SM Switcher – User Manual

Introduction

The **SM Switcher** is a plugin specifically made for learning audio mastering. It offers an easy way to switch between two different audio sources with *automatic loudness matching*. This makes it possible to avoid *loudness bias* when comparing your master to the original mix.

Loudness bias is when you tend to perceive *louder* as *better* and makes it very difficult to make useful decisions when mastering. In our experience it is much easier to learn mastering when your feedback loop includes the *actual differences* without any loudness bias. That is the main purpose of this plugin.

The SM Switcher also has useful monitoring features like Mono, Solo Left/Right etc.

Prerequisites

The SM Switcher is currently **only available for macOS** and is supported from macOS Monterey 12.6.3 and upwards.

The plugin is in **VST3** and **AU** formats and should be usable in any DAW compatible with those plugin formats, but we have primarily developed and tested the plugin to be used in the **Monitoring FX** section of the **Reaper DAW**. All other uses are unsupported at the moment.

Installation

Close your DAW software, run the installer by double clicking the pkg-file in Finder, and follow the instructions.

Note that there is no registration or activation step before you can start using the plugin. We have decided to not put any effort into locking down the software to prevent piracy. We instead believe in pricing the plugin fairly and trusting that our users will support our effort by obtaining the software legally.

This allows us to focus on improving the actual features of the plugin instead of working on anti-piracy solutions that often make the user experience worse for honest people.

If you have obtained this plugin in any other way than buying a license from us, we urge you to do the right thing and either pay for a license or stop using it.

Where to place the SM Switcher plugin

The SM Switcher is primarily designed to be used for monitoring. You will normally not use the plugin for processing audio within the mix itself and it should not directly affect any exported or rendered audio.

The best place for the SM Switcher plugin is in the **Reaper Monitor FX chain**. This FX chain will only affect what you hear, but will not end up in any exports or renders. You could also place the plugin at other locations, but note that you may then need to disable the plugin before rendering or exporting.

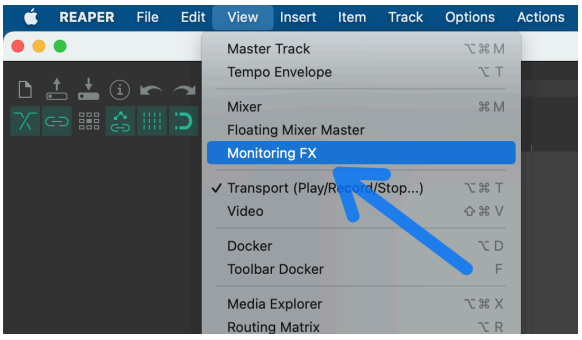
Other types of monitoring plugins are things like calibration plugins for speakers or headphones, or cross feed plugins for headphone monitoring. You will generally use the SM Switcher plugin in the same chain as any of those plugins.

Adding the plugin and routing the input signals in Reaper

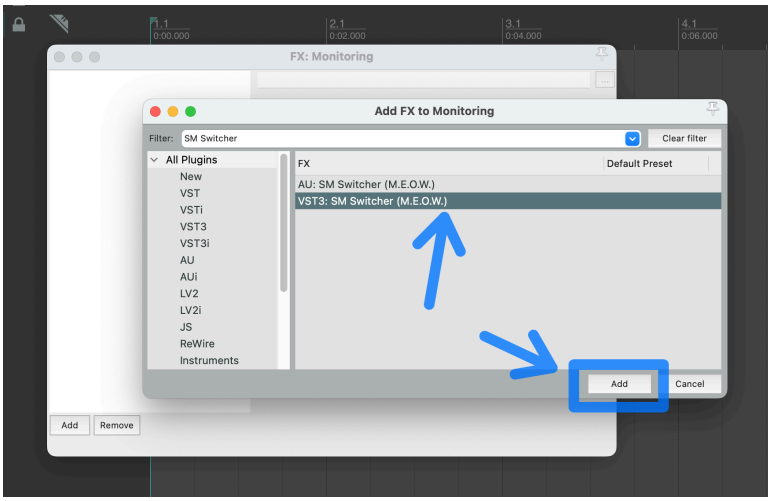
The goal with this section is to add the SM Switcher plugin to Reaper's Monitor FX chain, add two tracks in the arrange view, and route the output of the tracks to the two inputs of the SM Switcher plugin.

1. Add the Plugin to the Monitoring FX Chain

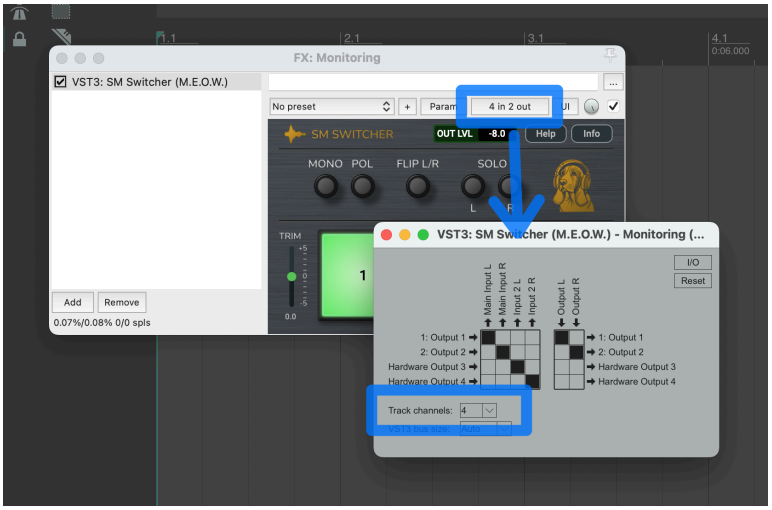
Open the Monitoring FX Chain from the top menu "View → Monitoring FX".



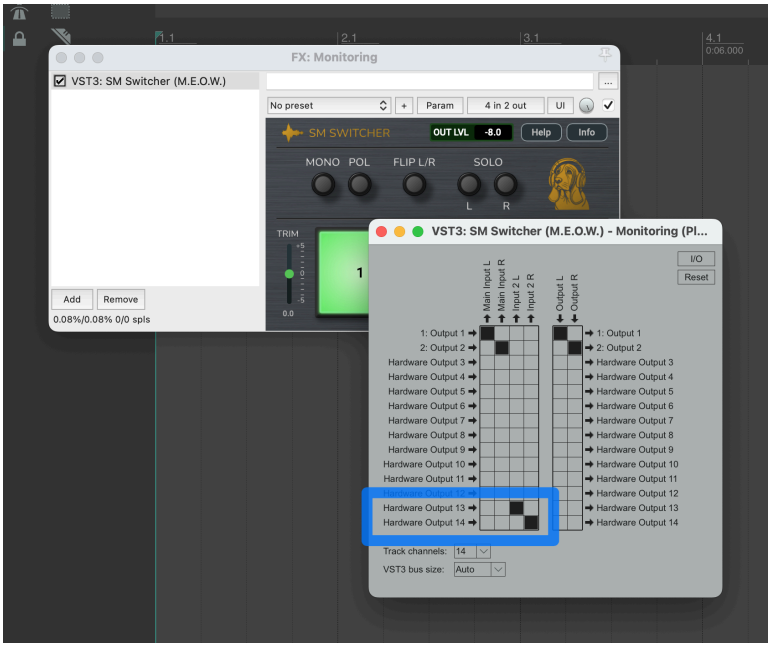
Add the SM Switcher to the plugin chain. If you have other monitoring plugins in the chain, make sure to add the SM Switcher *before* any speaker/headphone calibration or cross-feed plugins and *after* any measuring plugins, like LUFS meters or spectrum analyzers.



Open the Plugin pin connector window and make sure that “Track channels” is set to 4 or more. Note that in Reaper you can have up to 128 channels in the Monitoring FX chain, no matter how many outputs your audio interface actually has.



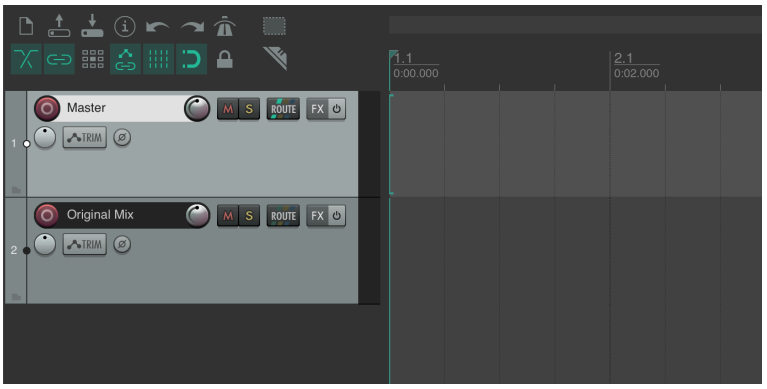
If your audio interface has more than two mono outputs, and you want to use the third and fourth output channels for other things, then you can route the signal via any other two channels. Remember what channels you chose here, you will need them soon.



2. Create and route tracks

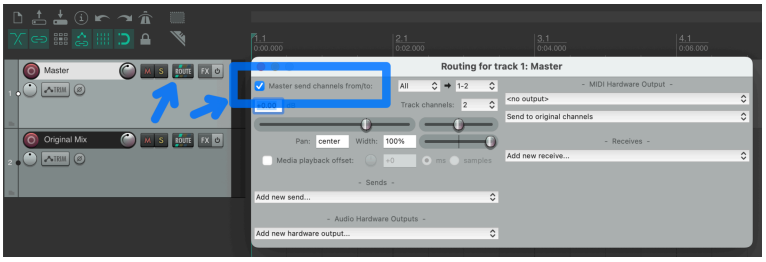
Create two tracks in your Reaper project. You can name them however you want, for example:

Track 1: Master
Track 2: Original Mix



Click the “Route” button on Track 1.

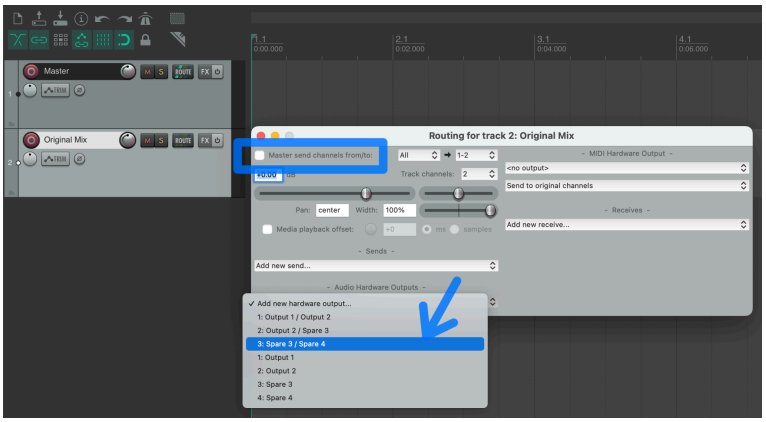
Ensure Master Send is enabled. This sends audio to Channels 1–2 by default, which go to Input 1 of the SM Switcher. Close the routing window.



Click the “Route” button on Track 2.

Disable "Master Send" (you don’t want it going to Inputs 1-2).

Under “Add new hardware output”, select "Spare 3 / Spare 4" (or Channels 3/4, depending on your system’s naming) OR select the same outputs as you chose earlier when you added the plugin to the Monitor FX chain. This sends the audio to Input 2 of the SM Switcher.



Now you have two tracks, routed to the two inputs of the SM Switcher. Place the audio items you want to listen to onto each of the tracks. You can for example work on your master on the top track and keep a copy of the original mix on the second. Then you can easily do loudness matched comparisons between the master and the mix using the big **1** and **2** buttons on the SM Switcher. Save the project as a template in order to quickly get started in the future.

Using the SM Switcher

The **ALM (Automated Loudness Matching)** is the core feature of the SM Switcher. It ensures that different audio sources, such as your master and original mix, can be compared at perceptually equal loudness levels. This allows for unbiased A/B listening, by pressing the big **1** and **2** buttons, without being misled by volume differences.

The short version of how to use the SM Switcher with ALM effectively is to follow these steps:

- Enable ALM.
- Select **Input 1** and press play.
- Give the ALM a few seconds to measure the loudness of the two inputs.
- Look at the ALM meter and adjust the trim level of Input 2 so that the yellow bars fall within the green area.
- Now you can switch between the two inputs and the loudness will automatically be matched.
- You may need to re-adjust the trim level if the yellow bars fall outside of the green area, which will then turn red. Follow the same procedure as above.
- If the yellow bars are out of reach when using the trim level of input 2 you can also adjust the trim level of input 1 to lessen the loudness difference. If the yellow bars still are out of range you will need to adjust the level at the source instead, i.e. tweak the levels before the signals reach the SM Switcher.

We recommend that you get to know the plugin by following the above steps. The next part of this manual will explain how the ALM works in more detail.

How it works – in more detail

The ALM operates in two stages:

- Manual loudness matching using the trim sliders
- Automated fine tuning via the ALM engine, within a ±3 dB range

The **ALM Meter** shows the difference in loudness between the two inputs. This meter will guide you into setting the correct manual trim levels and make sure that you get the optimal range for the automated loudness matching.

The **ALM Meter** has three short horizontal bars; two yellow bars on each side and one green bar in the centre.

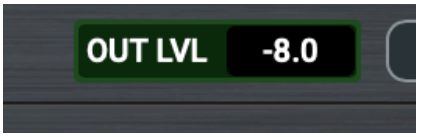
The yellow bars show the current loudness difference between the inputs. They basically show where the trim level needs to be set in order to match the loudness. The left yellow bar is based on a long-term measurement, and the right yellow bar is based on a short-term measurement.

The green bar in the middle shows the current gain applied to input 2, which is the sum of the manual trim level and the ALM gain. The ALM will try to compensate for the short-term loudness difference and can adjust the gain within ±3 dB. The available range is shown in the ALM meter as an area around the green bar.

The **ALM range area** can have different colors:

- The area is green while you are listening to Input 1 and the needed compensation gain is within the ALM range.
- The area is red while you are listening to Input 1 and the needed gain is outside of the ALM range. Adjust the trim levels to bring the yellow meters within the range.
- The area is dark yellow while you are listening to Input 2. Whenever you switch to Input 2 the automatic gain will freeze to the current value. This is to avoid that the level fluctuates while you are listening to Input 2. The loudness difference is still measured and visible via the yellow meters.
- The area is dark grey when playback is stopped.

Setting the Output Level



The compensation gain of the ALM together with the manual trims can result in peak levels above 0 dBFS after loudness matching. The border around the **Output Level** will flash red if the output signal exceeds 0 dBFS. In order to avoid clipping you can decrease the **Output Level**.

The default value for the **Output Level** is -8 dB, which creates 8 dB of headroom for the manual trim and Automatic Loudness Matching before there is any risk of clipping. This is usually enough, considering that there is up to +5 dB gain from the manual trim plus up to +3 dB of gain from the ALM, in total a maximum of +8 dB gain.

Note that lowering the **Output Level** makes the output of the plugin quieter than the input when enabled, so beware of this potential difference in loudness if you should bypass the plugin.

Stereo monitoring features

Mono and Pol

Mono sums the left and right channel so you can listen to the mono signal. **Pol** flips the polarity of the right channel and makes the signal appear “out-of-phase”. This can sometimes be good for troubleshooting, but it is most useful together with the **Mono** button since pressing both of them will let you hear the Side (Difference) signal.

Flip L/R

Flips the stereo image, i.e. lets left and right trade places. Makes it super easy to check if the stereo image is tilting to the left or right.

Solo L/R

Solos the left and right channels respectively. Use it together with the **Mono** button to quickly hear any tonal differences between the left and right channel.

Help and info

Press the **Help** button to enable helpful tooltips for most controls.

Press the **Info** button to see more information about the plugin.

END-USER LICENSE AGREEMENT (EULA) FOR SM SWITCHER

This End-User License Agreement ("EULA") is a legal agreement between you (either an individual or a single entity) and Stockholm Mastering AB ("Licensor") for the SM Switcher plugin ("Software"). By installing, copying, or otherwise using the Software, you agree to be bound by the terms of this EULA.

SAFETY WARNING

The Software is capable of generating high-volume audio output. Prolonged exposure to excessive sound levels can cause permanent hearing damage. Users are advised to monitor and control audio levels during use and to consult appropriate guidelines for safe listening practices. Licensor is not responsible for any hearing loss or other injuries resulting from improper use of the Software.

PURPOSE OF USE

This software is intended primarily for educational, experimental, and personal use. It is not designed, licensed, or warranted for professional, commercial, or critical production environments. Users acknowledge that reliance on this software for professional audio production is at their own risk.

1. GRANT OF LICENSE

Licensor hereby grants you a non-exclusive, non-transferable license to install and use the Software on up to 3 devices owned by you, subject to the terms and conditions of this EULA.

2. LICENSE RESTRICTIONS

You may not:

- Reverse engineer, decompile, disassemble, or create derivative works based on the Software, except and only to the extent that such activity is expressly permitted by applicable law notwithstanding this limitation.
- Rent, lease, lend, sell, sublicense, distribute, or otherwise transfer the Software to any third party without the prior written consent of Licensor.
- Modify, adapt, or tamper with the Software, including any related components or documentation.
- Use the Software for any illegal or unauthorized purpose.

3. OWNERSHIP AND INTELLECTUAL PROPERTY

The Software is the exclusive property of Licensor, and all intellectual property rights, including but not limited to copyrights, patents, trademarks, and trade secrets, are retained by Licensor. This EULA does not grant you any ownership interest in the Software.

4. SOFTWARE UPDATES

Licensor may, at its discretion, provide updates, upgrades, or enhancements to the Software. Such updates may be provided free of charge or as a paid upgrade, depending on the nature of the update. It is the User’s responsibility to ensure they are using the latest version of the Software to maintain compatibility, security, and optimal performance. Licensor is not liable for any issues, damages, or losses arising from the use of outdated versions of the Software. Your use of any such update is governed by this EULA unless separate terms are provided with the update.

5. SUPPORT

Licensor offers technical support for the Software via email, subject to the availability and policies of Licensor. Support is provided on an "as-is" basis, and Licensor makes no guarantees regarding the response time or resolution of support requests.

6. TERMINATION

This EULA is effective until terminated. Your rights under this license will terminate automatically without notice from Licensor if you fail to comply with any term(s) of this EULA. Upon termination, you must cease all use of the Software and destroy all copies, full or partial, of the Software.

7. DISCLAIMER OF WARRANTIES

The Software is provided "as is" without warranty of any kind, either express or implied, including, but not limited to, the implied warranties of merchantability, fitness for a particular purpose, or non-infringement. Licensor does not warrant that the Software will meet your requirements or that the operation of the Software will be uninterrupted or error-free.

8. LIMITATION OF LIABILITY

In no event shall Licensor be liable for any special, incidental, indirect, or consequential damages whatsoever (including, but not limited to, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of the use of or inability to use the Software, even if Licensor has been advised of the possibility of such damages.

To the maximum extent permitted by applicable law, Licensor shall not be liable for any personal injury, including but not limited to hearing loss, physical discomfort, or any health-related issues arising from the use or misuse of the Software, including prolonged exposure to high volume levels or settings. The User acknowledges that they are solely responsible for ensuring safe usage and monitoring audio output levels.

9. GOVERNING LAW

This EULA will be governed by and construed in accordance with the laws of Sweden, without regard to its conflict of law principles. Any legal action or proceeding arising under this EULA will be brought exclusively in the courts located in Sweden, and the parties hereby consent to such jurisdiction and venue.

10. SEVERABILITY

If any provision of this EULA is held to be unenforceable, such provision shall be modified to the extent necessary to make it enforceable, or eliminated, and the remainder of this EULA shall continue in full force and effect.

11. ENTIRE AGREEMENT

This EULA constitutes the entire agreement between you and Licensor concerning the Software and supersedes any prior or contemporaneous agreements, understandings, or communications, whether written or oral, relating to the subject matter hereof.

12. THIRD-PARTY COMPONENTS:

This product includes the following third-party component:

- Ebu128LoudnessMeter by Samuel Gaehwiler from Klangfreund

Ebu128LoudnessMeter is licensed under the MIT License.
The full license text is provided below.

The MIT License (MIT)

Copyright (c) 2011-2018 Klangfreund Samuel Gaehwiler

Permission is hereby granted, free of charge, to any person obtaining a copy of
this software and associated documentation files (the "Software"), to deal in
the Software without restriction, including without limitation the rights to
use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies
of the Software, and to permit persons to whom the Software is furnished to do
so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all
copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR
IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY,
FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE
AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER
LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM,
OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE
SOFTWARE.
---

13. ACKNOWLEDGMENT

By installing or using the Software, you acknowledge that you have read this EULA, understand it, and agree to be bound by its terms and conditions.