Support for steering wheels is under heavy development. Consider this wiki page an early look. Join #steering-wheels on Discord to contribute or to follow latest updates.

Steering wheel controllers

If you've ever been to an arcade before, chances are you've seen or played on one of the sit-down driver cab games where the conventional steering wheel of a car is used to control a virtual car on-screen as opposed to a regular controller. From Batocera 🔧Fix Me! and up, steering wheel controllers are supported. Menu navigation is performed by 🔧Fix Me! and configuration on supported emulated systems is automatic.

Supported wheels

	Max range	FFB	Gear shifter	Notes
HORI Racing Wheel APEX	270°	✘	✘	Mapping is incomplete
HORI Racing Wheel Overdrive	270°	✘	✘	(v40) Must be on mode 2 to work
HORI Mario Kart Racing Wheel Pro Deluxe for Nintendo Switch	270°	✘	✘	(v42) Must be on DP switch mode
Logitech Driving Force	200°	✔	✘	
Logitech Driving Force GT	900°	✔	✔	
Logitech Driving Force Pro	900°	✔	✔	(v40)
Logitech Formula Vibration Feedback	180°	✘	✘	(v43)
Logitech G PRO Racing Wheel	None	✔	✘	(v42)
Logitech G25 Racing Wheel	900°	✔	✔	
Logitech G27 Racing Wheel	900°	✔	✔	
Logitech G29 Driving Force	900°	✔	✔	Must be on PS3/PC mode to work
Logitech G920 Driving Force (PlayStation model)	900°	✔	✔	
Logitech G920 Driving Force (Xbox model)	900°	✔	✔	(v41)
Logitech G923 Driving Force (PlayStation model)	900°	✔	✔	
Logitech G923 Driving Force (Xbox model)	900°	✔	✔	(v42)
Logitech Momo Racing	240°	✔	✔	
Microsoft SideWinder Force Feedback Wheel	220°	✔	✘	
Microsoft SideWinder Precision Racing Wheel	270°	✘	✘	(v41)
MOZA Racing R9	None	✔	✔	Mapping is incomplete
MOZA R12 V2 (Direct Drive)	None	✔	✔	(v43)
Speedlink 4in1 Leather Power Feedback Wheel (SL-6698)	250°	!	✘	(v42) FFB unsupported yet
ThrustMaster Ferrari 458 Spider	240°	✘	✘	FFB unsupported yet
Thrustmaster Ferrari Wireless F430 Cockpit	270°	✘	✘	

	Max range	FFB	Gear shifter	Notes
Thrustmaster Ferrari F430 Force Feedback	270°	✔	✘	
Thrustmaster Ferrari SF1000 (Advance Racer)	?	?	?	
Thrustmaster Ferrari GT 2 in 1 Rumble Force Racing Wheel	240°	✘	✘	(v40) Must be on 3-axis mode (default)
Thrustmaster T300 RS	1080°	✔	✘	
Thrustmaster T248	900°	✔	✘	(v42) Must update firmware to gain FFB. PC MODE only.
Thrustmaster T150 RS	1080°	✔	✔	(v40) Must be on PS3 mode to work
Thrustmaster T80	240°	✘	✘	(v40) Must be on gamepad mode to work
PXN-V10	900°	✔	✔	(v40) Must be on x-input mode, switch to 270° and FFB disabled in PXN phone app

Unsupported wheels

Wheel	Notes
Thrustmaster T128	Need testers, linux drivers are compatible (v41)
Thrustmaster TMX	Need testers, linux drivers are compatible (v41)
Mad Catz Wireless Racing Wheel for XBox 360	Unfortunately, seen as a plain XBox360 controller only

Supported systems (WIP)

System	Emulator	Working out of the box	Has FFB feature	Working FFB in Batocera	Notes
3DO	libretro:opera	✘	✘	—	3DO had one driving game with FFB
Atari 2600	libretro:stella	✘	✘	—	
Atari 5200	libretro:atari800	✘	✘	—	
Atomiswave	libretro:flycast	✔	✔	✘	
ColecoVision	libretro:bluemsx	✘	✘	—	No support in blueMSX yet
Dreamcast	libretro:flycast	✔	✘	—	
FBNeo	libretro:fbneo	✘	✘	✘	Not optimized
GameCube	Dolphin	✔	✔	✔	
Lindbergh	Lindbergh	✔	✔	✘	No FFB support yet
MAME	MAME	!	✔	✘	Not optimized
Model 2	model2emu	✘	✔	✔	Not optimized
Model 3	Supermodel	✘	✔	✔	Not optimized
Naomi	libretro:flycast	✔	✔	✘	
Naomi 2	libretro:flycast	✔	✔	✘	
Namco 2×6	Play!	✘	✔	?	Not optimized
Nintendo 64	Mupen64	✔	✘	—	

System	Emulator	Working out of the box	Has FFB feature	Working FFB in Batocera	Notes
Playstation	libretro:pcsx_rearmed	!	✘	—	Not optimized
Playstation 2	PCSX2	✔	✔	✔	
Playstation 3	RPCS3	✘	✔	✘	Not optimized
Sega Saturn	libretro:beetle-saturn	✔	✘	—	
Triforce	Dolphin	✘	?	—	
Wii	Dolphin	!	✘	—	Not optimized
Wiiu	cemu	✘	?	—	Not optimized
Xbox	xemu	!	?	—	Not optimized
Xbox 360	xenia	✘	?	—	Not optimized

Force feedback is supported with the PCSX2 and Dolphin (GameCube) emulators.

You can test the wheel force feedback from command line by (type `evtest` to find your XX value):
`ffcfstress -d /dev/input/eventXX`

Adding a wheel not yet supported by Batocera

Before trying to add a steering wheel you believe is not yet supported, verify the list above. If it's there but undetected in Batocera, upgrade to latest version.

If coming from an upgrade and the steering wheel is detected, but no buttons are working, simply delete the file `/userdata/system/configs/emulationstation/es_input.cfg` and reboot. This will generate a new `es_input.cfg` with the latest additions. **Do not remap the steering wheel,** this will break the pre-configured generator.

To initiate support for a new steering wheel controller in Batocera (view image below):

1. Configure the wheel as a normal pad in EmulationStation with the following convention:
   - **LEFT ANALOG LEFT** to the rotation of the steering wheel (skip **LEFT ANALOG UP** by holding any button)
   - If possible, **LEFT SHOULDER** and **RIGHT SHOULDER** to gear down and up respectively
   - **LEFT TRIGGER** to the brake pedal, and **RIGHT TRIGGER** to the acceleration/gas pedal
   - **START** as a button (required)
   - Additional buttons if possible, the more that can be assigned the more compatibility. For example: **D-PAD** and , , , (Fix Me! could probably follow a guideline similar to configure_a_controller)



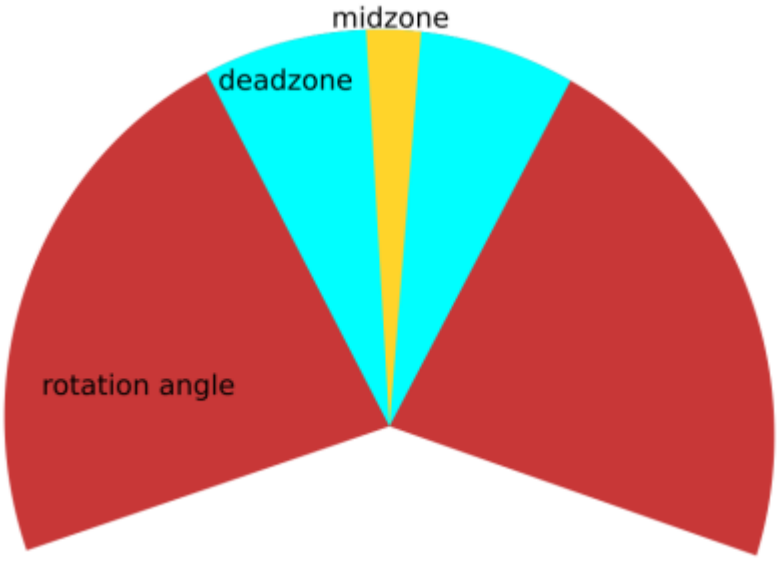
1. Create a file in `/userdata/system/udev/rules.d/` called `99-wheels.rules` (or any other name if you already have one) with the content below, replacing `my wheel name` by the actual wheel name, reported by the `evtest` command. Further more, you need to add the right rotation angle. If you have a direct drive model, you can skip the rotation angle value.

   99-wheels.rules

   ```
   SUBSYSTEM=="input", ATTRS{name}=="my wheel name", MODE="0666",
   ENV{ID_INPUT_JOYSTICK}="1", ENV{ID_INPUT_WHEEL}="1",
   ENV{WHEEL_ROTATION_ANGLE}="270"
   ```

2. Reboot. Your wheel should work. Some wheels require tweaking. Please contact the Batocera team via discord in case of any issue.
3. Don't forget to send the two files `/userdata/system/configs/emulationstation/es_last_input.cfg` and `99-wheels.rules` to the Batocera team so that the wheel becomes pre-configured for everybody in the next Batocera release.

Wheel zones



The wheel has three properties that can be adjusted (Fix Me! where?): rotation angle, midzone and deadzone.

Rotation angle

This will multiply the sent value by a factor to match the specified angle. This is the maximum rotation angle in degrees the wheel will respond to (in red on the picture). Most games would label this setting as “sensitivity”. If set to a value lower than the wheel's physical limits, it allows you to more easily reach the maximum input before turning the wheel all the way. It helps to convert a 900° rotation wheel to a 180° rotation wheel for example. Some games like Mario Kart 64 intended to play with a joystick need to switch very quickly from full left to full right which can be difficult to do on a 900° wheel without changing this setting.

If set to value higher than the wheel's physical limits, it will allow for more precise adjustment, however it will become physically impossible to reach the maximum input.

A common value is 180°. The value on the picture is around 225°.

Midzone

When the wheel is not being touched, it rests in the neutral position. While in this position, no input values should be being sent to the game. However, the wheel's sensor may become misaligned and start sending a turning signal even when in neutral position; the midzone is a small section near the middle where inputs will be ignored (hopefully meaning only actual turning actions are responded to).

A common value is 5°.

Reverse deadzone

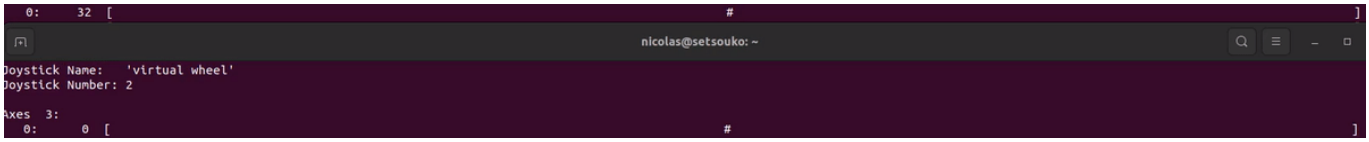
On real hardware, games made for consumer hardware would sometimes have a built-in deadzone in the game itself, meaning if small turning values are sent they will be ignored. This is common on home consoles such as the Nintendo 64. Unfortunately, this means the wheel (which is usually more accurate than a standard joystick) will feel very unresponsive as even after leaving its midzone, it will still be in the deadzone of the game itself. We can defeat the game's built-in deadzone by instantly snapping to a higher value after leaving the midzone instead; this is the “reverse deadzone”.

A common value is 45°.

Demonstration

On the following animated image, you can see:

- On the top, the real 270° wheel movement, from center, to maximum left, then to maximum right
- On the bottom, the wheel in game behavior.
  - In the midzone, the input sent is dramatically reduced.
  - When entering or exiting the midzone there is a jump caused by the reverse deadzone so the game properly reacts to the input.
  - The real wheel movement doesn't have impact on extremities (from 180° to 270°).
  - Configuration is: 180° maximum movement, 5° midzone and 25° deadzone.



Troubleshooting

My steering wheel is stuck to the left/right because of the feedback!

Try each of the following:

- Go to the in-game settings and calibrate.
- Turn off force feedback.
- Start a race and hit anything.

My calibrated steering wheel is not centered after launching a game

Turn the steering wheel to the left as far as it will go, then do the same to the right. This will update the maximum range read by the emulator.

I've launched a race in-game, but my wheel is not working! It works fine in its menus.

- Always check in-game settings if the controls are set to the steering wheel device and not the controller. Some games require the user to change it. You can save to memory card after that to keep the settings.

The game doesn't respond to any buttons on my steering wheel

- Some emulators use shifters to navigate and pedals to start or select. Some other games require a controller for menu navigation. Therefore, the steering wheel is limited to gameplay only.

Some games had no native steering wheel support. Therefore, playing those will be in controller-mode. Given that steering wheel support is still under development, controller-mode is not yet fully implemented and some games are simply unplayable without manual setup.

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