



Z-LIVEREC

Multitrack USB recorder/player for Raspberry PI 4 & Core Class Audio/ALSA Compliant devices

Z-LiveRec is a unique multitrack sound recorder and player, designed from the ground up to meet the specific needs of live sound engineers and musicians. It combines rock-solid operation with an intuitive graphical user interface. It's quick to set up, simple to use and very flexible.

It does all the things you'd expect of a multitrack recorder, so if you're familiar with recorders, you can probably install the software on a Raspberry PI, launch the application and get it to work.

Z-LiveRec also has a few features that go beyond what you usually see in a recorder. Some of these features are ability to record to one multitrack file, go beyond 4GB limit, up to 48 channels and be a player for virtual soundchecks. (without musicians or just let the band to listen to the PA mix.) News is that Z-LiveRec now includes a complete touch based graphical user interface and advanced export functions.

Raspberry PI is a very popular platform for everybody looking for a small system for all kinds of tasks - but the PI also comes packed with some great CPU power to perform certain demanding tasks. One of them to use it as a multitrack recorder/player for any USB Class Audio devices with ALSA support like Focusrite Scarlett, Zoom U24 and digital mixing consoles like Mackie DL-16S/DL-32S series, Behringer XR18/X32, Midas MR18 series. (More mixer vendors will probably work)

Raspberry PI have also support for touch screens - and Z-LiveRec have been developed to fit Raspberry PI with 3.5" touch displays and have a 100% touch based GUI.

With the Z-LiveRec for Raspberry PI and just adding the SoX library (Swiss army knife for audio) - live recordings/playbacks can be done over USB with 2-48 channels, 48KHz and 24bits into multitrack audio formats like WAV, CAF, AIFF or W64 directly to a USB 3.1 memory stick or SSD disk. These files can later be used directly in Apple Logic Pro X, Steinberg Cubase or Reaper etc and will show up as separate channels for further post production tasks or remixes.

Installation

The installation of Z-LiveRec is quite straight forward - the only needed file is the Z-LiveRec - which includes everything except 3 libraries. The normal setup scenario is the following:

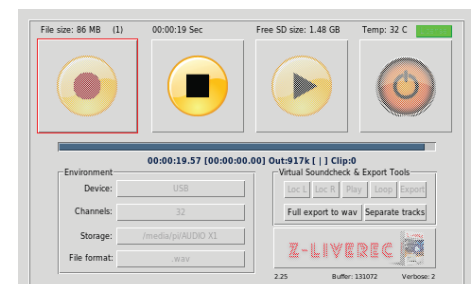
Pre-requirements

1. Raspberry PI 4 or 400
2. Keyboard & mouse (ev)
3. Hdmi cable and display if not attaching screen
4. Power USB-C (for PI 4)
5. USB 3.1 stick or SSD disk formatted (eg exFAT)
6. Network (cable or WiFi) during the initial setup - for license check.
7. Download and install the latest "Raspberry OS with Desktop" build from [Raspberrypi.org](https://www.raspberrypi.org) or visit this [post](#) on z-liverec.com how to create a optimized and minimal OS installation for Z-LiveRec.



Installation on Raspberry OS with Desktop / Raspberry PI 4

1. Load the LIBSoX library (Audio library for all kind of tasks) in a terminal window:
`> sudo apt-get install sox libsox-fmt-mp3`
2. If using NTFS or ExFat fileformat on the memory sticks - will enable recordings with larger files than 4GB.
 This is a addon on older Raspberry PI OS systems. (included in Raspberry PI OS Buster or Bullseye. A must when using bigger memory sticks 32GB-256GB. To handle ExFAT please, install the following library's from the terminal:
`> sudo apt-get install exfat-fuse`
`> sudo apt-get install exfat-utils`
3. Unzip the Z-LiveRec.zip and it (about 11-13MB) to your home directory on you Raspberry PI.(The manual is located in the zipfile.)
4. Attach your recording mixer/device via one of the USB 3 ports on Raspberry Pi 4 and attach an USB 3.1 based memory stick to an USB 3 port. (The two ports in the middle)
5. Start Z-LiveRec app - sometimes Raspberry requires changed access rights to the filesystem. To ensure that the app is executable run the command: `"chmod u+x Z-LiveRec"` in a terminal window where the app is located.
6. The Z-LiveRec app can also be started from the terminal by using the `"./Z-LiveRec"` as command.
7. For the full functionality in Z-LiveRec / you need internet access for registrating your license by clicking on the red license text using the licens info from the order mail (only done once at initial setup)



Operational

When recording with Z-LiveRec first time - the settings needs to be configured. The first parameter to set is the audio device for the recording/player - Just by using the dropdown box for the devices - the app will find all installed ALSA devices - just pick the right device. Do the same thing with the amount of recording channels for your device - e.g Mackie DL-32S, select 32 Channels or Behringer XR18 select 18 channels. Finally select the right partition/hard disk for recording e.g. the USB memory stick.

The home/pi directory or USB Stick will be shown

It is not recommended to record directly to the internal micro SD card where the OS is installed for the Raspberry PI - You will probably end up with a lot of buffer over-run issues. SSD disks are normally 4 times faster compared to SD Cards.

Last - just pick the requested audio format - see below file format section for recommendations.

The first time you record with Z-LiveRec, a configuration file will be created in the same directory as Z-LiveRec.exe is located. The config file is called Z-LiveRec.cfg. When restarting the application the last stored configuration will be loaded and presented in the app. Some fine tune parameters can now be found under the "license" button but is also located in the z-LiveRec.cfg file.

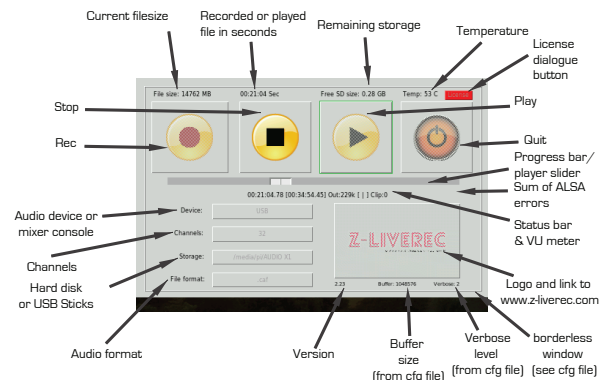
Now you are ready to record - by just pressing the REC button with a mouse or if using a touch screen, with your finger. Z-LiveRec will automatically create a new file with a filename based on the date and time + audio extension. Z-LiveRec will show the actual file size of the recording and how much hard disk space is left. You will also see a counter in red text, if running into buffer over-run problems or other alsa warnings. (Which could indicate that you have a too slow USB Stick - a USB 3.1 stick with transfer rates over 130MB/s for reading and 55 MB/s for writing is recommended)



Z-LiveRec includes some logics to handle harddisk storage issues, splitting files when recording wav files. You will also be able to see the temperature on the CPU - a normal temperature is around 74-80 degrees Celsius for a Raspberry PI 4 - and 35-40 degrees Celsius on Raspberry PI 400.

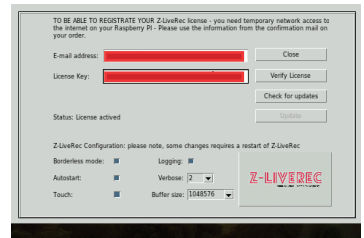
When clicking on the play button - a recorded file can be selected for multitrack replays back to the selected device - Z-LiveRec also knows which file that was last recorded - and will bring it up as default. The app will playback all recorded channels over USB. Z-LiveRec will determine channels, bit depth and format automatically. So if you have edited a wave file outside Z-LiveRec in DAW and saved in float 32 bit depth...Z-LiveRec will see this and ready the file and replay it to the mixer console. See the new functionality introduced in V2.25 - Virtual Soundcheck & Export Tools. In the same directory as Z-LiveRec remains, a Z-LiveRec.log file is created with all stored status like ALSA warnings and errors. If you see the ALSA counter increasing - you can always go back afterwards and look what happened in the log file for further investigations.

If you want to disable the log function - you can set the log=0 parameter located in the Z-LiveRec.cfg or in the GUI (Full version). The verbose parameter (default is 2) is used to track ALSA errors. If using 0, no errors will be captured on either the screen or in the log file, and between 1-7 a more deep logging will occur.

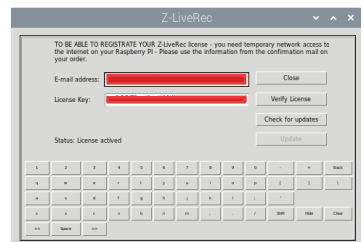


```
INFO:root:----- Playing -----
INFO:root:Z-LiveRec Version: 2.23 Demo
INFO:root:Date: 16/01/2022 19:11:39
INFO:root:File: /media/pi/AU000_XL/202209040747.caf
INFO:root:Channels: 32
INFO:root:Bits: 24
INFO:root:Buffer Size: 1048576
INFO:root:Temp: 36
INFO:root:File System: ext4
INFO:root:[u00N, 'alsa', 'can't', 'encode', '24-bit', 'Signed', 'Integer', 'PCM']
INFO:root:Temp: 37
INFO:root:[u00N, 'alsa', 'can't', 'encode', '24-bit', 'Signed', 'Integer', 'PCM']
INFO:root:Temp: 36
INFO:root:Time Recorded: 00:33:33 Sec
INFO:root:File Size Recorded: File size: 14762 MB
INFO:root:Temp: 34
INFO:root:----- New file recording -----
INFO:root:Z-LiveRec Version: 2.23
INFO:root:Date: 17/01/2022 12:10:50
INFO:root:File: /media/pi/AU000_XL/202201171137.caf
INFO:root:Channels: 32
INFO:root:Buffer Size: 1048576
INFO:root:Temp: 34
INFO:root:File System: ext4
INFO:root:
```

The buffer parameter found in Z-LiveRec.cfg or GUI is default set to 1048576 for good performance with all type of audio formats. (Some more values were added in V2.25 - 4GB buffer size can be used if experiencing buffer overruns) This parameter can be changed in the z-liverec.cfg for experimental purposes. The Z-LiveRec can get a bit more unresponsive/slower when a larger buffer is used but more reliable from a recording perspective. (less buffer over-runs). If experiencing a lot of buffer overruns in the GUI - you could go from exFAT file format to NTFS or change to a faster USB stick. See under tested hardware section.



If you want to run Z-LiveRec in borderless mode - change the decox=0 to 1 in the Z-LiveRec.cfg or in the GUI under the license button. A checkbox which handles Z-LiveRec to start when booting the OS. Z-LiveRec V2.19 and later have an auto update function built in found in the licence dialog for registered users. (Not present for the 64bit version of Z-Liverec) A 100% touch based GUI is available for the main screen and an on-screen keyboard and a nice transport slider when replaying recordings. To turn on the touch GUI - just mark the checkbox "Touch" and restart the application.



News in V2.25 is a function when quitting Z-LiveRec - is an option to also shutdown the complete Raspberry PI OS. This can be enabled by clicking the "Shutdown OS" option in the license dialogue checkbox.



In V2.25 we also added keyboard shortcuts ctrl + r(recording), p(playing), s(stop), x(Quit app) - which speeds up common tasks.

Audio Formats

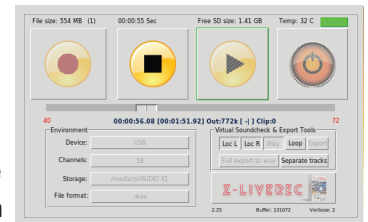
- Wav files - Up to 48 channels have been tested without any over-run buffer warnings and splitting the files in 2GBs portions up to of 32GB and more. Please note, to be compliant with Fat32 filesystem - the maximum file size for native wav files is 4GB - e.g. about 15 minutes when recording with 32 channels. Z-LiveRec splits wave files to a new file after every 2GB. News in V2.24 is that the split is done completely without any delays or glitches. We recommend using the W64 or CAF format instead to be able to record and address larger files than 4GB and using ExFat file systems. (Files of 64 GB have successfully been recorded with Z-LiveRec).
- CAF - Apple Core Audio Format - Up to 48 channels have been tested without any warnings and file sizes of 32GB imported into Garageband & Logic Pro X.
- W64 - Same format as .wav but without the limitation of 4GB on ExFat file systems. This format records over 32GB multitrack in a single file without any limitation. Tested and verified with Steinberg Cubase 11. (Please Note: W64 takes slightly more CPU power than wav & caf)
- pcmwave - for experimental uses.
- AIFF - older version of CAF.

Note: Multitrack file formats can be read directly by most DAWs on the market - no need to export it to separate wave files. If you need to export to separate wave files - Z-LiveRec can do this from version 2.25.

Hint: You can record a complete concert with 32 channels in CAF or W64 format...and then use the export function to cut and export the parts or songs you want to a single multitrack wave file or to 32 separate wave files.

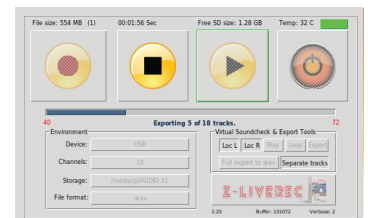
Z-LiveRec - the ultimate virtual soundcheck tool!

Added in v2.25 is a complete section called Virtual Soundcheck & Export tools is now available. Added now is the ability to set fixed locators when replaying recordings in the GUI. So when in play mode – the new Virtual Soundcheck & Export tools shows some new buttons. First the left & right locator which will set the play-area of an existing recording. Pressing “Play” will replay the recording between the locators. Pressing “loop” will keep playing repetely between the set locators. Very useful when doing virtual soundchecks.



Keyboard shortcuts are also added to set left/right locator by pressing ctrl F1 and ctrl F10. Ctrl F2 will start playing between the locators. Ctrl F3 will turn on "loop" replay - Ctrl F4 will turn off loop replay.

The export function found in the Virtual Soundcheck & Export tools – works like this - by pressing “export” when replaying sound files in locator mode – the selected area between the locators can be exported to a new wave file. (This can be done from any file format like *.wav, *.W64 or *.caf and these can be exported to *.wav format. The exports can be done to both to a single multitrack file or be split by channel to separate wav files. See button “Separate tracks”. This function is extremely useful when been recording a complete concert with 32 channels and you want to export a part or a song to a new separate file. By splitting all channels to separate files – any DAW on the market can be used for post-production tasks.



Virtual Soundcheck & Export tools – when in main screen – an export function is now available to export a complete recording from any file format like *.wav, *.W64 or *.caf to *.wav format. This can be done to both a single multitrack file or been split by track/channel to separate wav files. See button “Separate tracks”. Note – free storage space is needed on the same drive as the original file.

You can read and store exports to any directory on the same storage device.

Some General Notes/Recommendations

The system will warn if buffer over-runs occurs. All warnings are counted and logged in Z-LiveRec.log and these are visible in the Z-LiveRec app as a red counter behind the status bar.

Tested Environment

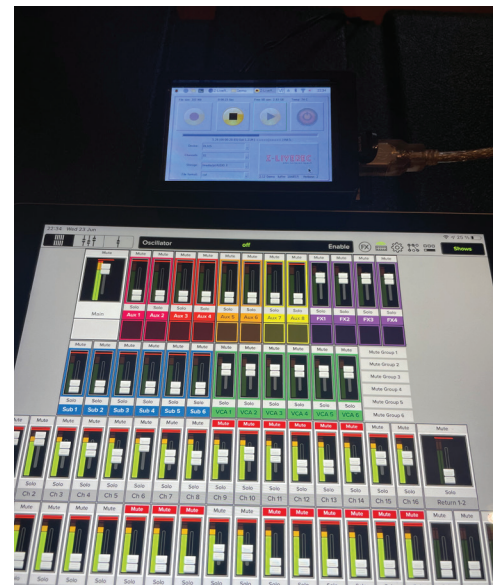
- Raspberry PI 3, 4, 2GB or more, PI 400, 4GB
- Raspbian GNU/Linux 10 Buster & Bullseye
- Raspberry PI OS 11 Bullseye 64 bit. (Separate version of Z-LiveRec)
- See our post - [how to build a multitrack recorder](#)

Tested audio devices

- Zoom U24 (2 Channels), Zoom H6 (6 Channels), Scarlett 4i4 Gen 3 (4 channels), Mackie DL-32S, DL32R (32 Channels), Mackie DL-16S (16 Channels), Behringer XR18 and Midas XR18.

Memory Cards

- SANDisk USB Ultra Fit 64GB USB 3.1 - 130 MB/s read / 55MB/s write, (Can generate bufferrn overruns in W64)
- SANDisk USB Extreme Go 64GB USB 3.2 - 395MB/s read/100MB/s write (Recommended)
- SSD Disks - please note most SSD disk requires external power



MOUNTING RASPBERRY PI 4 with a touchbased display.

Can be found and bought from [Ebay](#) -or [case](#) and [display](#) from Waveshare.com a special box with a 3.5" touch display for Raspberry PI 4 + instruction + display drivers.

- 3.5 inch Screen connect with SPI directly, also support HDMI screen display at same time.
- Physical resolution 320x480 with resistive touch control, can be directly connect Raspberry Pi 3 B+ and 4B

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Credits

The [Raspberry PI Forums](#), Mikael Svennungsson, Andreas Bilén, Kaj Grönlund, the great [Peter Dikant](#) and all lovely users of Z-LiveRec.

More information

<http://www.z-liverec.com>