in the 'down' position (off).

5.2 Mode Descriptions

- **I/O Combination Mode 0 & 1:** These modes utilize combinations of the I/O pins (IO0-IO7) to trigger specific audio files. The exact mapping of I/O combinations to audio files should be referenced in the module's detailed programming guide (not provided here, but implied by "I/O segmentation trigger").
- **I/O Independent Mode 0 & 1:** In these modes, each I/O pin can independently trigger a specific audio file. This is useful for simple button-press or sensor-triggered playback.
- **UART Serial Port Mode:** This mode enables control of the module via a UART serial interface. Commands can be sent from a microcontroller (e.g., Arduino) to play, pause, select tracks (up to 65535), and adjust volume. The baud rate is 9600bit/s.
- **1-Wire Serial Port Mode:** Similar to UART, but uses a single data line for communication, simplifying wiring.
- **Standard MP3 Mode:** This mode typically allows for basic playback control, often through dedicated control pins or a simplified serial protocol, suitable for standard MP3 player functionalities.

5.3 Audio File Management

To load audio files onto the module:

1. Ensure the module is powered off or disconnected from any active control system.
2. Connect the module to your computer using a Micro USB cable.
3. The module should appear as a removable storage device (e.g., "DY-HV8F" or similar).
4. Copy your MP3 or WAV audio files directly into the root directory or designated folders on the module's internal storage.
5. Safely eject the removable disk from your computer before disconnecting the USB cable.
6. The module will automatically index the new audio files.

Note: Ensure audio files are properly formatted (MP3 or WAV) and within the module's supported sampling frequencies for optimal playback.

5.4 Volume Adjustment

The module features an onboard potentiometer (small orange knob) for manual volume adjustment. Turn the knob clockwise to increase volume and counter-clockwise to decrease it.

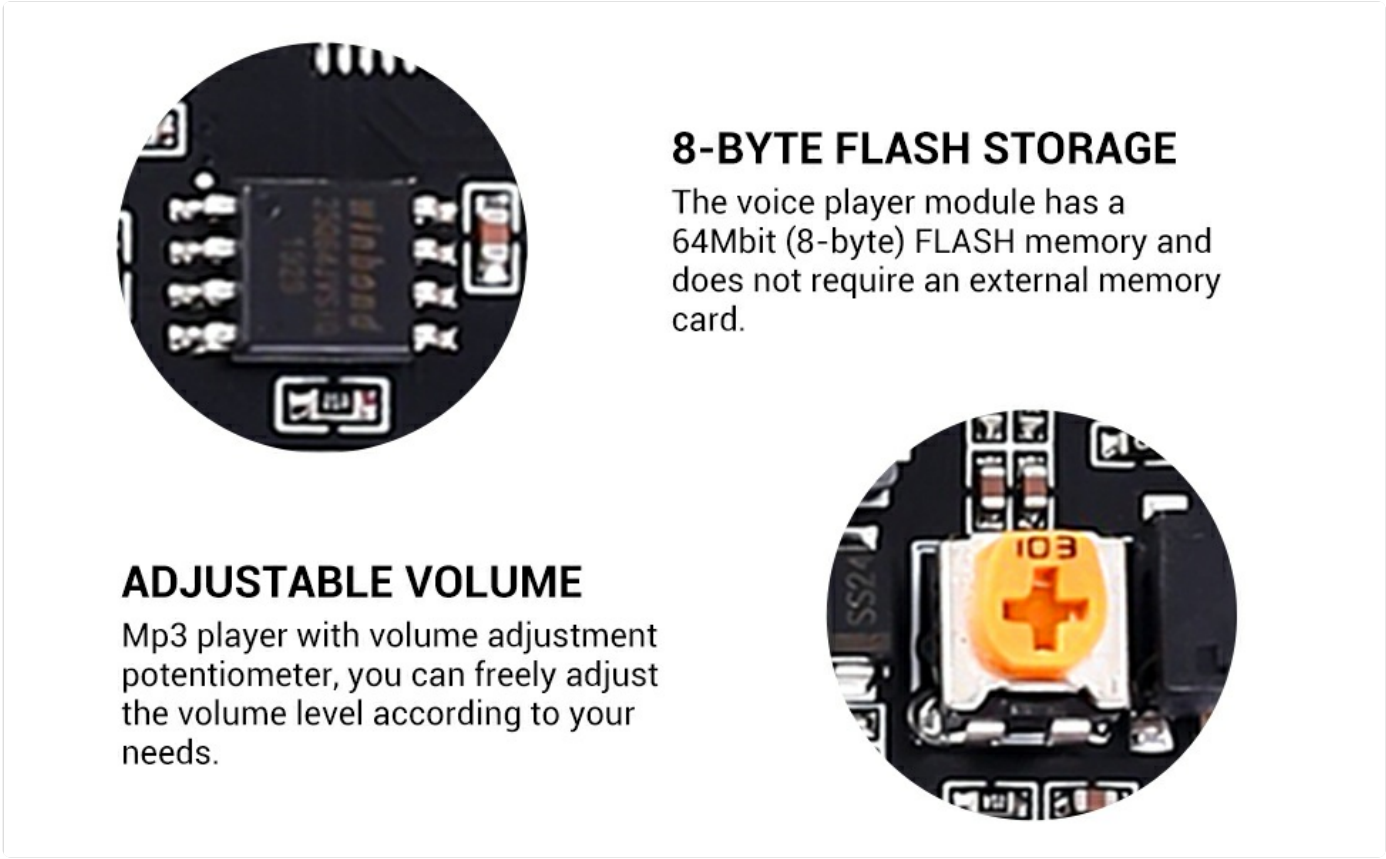


Figure 5.2: Close-up views highlighting the 20W Class D amplifier, the 8-byte flash storage chip, and the adjustable volume potentiometer.

6. Maintenance

The PEMENOL DY-HV8F module is designed for durability and requires minimal maintenance. Follow these guidelines to ensure its longevity:

- **Cleaning:** Keep the module free from dust and debris. Use a soft, dry cloth or a brush to gently clean the surface. Avoid using liquid cleaners or solvents.
- **Storage:** When not in use, store the module in a dry, cool environment, away from direct sunlight and extreme temperatures.
- **Handling:** Handle the module by its edges to avoid touching sensitive electronic components. Static electricity can damage the module, so use anti-static precautions if possible.
- **Power Supply:** Always use a stable and regulated power supply within the specified voltage range (DC 6-35V). Unstable power can lead to erratic behavior or damage.

- **Connections:** Ensure all connections (power, speaker, I/O) are secure and correctly polarized before applying power. Loose connections can cause intermittent operation or short circuits.

7. Troubleshooting

This section provides solutions to common issues you might encounter with the DY-HV8F voice playback module.

Problem	Possible Cause	Solution
No sound output.	◦ Incorrect power supply. ◦ Speaker not connected or faulty. ◦ Volume too low. ◦ No audio files loaded. ◦ Incorrect operating mode.	◦ Verify power input (DC 6-35V) and polarity. ◦ Check speaker connections and test the speaker. ◦ Adjust the onboard volume knob clockwise. ◦ Connect via USB and ensure audio files are present. ◦ Verify DIP switch settings match desired operating mode.
Module not recognized by computer via USB.	◦ Faulty USB cable. ◦ USB port issue on computer. ◦ Module not powered correctly.	◦ Try a different Micro USB cable. ◦ Try a different USB port on your computer. ◦ Ensure the module is receiving sufficient power.
Audio playback is distorted or choppy.	◦ Speaker impedance mismatch. ◦ Audio file quality is poor. ◦ Power supply is unstable or insufficient. ◦ Volume set too high (clipping).	◦ Ensure speaker is 8ohm/10W or 4ohm/20W. ◦ Use high-quality MP3/WAV files. ◦ Verify power supply stability and current capacity. ◦ Reduce the volume using the onboard knob.
Module does not respond to I/O triggers.	◦ Incorrect DIP switch setting. ◦ I/O pins incorrectly wired. ◦ Trigger signal is not valid.	◦ Check Figure 5.1 for correct DIP switch settings for I/O modes. ◦ Verify wiring of I/O pins to your control circuit. ◦ Ensure trigger signals meet the module's requirements (e.g., voltage levels).

8. Safety Information

Please read and adhere to the following safety precautions to prevent injury or damage to the module:

- **Electrical Safety:** Always disconnect power before making or changing any connections. Do not exceed the specified input voltage range (DC 6-35V).
- **Static Discharge:** Electronic components are sensitive to electrostatic discharge (ESD). Handle the module in an ESD-safe environment or take precautions such as wearing an anti-static wrist strap.
- **Environment:** Do not expose the module to moisture, extreme temperatures, or corrosive environments. Operate it in a well-ventilated area.

- **Short Circuits:** Ensure no metal objects or wires accidentally short-circuit the module's pins or components.
- **Children:** Keep the module out of reach of children, as it contains small parts that could be a choking hazard.
- **Modifications:** Do not attempt to modify or repair the module yourself. Unauthorized modifications can void the warranty and pose safety risks.

9. Warranty and Support

This PEMENOL product is covered by a standard manufacturer's warranty. For specific warranty terms, duration, and support inquiries, please refer to the documentation included with your purchase or contact PEMENOL customer support directly through their official website or the platform where the product was purchased.
PEMENOL Customer Support: Visit the PEMENOL Store on Amazon