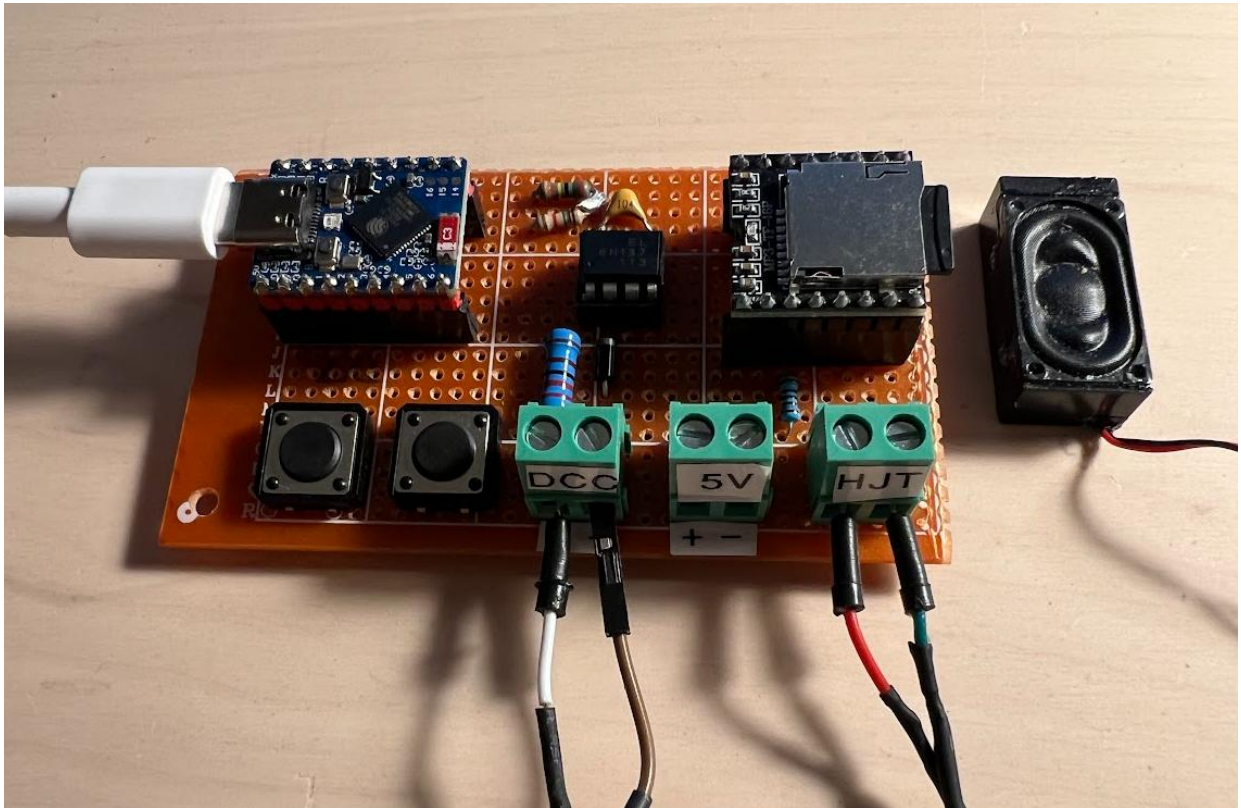


Project UNION

MP3 Player

Overview and Quick User Guide | Firmware U3.21 | October 2026

Compact sound playback for model railways — controlled from a browser, DCC or MQTT.



1. What can the MP3 Player do?

The Project UNION MP3 Player combines a compact ESP32-S3 Zero controller, a DFPlayer Mini MP3 module and a DCC input. Sound effects can be started and controlled from a web interface, by DCC accessory commands or through MQTT. Configuration is available in Danish, English and German.

- Play MP3 sound effects through a connected speaker.
- Test playback and adjust volume from a web browser (0–30).
- Choose a simple Ordinary Mode or a more flexible Expert Mode.
- Assign DCC actions to sounds, playlists and playback controls.
- Integrate sound playback with other systems through MQTT.
- Save and restore configuration using a JSON backup.

2. Connect to the web interface

After the device has been connected to your Wi-Fi network, open a browser on a computer, tablet or phone on the same network:

<http://mp3-player.local>

The default hostname is mp3-player. It can be changed in the Wi-Fi settings; if changed, use the new hostname. The initial Wi-Fi setup access point is named MP3-Player-Setup.

The screenshot displays the MP3 Player web interface. On the left is a dark sidebar with the MP3 Player logo (a musical note with a Wi-Fi signal) and the text "MP3 Player ESP32-S3 + DCC, DFPlayer and MQTT". Below this are three flags for Denmark (DK), Great Britain (GB), and Germany (D). The sidebar menu includes: MP3 Test (selected), MP3 Config, Tracks, Playlists, DCC, MQTT, MQTT Control, Status, WiFi, System, Firmware, and Info.

The main content area is titled "MP3 Test" and shows "SD: /mp3 / numbered files". It features an "Expert mode – Playlist" section with a "Select playlist" dropdown menu showing "1 – Church" and a "Play playlist" button. Below this is a "Track number" input field with the value "1" and four playback buttons: "Previous", "Play", "Pause", and "Next". A volume slider is shown with the text "Volume 21 / 30". At the bottom, there are links for "Track list" and "Playlists".

3. Choose your SD card mode

Open MP3 Config and choose one of the following modes. Select the startup volume and playback behaviour, then save the settings.

Ordinary Mode — the simplest way to start

Copy MP3 files to the root of the DFPlayer microSD card. No special filenames or manual track catalogue are needed. The DFPlayer assigns its own file indexes, which are used for playback. The index order may differ from alphabetical filename order.

Expert Mode — numbered tracks and playlists

Create a folder named /mp3 on the microSD card. Name files with a unique four-digit track number, for example 0010_churchbell.mp3, 0020_rooster.mp3 or 0040_whistle.mp3. Register the track numbers and descriptive labels on the Tracks page. You can then create up to four named playlists, each containing an ordered selection of tracks.

Why no SD card browser? The microSD card belongs to the DFPlayer Mini. The ESP32 communicates with it over UART and cannot read its directory or filenames. In Expert Mode, the track catalogue is therefore maintained manually.

MP3 Config

SD card mode	Ordinary: MP3 files in card root (DFPlayer file index) ☐ Expert: /mp3 with 0001_Name.mp3 and playlists ☒
Startup volume	21 / 30 <input type="range"/>
Playback	Play selected track only ☐ Play all tracks in sequence ☒ Repeat selected track ☐

Applies to Web, DCC and MQTT. Stop always ends playback.

4. Test sound playback

Open MP3 Test. Enter a track number, press Play, and use Pause/Resume, Previous, Next and Stop as needed. Adjust the volume with the slider. In Expert Mode you can also select and start a playlist directly from this page.

Playback options in MP3 Config include playing only the selected track, playing tracks in sequence and repeating the selected track. A playlist follows its own defined order.

MP3 Test

SD: /mp3 / numbered files

Expert mode – Playlist

Select playlist

1 – Church

▶ Play playlist

Track number

1

◀◀ Previous

▶ Play

⏏ Pause

Next ▶▶

Volume 21 / 30

[Track list](#) · [Playlists](#)

5. Configure tracks and playlists (Expert Mode)

Open Tracks to register the numbers used in the /mp3 folder and add meaningful descriptions. This list is for configuration and selection; it is not an automatic listing of SD card contents.

Open Playlists to name and configure up to four playlists. Add the desired track numbers in playback order, save, and use the Play button to test the result. For example, a “Railway sounds” playlist could contain a whistle, a station announcement and other layout sounds.

Expert mode – Track list

Copy MP3 files into /mp3 on the SD card. Each filename must start with a unique four-digit number 0001–9999, followed by _ and an optional name, e.g. 0010_churchbell.mp3. Do not reuse a number. Register numbers and descriptions here; files are not read automatically.

Nr.	Description	Test	
10	churchbell	 	
12	Bigben	 	
14	Kapelle	 	
20	rooster	 	
22	rooster_short	 	
24	Chickens	 	

Expert mode – Playlists

Playlist 1

Description

Choose track numbers in order. Empty entries are ignored. Tracks may repeat.

#	Track number / name
1	10 10 - churchbell
2	12 12 - Bigben
3	14 14 - Kapelle

6. Control sounds via DCC

Open DCC to configure accessory addresses and actions. Each address can have separate red/left and green/right commands. Assign the desired action, save the configuration, and use the available test controls before testing from the digital command station.

The DCC input uses the 6N137 optocoupler and GPIO11 on the ESP32-S3. The project supports a configurable range of up to 30 accessory addresses (two directions per address).

DCC

DCC input: GPIO11 -
Last: -

DCC address range

First DCC address

Number of addresses

Apply

DCC actions

Address	Direction	Action	Test
201	Red / left	Stop ▾	
201	Green / right	Play ▾	
202	Red / left	Pause ▾	
202	Green / right	10 - churchbell ▾	

7. Control sounds via MQTT

Configure the MQTT connection and topics on the MQTT pages. The default base topic is WDP/MP3Player; individual command topics are configurable. Typical commands include Play, Stop, Pause, Volume, track number (SangNr) and Playlist. The playlist topic accepts numbers 1–4.

For example, with the default topic names, publishing 2 to WDP/MP3Player/Playlist selects playlist 2. Verify the actual topic settings in your device before integrating with an automation system.

MQTT

MQTT

StatusOK

Broker

InfoOK

AktivJa

TLSJa

Broker

Port8883

User

Pass

Gem

Test

MQTT Control

MQTT

StatusOK

Broker

InfoOK

Broker, port, TLS and login: [MQTT settings](#). Topics under MQTT.

Command	Topic	Payload
Play	WDP/MP3Player/Play	1
Stop	WDP/MP3Player/Stop	1
Pause	WDP/MP3Player/Pause	1
Track number	WDP/MP3Player/SangNr	3
Volume	WDP/MP3Player/Volumen	20
Playlist	WDP/MP3Player/Playlist	1-4

MQTT Test

Publish an MQTT command through the broker (not directly to DFPlayer).

CommandPlay

Payload1

Publish MQTT

8. Backup, restore and firmware

Open System for Backup and Restore. Download a JSON backup after configuring tracks, playlists, DCC and MQTT, and keep a copy on your PC. Restore from a saved JSON file when required, then check the settings and restart to verify they remain saved.

The backup contains configuration data, not the MP3 files stored on the DFPlayer microSD card. Wi-Fi credentials are not included. Avoid “Erase All Flash” during ordinary firmware uploads unless a specific installation procedure requires it.

Use Firmware for software updates. Choose the firmware file, upload it and allow the device to restart. Keep a configuration backup before updating.

System

Hostname

mp3-player

Save

Version	U3.21 S3 DCC MQTT
UNION Core	0.3.4
Chip	ESP32-S3
Free heap	166276 bytes
Uptime	0:24:31

Restart

Factory reset

Backup and restore

Save or restore the MP3 Player configuration as a JSON file.

↓ Download backup (JSON)

↑ Restore backup

Firmware

Current version: MP3 Player U3.21 S3 DCC MQTT

Choose file

No file selected

Upload firmware

9. Practical tips

- Use a correctly prepared microSD card and check the chosen Ordinary/Expert directory layout.
- Start with a modest volume, then increase it using MP3 Test.
- If a track does not play in Expert Mode, verify its four-digit prefix and its registered track number.
- If mp3-player.local does not open, confirm the device and computer are on the same Wi-Fi network, or use the device IP address.
- Keep copies of both your MP3 files and the configuration backup.

Project information: <https://www.krogsgaardsmodelbane.dk/union/>