USER MANUAL

_MINIFUSE 2

ARTURIA

_The sound explorers

Special Thanks

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Thank you for purchasing the Arturia MiniFuse 2!

This manual covers the features and operation of Arturia's **MiniFuse 2**. MiniFuse 2 is a professional-grade audio interface that empowers the recording and production of music and audio content. Whether in the studio, on the road, or at home, we are confident that the MiniFuse 2 will become an indispensable tool in your kit.

Be sure to register your MiniFuse 2 as soon as possible! There is a sticker on the bottom panel that contains the serial number of your unit and an unlock code. These are required during the online registration process at www.arturia.com. You may want to record these elsewhere or take a photo of the sticker in case it becomes damaged.

Registering your MiniFuse 2 provides the following benefits:

- Access to the latest version of the Arturia Software Center and MiniFuse Control Center applications
- Special offers restricted to MiniFuse owners

As a registered owner, you also have access to an exclusive software bundle that includes:

- Arturia's Pre 1973, Rev PLATE-140, Delay TAPE-201, Chorus JUN-6 audio effects
- Arturia's Analog Lab Intro containing thousands of ready-to-use instruments and sounds
- Ableton Live Lite
- NI Guitar Rig 6 LE
- 3-month complimentary subscription to Splice
- 3-month complimentary subscription to Auto-Tune Unlimited
- Exclusive Ableton Live Lite sessions curated by producers around the globe

MiniFuse 2 is easy to use, so you'll probably start experimenting with it right out of the box. However, please be sure to read this manual even if you are an experienced user, as we describe many useful tips that will help you get the most out of your purchase. We're sure you will find MiniFuse 2 a powerful tool in your setup and we hope you'll use it to its fullest potential.

Happy music making!

The Arturia team

Special Message Section

Specifications Subject to Change:

The information contained in this manual is believed to be correct at the time of printing. However, Arturia reserves the right to change or modify any of the specifications without notice or obligation to update the hardware that has been purchased.

IMPORTANT:

The product and its software, when used in combination with an amplifier, headphones or speakers, may be able to produce sound levels that could cause permanent hearing loss. DO NOT operate for long periods of time at a high level or at a level that is uncomfortable.

If you encounter any hearing loss or ringing in the ears, you should consult an audiologist.

NOTICE:

Service charges incurred due to a lack of knowledge relating to how a function or feature works (when the product is operating as designed) are not covered by the manufacturer's warranty, and are therefore the owner's responsibility. Please study this manual carefully and consult your dealer before requesting service.

Precautions include, but are not limited to, the following:

1. Read and understand all the instructions.
2. Always follow the instructions on the device.
3. Before cleaning the device, always remove the USB cable. When cleaning, use a soft and dry cloth. Do not use gasoline, alcohol, acetone, turpentine or any other organic solutions; do not use a liquid cleaner, spray or cloth that is too wet.
4. Do not use the device near water or moisture, such as a bathtub, sink, swimming pool or similar place.
5. Do not place the device in an unstable position where it might accidentally fall over.
6. Do not place heavy objects on the device. Do not block openings or vents of the device; these locations are used for air circulation to prevent the device from overheating. Do not place the device near a heat vent at any location with poor air circulation.
7. Do not open or insert anything into the device that may cause a fire or electrical shock.
8. Do not spill any kind of liquid onto the device.
9. Always take the device to a qualified service center. You will invalidate your warranty if you open and remove the cover, and improper assembly may cause electrical shock or other malfunctions.
10. Do not use the device with thunder and lightning present; otherwise it may cause long distance electrical shock.
11. Do not expose the device to hot sunlight.
12. Do not use the device when there is a gas leak nearby.
13. Arturia is not responsible for any damage or data loss caused by improper operation of the device.

Table Of Contents

1. INTRODUCTION

Thank you for purchasing our compact audio interface, the MiniFuse 2. We at Arturia are committed to delivering excellent products that satisfy the needs of modern musicians and producers - we are confident that the MiniFuse 2 will be a perfect companion to any computer-based music production and recording setup.

1.1. WHAT IS AN AUDIO INTERFACE AND WHY DO I NEED ONE?

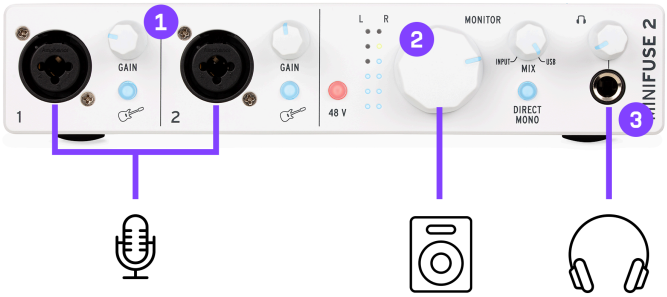
An audio interface is an outboard device that handles processing of audio input and output. While all laptop and desktop computers these days come equipped with integrated soundcards, in practice these are only meant for casual use and are, in most cases, insufficient for the demanding tasks of audio production and recording. Our MiniFuse 2 is an affordable, professional-grade dedicated audio interface that offers the following advantages over a typical onboard soundcard:

- Optimized for low-latency performance
- Microphone preamp(s) for crisp, present recording of vocals and instruments
- High-impedance input(s) to directly record your guitar or bass.
- Headphone and speaker system outputs for flexible monitoring
- Loopback recording for recording computer audio without any messy hardware or software configurations.
- Direct Monitoring for monitoring your performance without any processing latency.

1.2. MINIFUSE 2 FEATURES OVERVIEW

- 2 x combo Mic/Inst/Line XLR inputs with optional 48V phantom power
- 2 x 1/4" TRS balanced line outputs
- 1 x 1/4" stereo headphone output
- 1 x 5-pin MIDI input
- 1 x 5-pin MIDI output
- 1 x USB2 type A hub (low power)
- USB-C interface compatible with PC, Mac, fully USB 2.0 compatible
- Bus-powered
- Up to 192kHZ / 24bits
- Loopback stereo input (at all sample rates)

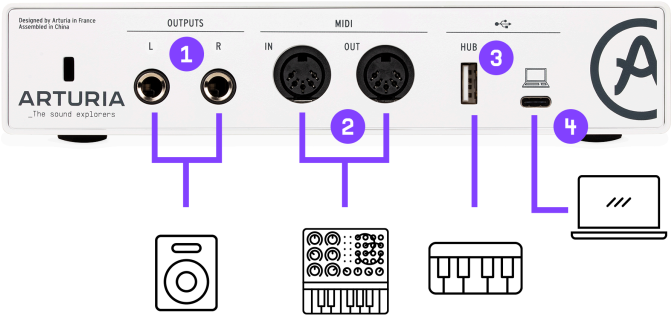
2. CONNECTION DIAGRAM



1 : XLR/TRS combo inputs for microphones, guitars/basses or other instruments

2 : Monitor Volume knob

3 : Headphones output



1 : TRS outputs to connect powered speakers or mixers/amplifiers

2 : MIDI input/output to control a synthesizer, drum machine or some other Midi device

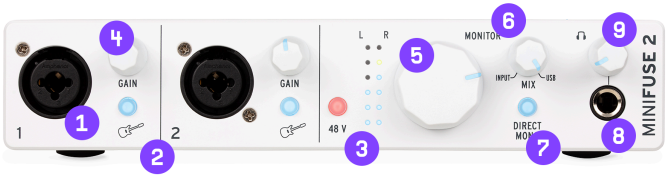
3 : USB hub port allowing connection of thumb drives, controllers or other USB devices requiring less than 250mA

4 : Connection to the computer

> Note: We strongly recommend using the included cable with your interface when connecting your device to a computer to avoid any connectivity issues. The included USB cable has been specially designed for the Arturia MiniFuse 2.

3. FRONT PANEL FEATURES

The front panel of the MiniFuse 2 provides access to most of the essential features on the unit.



1. The **combo jack(s)** accept two different kinds of input - XLR and TRS - allowing you to connect a variety of microphones and instruments into the MiniFuse. The type of input is determined by the Guitar and 48V switches next to the input.

2. The **Inst switch** toggles the high-impedance circuit for the corresponding input.

> When recording instruments with pickups, like guitar and bass, using the high-impedance setting adjusts the internal circuit so that you can plug the instrument directly into the input without having to first plug into an amp or a direct box. When using other types of inputs, like synthesizers or microphones, leave this switch in the inactive position.

3. **48V switch** turns on phantom power for the input(s). Phantom power delivers a power current to a connected microphone and may be required to get a good signal out of certain types of microphones. Please read the following recommendations regarding when and how to use phantom power:

> Only certain types of microphones, like condenser microphones, require phantom power to function properly. Please check your microphone's user manual to determine which type it is. Phantom power may damage some equipment, like certain ribbon microphones. Ensure that you are only using phantom power with microphones that require it. Do not connect or disconnect microphones while phantom power is turned on. Turn off phantom power first, then connect or disconnect the microphone.

4. The **Gain knob** controls the gain of the input preamp. Use it to adjust the volume of the input to ensure that you are capturing a good signal without overloading. The knob also features a LED indicator to help with setting input gain. When an instrument or microphone source is detected, the LED will illuminate blue. If the input signal overloads, the LED will illuminate red. If this happens, turn down the Gain knob.

> High-resolution input metering is available through the MiniFuse Control Center [p.19] application.

5. **Monitor Volume knob** controls the volume of the signal sent to the speakers (outputs L & R on the rear panel).

6. **Monitor Mix knob** controls the mix of direct input signal (Direct Monitoring) and computer audio playback. Its default position is Fully Clockwise. At minimum position, you will only hear signal from the interface input(s). As you turn up the knob, you will gradually crossfade to computer playback. At maximum position, you will only hear computer playback.

> Recording live instruments on a computer can sometimes present challenges, depending on your computer configuration and CPU load. Since your computer processes incoming and outgoing audio in buffer "chunks", this can result in delayed playback of the input signal, which can create distracting echoes that could throw off a performance. Instead of monitoring the input signal through software, the MiniFuse 2 gives you the option of using Direct Monitoring. Direct Monitoring sends the input signal(s) directly to the outputs, allowing you to listen to the input(s) directly without any latency introduced by computer processing. To read more about latency and how to best deal with it, please see the A Quick Primer On Digital Audio [p.31] section of this manual.

7. **Direct Mono switch** controls how the input signals are distributed across the stereo output when using Direct Monitoring. In the inactive position, input 1 is sent to the left channel (output 1) while input 2 is sent to the right channel (output 2). In the active position, inputs 1 and 2 are turned into mono signals that are sent to both channels; effectively this means that both inputs will play back centered in the stereo image instead of panned to one speaker or the other.

> The Direct Mono switch only impacts how signal from the inputs is routed to the speakers and headphones. It does not have any effect on the stereo image of computer playback.

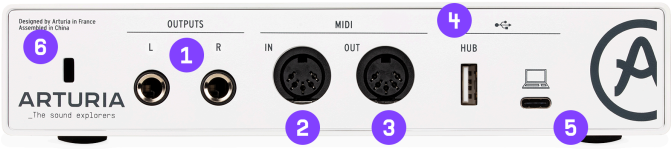
8. The 1/4" stereo **headphone output** can be used for connecting headphones. The headphone output mirrors the Monitor Output but has its own independent volume control.

9. Headphone Volume adjusts the volume of the headphone output.

> Listening to loud music for prolonged durations of time through headphones can have a negative impact on your hearing. When using headphones, we recommend taking frequent breaks to give your ears a rest and avoiding high volumes for prolonged durations.

4. REAR PANEL FEATURES

The rear panel of the MiniFuse 2 provides access to audio and MIDI connections.



1. Outputs - these 1/4" balanced stereo outputs can be connected directly to active studio speakers or other devices such as amplifiers and mixers.

2. MIDI In - connect MIDI devices to this jack using a standard 5-pin MIDI cable. Devices connected to this input can be used to trigger and control software instruments and effects.

3. MIDI Out - this output allows you to output MIDI data from your computer to control other MIDI-compatible hardware devices.

4. Hub - this convenient USB port allows you to plug in other USB devices, like thumb drives or MIDI controllers.

> While the Hub port is sufficient for powering most controllers and portable drives up to 250mA, it may not provide enough power for some devices that require higher power draw. In these situations, we recommend plugging these devices directly into your computer, or into a separate powered USB hub.

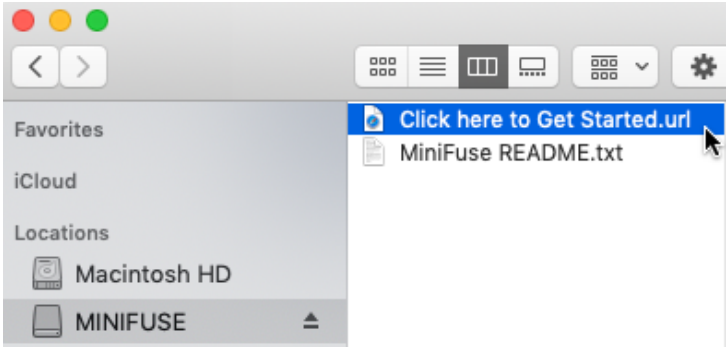
5. USB - connect the interface to your computer by plugging the supplied USB cable into this port and your computer. This connection provides power to the interface and enables communication between the interface and your computer.

6. Kensington lock - this optional security slot can be used for securing the interface using a Kensington lock cable.

5. SETUP

The first time you connect the MiniFuse 2 to your computer, it will appear as an external disk drive.

Open the drive to access its contents, and double-click the **Click here to Get Started** link.



This link will open the MiniFuse registration page in your web browser. Follow the instructions there to register your unit and download the MiniFuse Control Center application.

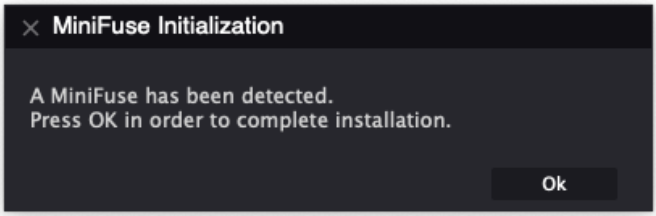
Benefits of registering:

- Free exclusive effects and instruments from Arturia, Ableton, and many more
- Access to tutorials, sound banks, and helpful content to get you started
- Regular free firmware updates
- Exclusive discounts on Arturia products as a registered user

> While it is possible to use the MiniFuse 2 immediately without the MiniFuse Control Center application, we highly recommend following the steps outlined in this section to initialize your MiniFuse 2 so that you can take advantage of all of its features. The MiniFuse Control Center installer includes the MiniFuse ASIO driver for Windows, enabling the best performances from your MiniFuse.

Once you have downloaded and installed the **MiniFuse Control Center** application, double-click to start it.

You will see the following pop-up window. Press **OK** to complete the installation.



Congratulations, your MiniFuse 2 is now ready to use! For more information and support online, you may visit www.arturia.com/support.

For more information on the features available in the MiniFuse Control Center application, see the MiniFuse Control Center [p.19] section of this manual.

5.1. Changing default system audio input and output

If you would like to use the MiniFuse 2 as your computer's default audio playback and recording device, follow the instructions below.

> Most pro audio applications have their own audio preferences where you can select the MiniFuse 2 as the active audio device. If you intend to only use the MiniFuse for playback and recording with these applications, it is not necessary to change the default system audio input and output.

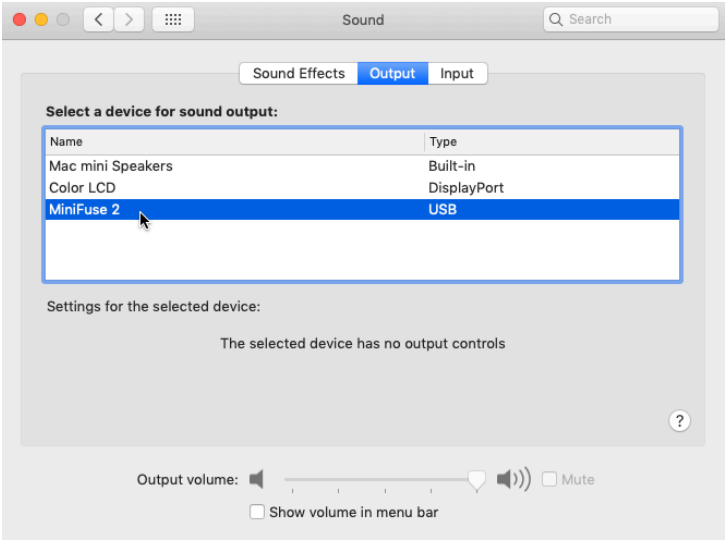
5.1.1. macOS

1. Navigate to your **Applications** folder.

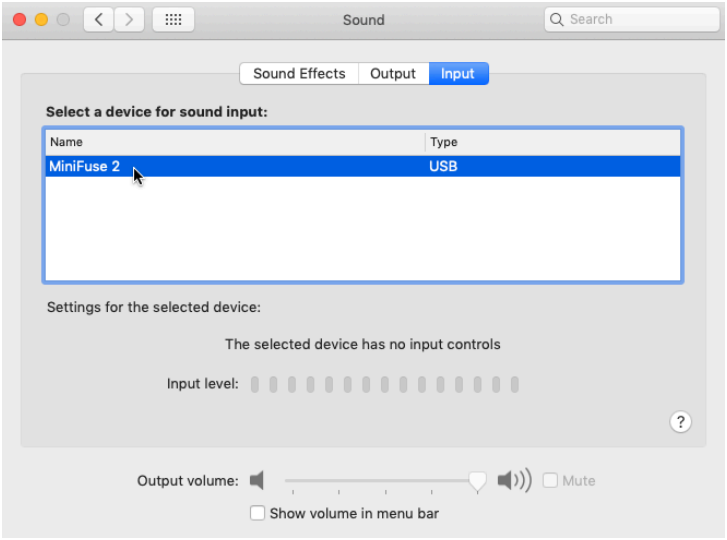
2. Double-click **System Preferences**.

3. Click the **Sound** icon.

4. If you would like all computer audio - such as audio from browsers and movie players - to be played back through the MiniFuse 2, click the **Output** tab and select the MiniFuse as the default output device.

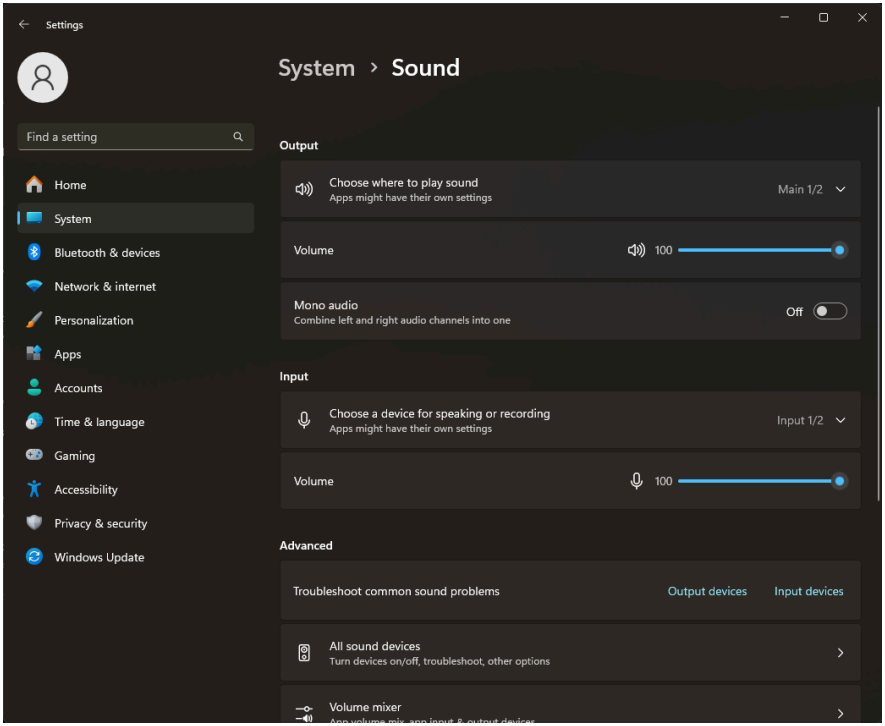


5. If you would like to use a microphone connected to the MiniFuse 2 as the default sound input into your computer, click the **Input** tab and select the MiniFuse as the default input device.



5.1.2. Windows

1. Navigate to **Settings**.
2. Click the **Sound** tab.
3. If you would like all computer audio - such as audio from browsers and movie players - to be played back through the MiniFuse 2, choose 'MAIN Left/Right (MiniFuse 2) from the **Output** menu.
4. If you would like to use a microphone connected to the MiniFuse 2 as the default sound input into your computer, choose the input channel from the **Input** menu.



5.2. Using the MiniFuse 2 as an audio device with your DAW

Most audio applications have their own audio settings, where you can select the active audio device. Here we will show you how to configure the MiniFuse 2 with several audio applications. The process will be similar in other audio applications.

> Core Audio is a native Mac audio protocol. All audio devices are built on top of this framework. Windows contains several available audio protocols. ASIO is optimized for low latency and high fidelity. We recommend using the ASIO driver provided by Arturia for best results.

Regardless of which application you use, there will be several additional important controls in the audio preferences:

- **Buffer Size** determines how quickly the computer will process audio data - the smaller the buffer size the faster it will process audio, resulting in less latency at the expense of higher CPU usage.
- **Sample Rate** specifies the sampling rate at which the MiniFuse 2 converts audio. CD quality sample rate is 44,1OOHz.

For more information on buffer size, sample rate, and their impact on latency, see the A Quick Primer On Digital Audio [p.31] section of this manual.

5.2.1. Configuring audio in Ableton Live

In Ableton Live, go to the Live menu and click **Preferences**.

In the Preferences window, click the **Audio** tab to access the audio device settings.

Select CoreAudio (MacOS) or ASIO (Windows) in the **Driver Type** menu.

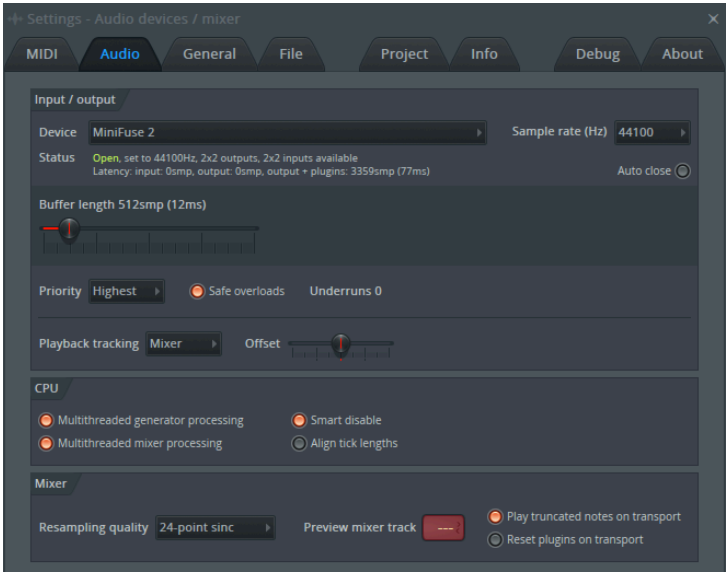
Select the MiniFuse 2 in the **Audio Input Device** and **Audio Output Device** menus.

If you need to enable or disable specific input or output channels, you can click the **Input Config** or **Output Config** buttons.

5.2.2. Configuring audio in FL Studio

In FL Studio, click the **Options** menu, then click **Audio Settings**.

In the **Device** menu select the MiniFuse.



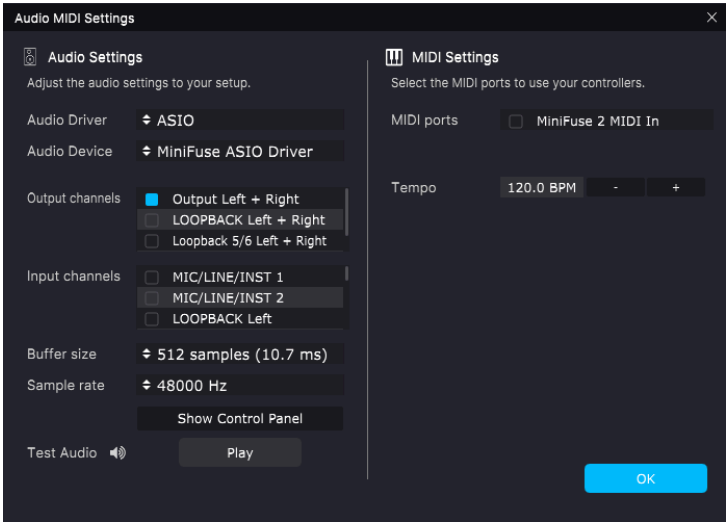
5.2.3. Configuring audio in Analog Lab

Our own Analog Lab software can work in standalone or plug-in mode. When using the standalone application, follow these steps to configure it for use with the MiniFuse 2:

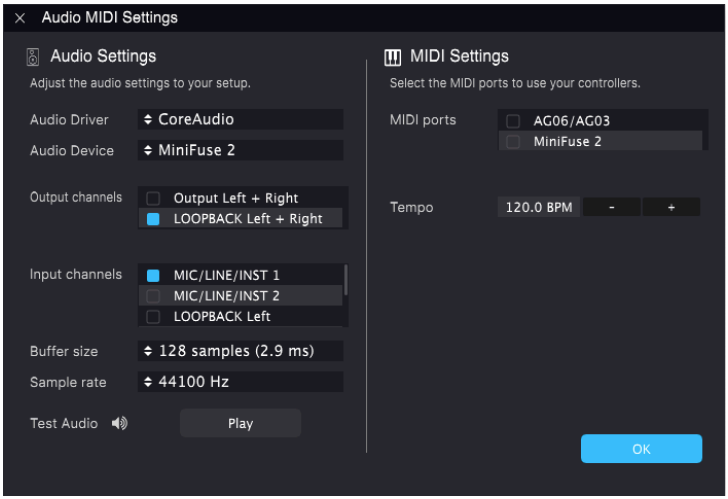
In Analog Lab, click the Menu button at the top left (three horizontal lines), then click **Audio MIDI Settings**.

In the Audio MIDI Settings window, select CoreAudio (MacOS) or ASIO (Windows) in the **Device** section.

In the menu below, select the **MiniFuse 2**.



Audio preferences on Windows



Audio preferences on macOS

In the **Output Channels** section select Output Left + Right; this is the main speaker output from the MiniFuse.

You can press the **Play** button in the Test Tone section - you should hear a short tone played back through the MiniFuse 2.

For more tips and in-depth information on how to configure various DAWs, please be sure to visit the MiniFuse FAQ.

5.3. Recording audio into your DAW

Once your DAW has been configured to use the MiniFuse 2 as an input audio device, create a new audio track where you would like to record your performance. Here we will show the process in Ableton Live. It will be similar in other applications.

In the **Audio From** menu, select External Input.

In the menu below, select the input channel where you have connected the instrument or microphone you would like to record.

If you would like to record a stereo sound source, like a synthesizer or drum machine, select a stereo pair from the menu.

Press the **Record Arm** button on the track - you should now hear the audio input played back through the computer.

If you do not wish to hear the input, you can turn off the Track Activator button, or change the Monitor setting to Off.

Next, press the **Record** button in your DAW's transport and it will begin playing back the arrangement and recording onto this track.

5.4. Using the MiniFuse 2 as a MIDI device with your DAW

The MiniFuse 2 features standard 5-pin MIDI input and output ports on the rear panel that can be used to connect MIDI-compatible devices to your computer.

While most MIDI controllers nowadays come with direct MIDI-over-USB connectivity, there are devices like synthesizers and drum machines that only feature standard 5-pin MIDI input and output ports. These devices can be connected to your computer and integrated into your workflow through the MiniFuse.

IMPORTANT: Note that MIDI input and output will only work once the MiniFuse Control Center is installed on the computer. You can access the MiniFuse Control Center installation by clicking the MiniFuse in your Finder / Explorer and visiting the link contained inside.

You may need to enable these MIDI ports in your DAW to be able to use them. Here we will show you how to do this in several audio applications. The process will be similar in other audio applications.

5.4.1. Configuring MIDI in Ableton Live

In Ableton Live, go to the Live menu and click **Preferences**.

In the Preferences window, click the **Link MIDI** tab to access the MIDI device settings.

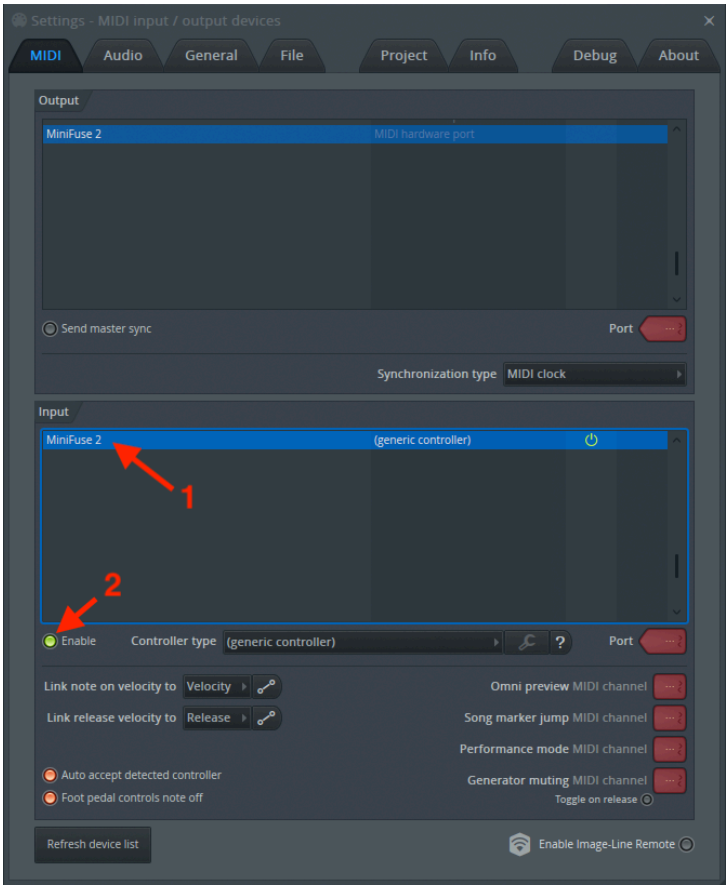
The MiniFuse 2 should be listed in the MIDI ports section.

- To receive MIDI notes from the MIDI IN port on the MiniFuse 2, enable the Track input.
- To transmit MIDI notes to the MIDI OUT port on the MiniFuse 2, enable the Track output.
- To receive continuous control (CC) data from the MIDI IN port on the MiniFuse 2, enable Remote input.

- To transmit continuous control (CC) data to the MIDI OUT port on the MiniFuse 2, enable Remote output.

5.4.2. Configuring MIDI in FL Studio

In FL Studio, select the MiniFuse 2, then click the **Enable** button. You should now receive MIDI signal from the MiniFuse into your DAW

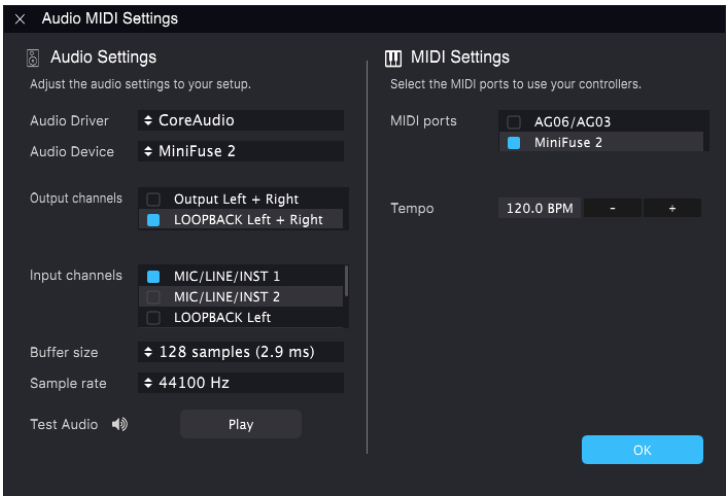


5.4.3. Configuring MIDI in Analog Lab

When using our Analog Lab software in standalone mode, you will need to enable the MIDI ports you want to use:

In Analog Lab, click the Menu button at the top left (three horizontal lines), then click **Audio MIDI Settings**.

In the **MIDI Devices menu**, enable MiniFuse 2. You should now receive MIDI signal in Analog Lab.

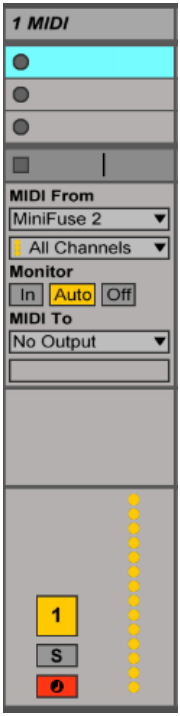


5.5. Recording MIDI from the MiniFuse 2 into your DAW

Once the MiniFuse 2 has been configured as a MIDI device in your DAW's settings, create a new Instrument (MIDI) track.

Place a software instrument like a synthesizer or drum machine on this track.

In the **MIDI From** menu select the MiniFuse 2, or you can leave this menu to **All Ins** to receive MIDI from all connected devices, including the MiniFuse.



Click the channel's **Record Arm** button. Now when you adjust controls or press pads or keys on your connected MIDI device, you should see the MIDI activity bar light up to indicate that this channel is receiving MIDI. Depending on the software device loaded onto the channel, you should also hear sound being produced from it.

Next, press the **Record** button in your DAW's transport and it will begin recording your MIDI performance onto this track.

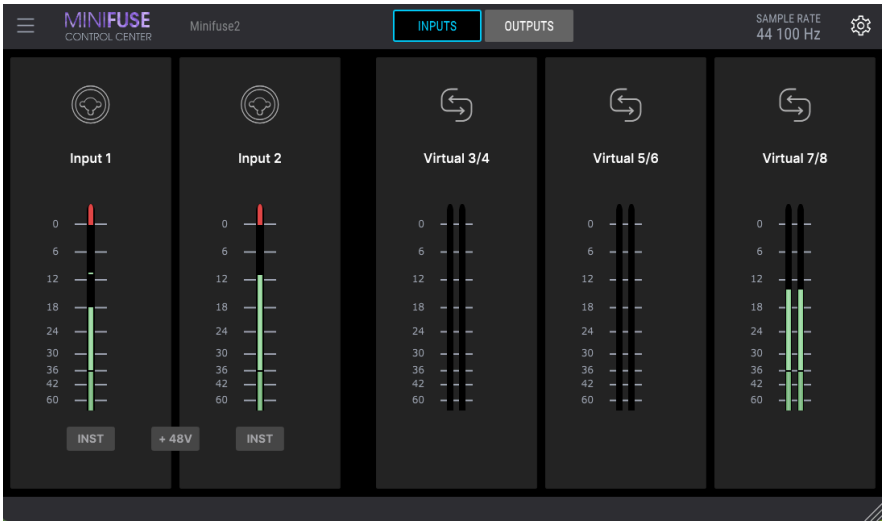
6. MINIFUSE CONTROL CENTER

Your MiniFuse comes with **MiniFuse Control Center**, a convenient application that makes it easy to access its features directly from your computer.

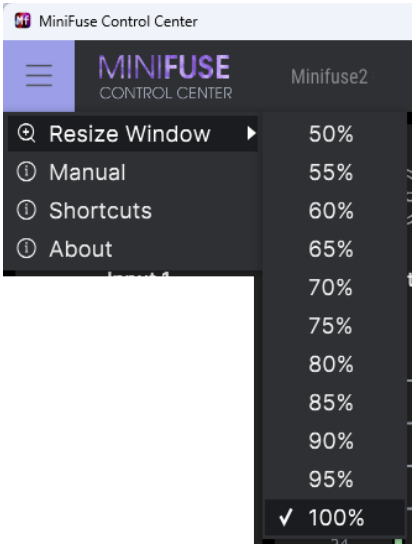
The application can be found in:

- Mac: Applications\Arturia\MiniFuse Control Center
- Windows: C:\Program Files (x86)\Arturia\MiniFuse Control Center

> The Mac and Windows versions of MiniFuse Control Center differ somewhat in their feature sets, but have many features in common. The illustrations below, unless indicated otherwise, are from the Windows version.

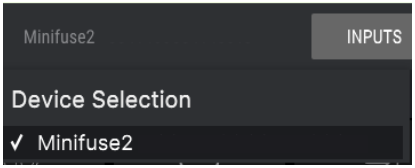


6.1. Top Toolbar

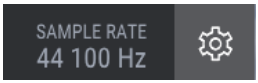


Clicking on the Main Menu icon in the upper left corner provides access to:

- **Resize Window** adjusts the size of the application for optimal viewing.
- **Manual** opens this user manual.
- **Shortcuts** pops up a window with some useful keyboard shortcuts.
- **About** displays the software version and other information.



To the right of the application logo you can access **Device Selection**. If you have only one MiniFuse, its serial number will be displayed. If you have more than one unit hooked up, the drop-down menu will list each one, and you can select one to access its settings.



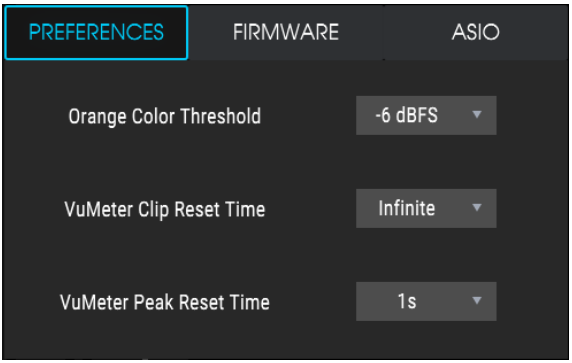
Sample Rate displays the currently selected sample rate.

> Sample Rate can be changed in your host application or computer settings.

The **Gear** button in the upper right display opens the Settings window.

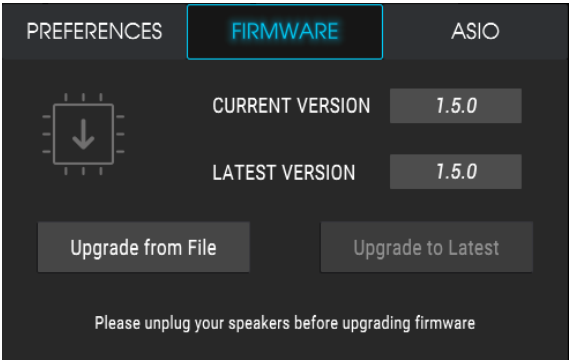
6.2. Settings Window

The Settings window contains parameter settings that you will usually set once and leave as they are. It has three tabs:



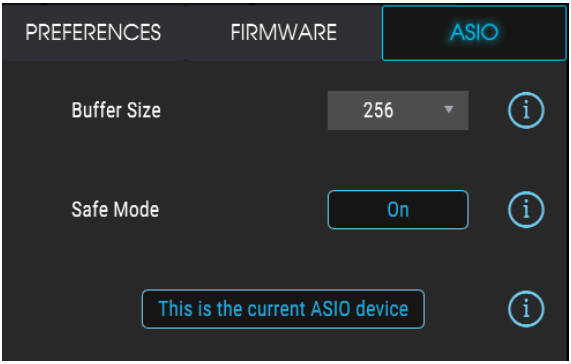
The **Preferences** tab is where you can set some elements of the level meters' behavior.

- **Orange Color Threshold** is the level where the meter color turns from green to orange.
- **VuMeter Clip Reset Time** is how long it takes before the meter turns off the red clipping indicator. Time values can be 1.5 seconds, 3 seconds, or Infinite (the clip indicators remain lit until clicked).
- **VuMeter Peak Reset Time** is how long it takes before the meter resets the orange line that indicates the highest recent peak level. Time values can be None, 1 through 5 seconds, or Infinite (the peak indicator line remains lit, until it's replaced by a higher peak level).



The **Firmware** tab is where you can check if your firmware is up to date, and upgrade it to the latest version with one click. You can also download the latest firmware file manually from the Arturia website, and upgrade from that file instead.

> Firmware updates are an important way to give you continued product support and new features. We recommend checking for updates periodically, to ensure that you are getting the most optimal experience with your MiniFuse.



The **ASIO** tab is where you can select the buffer size to be used when running in ASIO mode, and enable or disable **Safe Mode**.

ASIO is a Windows audio protocol that is optimized for low latency and high fidelity. We recommend using the ASIO driver provided by Arturia for best results; it's downloaded with MiniFuse Control Center, and is automatically installed with the software unless you specifically uncheck its install box.

What's Safe Mode for? In some cases, using a lot of processing in a DAW (e.g. with effects or plugins), or setting low buffer sizes on an older PC, can cause the CPU load to be very high. A high CPU load can increase the risk for audio dropouts (pops) to occur. In these cases, **Safe Mode** can be enabled to avoid the risk of audio dropouts, at the cost of slightly increased latency.

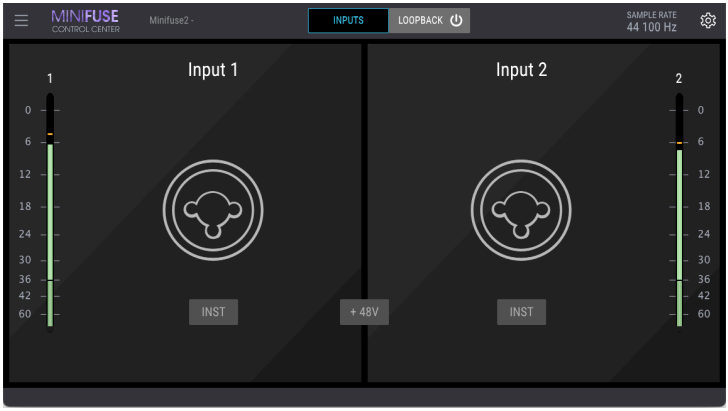
Finally, there's a button that says **This is the current ASIO device**. If you have more than one MiniFuse installed, you can use this button to set which MiniFuse uses the ASIO driver.

> This tab does not appear in the Mac version of the software. macOS uses its own protocol, Core Audio, which doesn't require special settings and allows the use of multiple MiniFuse units at once.

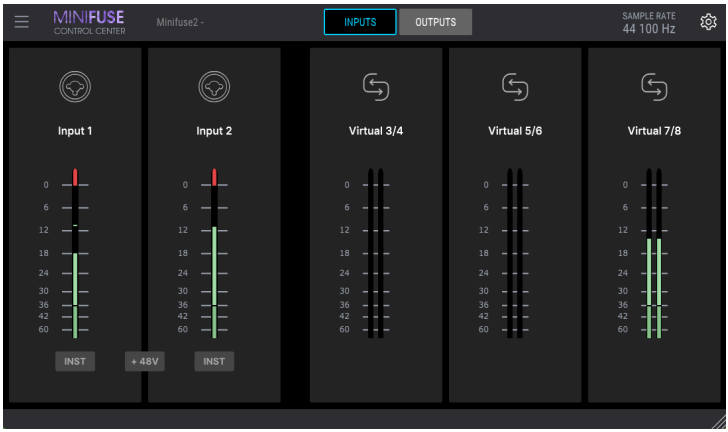
6.3. Device Controls and Input Metering

The central area of the application provides access to various device controls, making it easy to change certain settings directly from your computer.

The following controls are found on the **Inputs** tab, which presents a slightly different feature set for macOS vs. Windows.



The Inputs tab in macOS, with metering and controls for the two Inputs



The Inputs tab in Windows, with metering for physical and virtual inputs

- **Inst** toggles the high-impedance circuit for either input, for use when recording guitar, bass, or electric piano.
- **+48V** turns on *phantom power* for all inputs. Phantom power is a +48V voltage that coexists with a microphone's audio signal on the mic cable; it provides power that certain mics (usually condenser models) require to operate.

> For more information on the Inst and +48V features, please see the Front Panel Features [p.4] section of this manual.

- **Level Meters** provide a high-resolution display of input levels for the corresponding input. These can be useful when setting the Gain for the input. The meter features a Clip indicator which lets you know if the input has been overloaded, or "clipped". Once the Clip indicator has been activated, it will remain lit for the amount of time specified in the Settings window [p.21] Preferences tab.

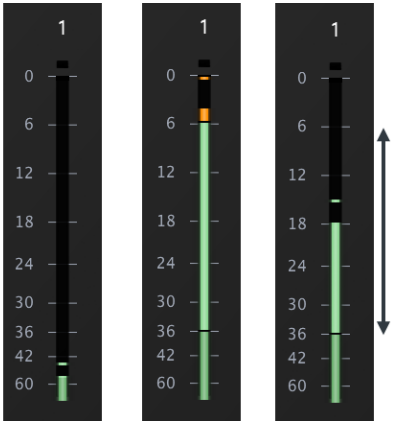
> Note that the Windows version has three more level meters than the Mac version. These will be explained in the chapter on Loopback Recording [p.25].

6.3.1. General advice for setting input levels

Be careful not to overload the inputs, which will result in distorted recordings. Giving yourself plenty of "headroom" will ensure that you don't distort the recording in loud parts of the performance.

When recording at 24-bit resolution (bit rate), you do not need to push the input Gain very high. This is because the noise floor at higher bit rates is much lower than that of 16-bit recordings, so you can record with lower gain to avoid distortion. When you turn up the level in the mix, very little noise will be added.

The green range of the meter, from -36dB to -6dB, is the optimal range we recommend for capturing a good signal without clipping. See the three examples below - the one on the left is too quiet, the one in the middle is too loud and may result in distorted audio recordings, and the one on the right shows the ideal volume range to ensure crisp and clean recordings with lots of detail.



Level settings. L to R: too low, too high (distorted), and ideal

6.4. Loopback (Mac) and Outputs (Windows)

The other tab on the interface is **Loopback** on the Mac (with a power button icon to disable it) and **Outputs** on Windows.

The Mac and Windows versions of MiniFuse Control Center differ somewhat in their implementation of *loopback*, a feature that lets you record the output of the MiniFuse back into your DAW or other applications along with the audio inputs. You can read about this in the chapter on Loopback Recording [p.25].

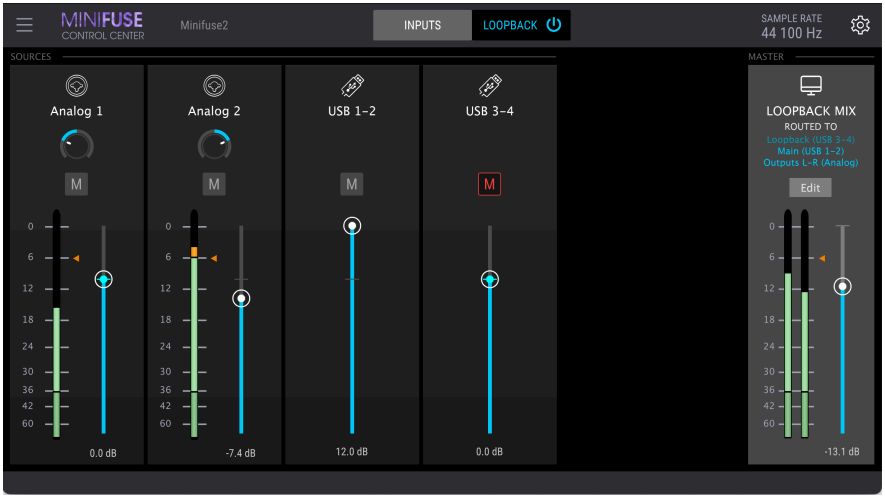
7. LOOPBACK RECORDING

The MiniFuse Loopback Recording feature allows you to record any audio playing on your computer directly into your recording application, without the need for special cables or complicated software workarounds. Loopback Recording uses sets of virtual inputs on the MiniFuse, into which you can route any computer audio, vastly expanding the types of sound sources available for recording into your projects.

> The procedure is different for macOS and Windows. We'll cover the Mac first.

7.1. Loopback (macOS)

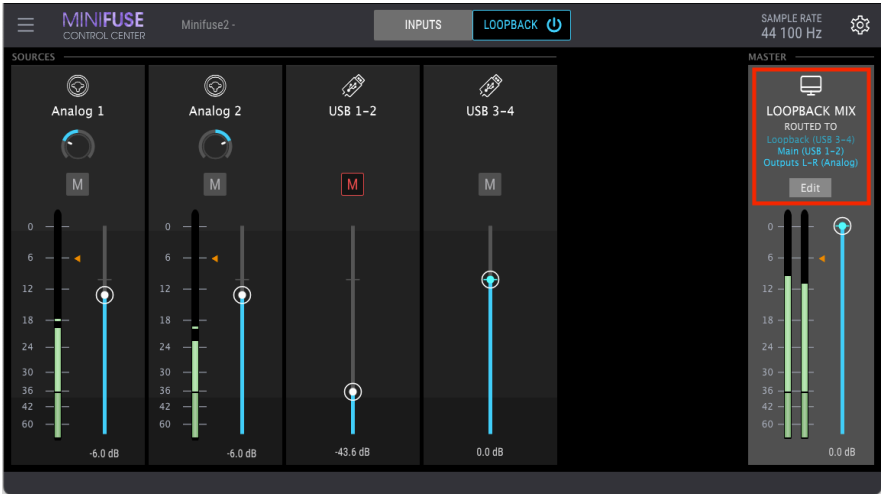
On the Mac, clicking the **Loopback** tab opens the following screen:



The Loopback tab

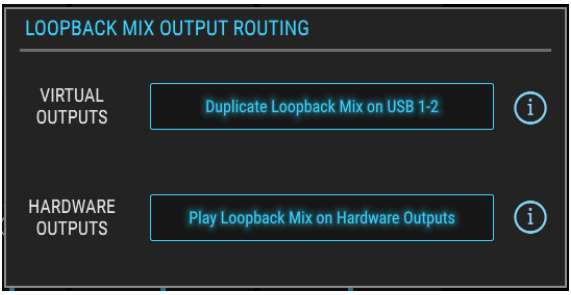
Even though your MiniFuse has only one or two physical inputs and two physical outputs, to your recording and playback software it appears as an interface with four inputs and four outputs! Inputs and Outputs 3/4 exist only in software – they can route audio between applications inside your computer, allowing you to do loopback easily.

As you can see, the Loopback tab has a mixer where you can adjust the level, panning, mute status of the two Analog inputs, and two USB stereo signals: USB 1–2 and USB 3–4. This mix can be sent to one or more destinations, depending on the settings in the Master channel:



Outputs for the Loopback mix are listed here

Depending on where you've elected to route your audio, up to three destinations are listed in blue: **Loopback (USB 3-4)** is always enabled, and you can add either **Main (USB 1-2)** or **Outputs L-R (Analog)**, or both. This is chosen by clicking the **Edit** button, which brings up these two buttons:



Settings made available from the Edit button

Duplicate Loopback Mix on USB 1-2 is useful when you're recording to software that can only see the first available pair of USB inputs (i.e. 1-2). This button routes the loopback mix to the Main USB 1-2 outputs, so you can still record the loopback mix. You can leave this button off if you're recording to software that can see USB 3-4 as inputs.

Play Loopback Mix on Hardware Outputs routes the Loopback mix to the headphone jack as well as the physical outputs on the rear panel of the MiniFuse, so you can hear what's happening in the loopback mix. This isn't needed if your recording software allows monitoring of your inputs, but it's useful for quick monitoring or for very simple recording applications.

> For best results when using this feature, set the MiniFuse's **MIX** knob to 100% USB (all the way to the right).

7.2. Software Loopback Solution (Windows)

The **Software Loopback Solution** (**SLS**) is an extension of the Loopback function described above. It gives you a great deal of flexibility in recording and playing back audio, within an easy-to-understand user interface.

> SLS is currently available only for Windows PCs with the MiniFuse 1 and 2. A macOS version is forthcoming, as is a version that works with the MiniFuse 4.

Even though your MiniFuse has only one or two physical inputs and two physical outputs, to your recording and playback software it appears as an interface with eight inputs and eight outputs! These four stereo pairs allow you to route audio to and from multiple apps, in addition to listening to your audio from the MiniFuse.

Here's how it works.

> All of the images shown here will be from a MiniFuse 2, but the exact same features apply to the MiniFuse 1.

7.2.1. Physical vs. Virtual Inputs and Outputs

In addition to the physical inputs and outputs on your MiniFuse, there are three sets of stereo *virtual inputs* and *virtual outputs*. They don't exist in physical form... but your software doesn't know that!

With these virtual channels, you can get your various apps to share audio smoothly. You can easily create workflows that are great for podcasts, live streaming, and more. It's all done in SLS inside your computer, so your MiniFuse just has to deal with what's actually going in and out of the box.

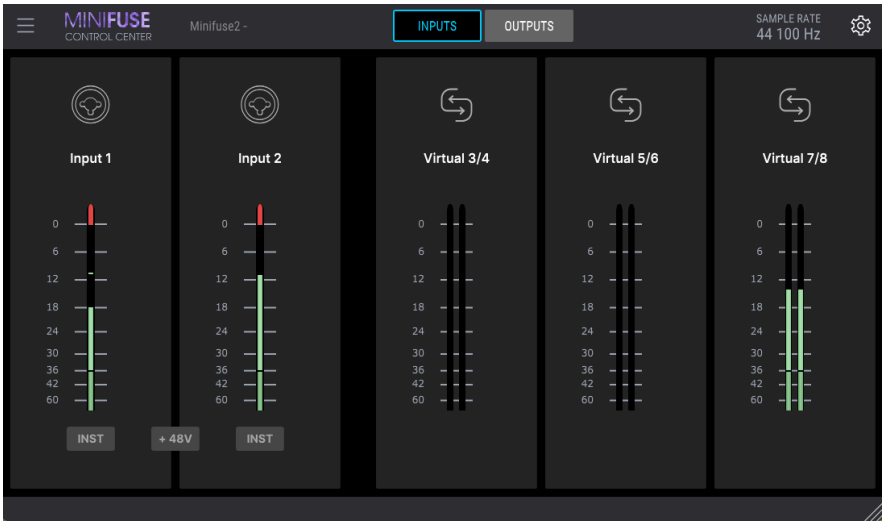
Imagine a typical livestreaming setup, where you may be:

- recording yourself and a guest on two mics (panned left and right to put some space between you), while *also*
- running OBS Streamlabs to send the video and audio out to the world, while *also*
- talking with an interviewee via Zoom or Skype, while *also*
- playing back a music bed, while *also*
- recording music to and from a DAW or other app

...and have it all happen *live*, rather than mixing it all together later in post-production. Thanks to SLS, you can do all these things at once, sending different mixes to video, chat, and your DAW.

7.2.1.1. Inputs

Clicking on the **INPUTS** button in the Top Toolbar of MiniFuse Control Center [p.19] shows you the following screen:



The Inputs tab, with metering for physical and virtual inputs

As you can see, beside the meters for the Inputs (along with the indicators/buttons for Instrument inputs and phantom power), there are three more sets of meters:

- **Virtual 3/4**
- **Virtual 5/6**
- **Virtual 7/8**

These meters show the levels of audio signals being routed into SLS from various apps, as well as the MiniFuse's front panel input jacks. In our livestreaming example, let's say Inputs 1 and 2 are our microphones, Virtual 3/4 is audio coming in from the video software, Virtual 5/6 is audio from the conferencing software, and Virtual 7/8 is audio coming in from your DAW playback.

7.2.1.2. Outputs and mixes

Clicking on the **OUTPUTS** button in the Top Toolbar of MiniFuse Control Center shows you the following screen:

An example livestream mix in the Outputs tab

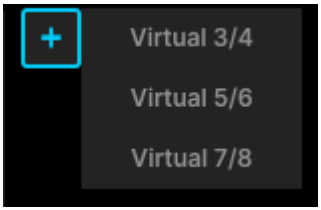
This is where the magic happens!

There are three subtabs for three different mixes. Each mix has a different set of inputs, each of which can have its own level, pan position, and mute status. Inputs 1 and 2 can be linked so one fader or mute button controls both inputs (pan settings are never linked).

- **Mix 1/2** is sent to the physical Out 1/2 of your MiniFuse. This is the mix you listen to on your speakers or headphones. It's also routed to virtual outputs 7/8 (see the *Note* below).
- **Mix 3/4** is sent to a pair of output channels that your computer sees as outputs 3 and 4 from the MiniFuse. You can set any app to accept audio from that pair of outputs, so you can capture the mix you've created.
- **Mix 5/6** operates in the same way as Mix 3/4, but is sent to a different pair of output channels (5 and 6) that can be routed to a different app.

In our livestreaming example (shown above), we have a mix of music playback, conference, and DAW audio, being sent out to our livestreaming software, which is currently listening to Mix 3/4 as a pair of inputs.

To add a set of virtual inputs to a mix, click on the + icon next to the last channel and select a pair of virtual inputs from the dropdown menu:



Click the + icon to add a virtual input pair

You can remove a channel strip for a virtual input by clicking the **X** in the top right corner. This lets you keep your mixes clean and simple, only showing what you need.

> You can't remove the channel strips for the physical inputs or outputs.

7.2.1.3. Keeping it simple: looping audio back to just one app

What if you just want to loop back your interface audio and record it in your DAW? That's easy to set up and doesn't require a fancy mix.

Remember that Virtual outputs 7/8 are always routed to the physical outputs of your interface, but can also be sent back as inputs to an app like your DAW. That routing happens automatically and is always active – you just have to tell your DAW to record inputs 7/8. Just set the levels of the Inputs and Main 1/2 output in Mix 1/2 and you're done.

In this example, a mix of the two inputs is being sent to the physical Out 1/2 and looped back to inputs 7/8 of the recording software:

A simple mix of two microphones sent to a DAW on Loopback 7/8

> This is essentially equivalent to the Loopback function in macOS.

8. A QUICK PRIMER ON DIGITAL AUDIO

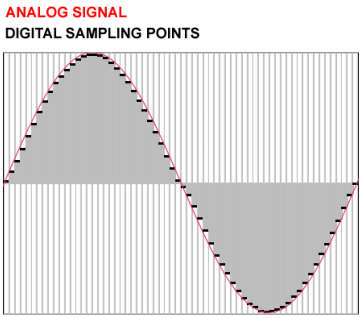
To get the most out of your computer and audio interface, it is important to be familiar with several key concepts in digital audio. We'll explain these quickly below, so that you understand their impact on performance. Once you are familiar with these concepts, you will know how to best calibrate your interface and computer settings to handle different types of audio tasks.

8.1. What is latency?

Latency is the amount of time that it takes your computer to process incoming and outgoing sound. Latency is an important consideration when recording live instruments or MIDI parts, as the delay between the input (audio or MIDI) and the audio output may negatively impact the performance and recording - think of how distracting it can be to hear your own voice with a short echo while on a phone call.

Latency is a direct byproduct of sample rate and buffer size settings, so adjusting these settings in your host application or the audio driver will have an impact on latency.

8.2. Sample Rate



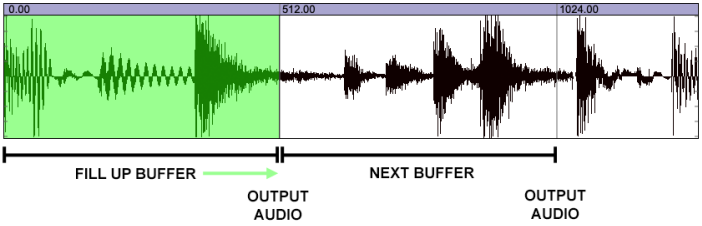
In the digital realm, analog audio signals are represented by discrete points in time, or "samples". When played back through a digital-to-analog converter, like those in computer soundcards, the digital samples are reproduced into a smooth audio signal. You can think of it like frames in a movie - each frame is a still snapshot, but when played back at a fast enough rate (24+ frames per second) our eyes perceive the sequence of static frames as continuous motion.

The sampling rate describes how many digital sampling points, or "frames", are used to approximate the audio signal over time. This also determines the highest frequency that can be captured or reproduced by the digital representation. The Nyquist-Shannon sampling theorem states that this is equal to 1/2 of the sample rate so, for example, the highest sound frequency that can be reproduced by a sample rate of 48kHz is 24kHz.

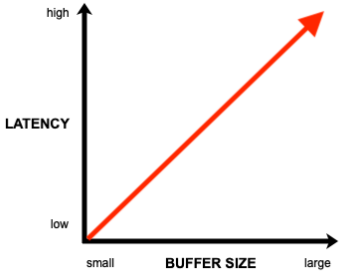
The average range of human hearing is 20 to 20,000Hz (or 20kHz). For most audio applications we recommend using a sample rate of 44.1kHz or 48kHz. Sample rate of CD-quality audio is 44.1kHz. Higher sample rates will result in significantly higher CPU usage, without much benefit to be gained in most circumstances.

Higher sample rates like 96kHz *can* be useful in sound design applications where you would like flexibility to apply extreme pitch adjustments to the recording. A sound recorded at 96kHz and played at half-speed would still be able to reproduce frequencies up to 24kHz, while the same sound recorded at 48kHz and played at half speed will only be able to reproduce frequencies up to 12kHz.

8.3. Buffer Size



Buffer size is expressed in samples and is usually found in your application's audio settings. Think of the buffer like a bucket. As soon as it fills up with samples, it is carried away to the output. So, the smaller the bucket (buffer) the quicker it will get filled up and sent to the output, and therefore will play back with less latency. The tradeoff, however, is that smaller buffer sizes require your computer's CPU to work harder. Conversely, the bigger the bucket (buffer) the longer it will take to fill up and be sent to the output. This decreases the load on your CPU at the expense of more latency. As you will see below, changing the buffer size depending on the type of audio task being performed is common practice.



If you experience clicks and pops in your projects, try increasing the buffer size in your host application or the audio driver.

8.4. A red herring

When experimenting with these settings, you may notice that latency decreases noticeably when using higher sample rates at the same buffer size. To go back to the bucket analogy, the sample rate is like water flowing through a hose - if your increase the water flow (higher sample rate), the same bucket will fill up faster and will be carried away to the output sooner. However, keep in mind that high sample rates come at a cost of significantly higher CPU usage, so this is not a recommended way of dealing with latency.

8.5. How to deal with latency

There are several ways to effectively deal with latency depending on the situation. Once you are familiar with the concepts outlined above, you will be able to dynamically adjust your system settings to accommodate various scenarios.

8.5.1. Recording live audio

When recording live audio from instruments and microphones, you probably want to avoid latency altogether. The MiniFuse features **Direct Monitoring** which will route the input(s) directly through the speakers or headphones. This lets you immediately hear what you're recording without incurring any latency from computer processing. Direct Monitoring is offered as a continuous Monitor Mix knob that you can use to control the balance between direct signal and computer signal.

> When using Direct Monitoring, you may need to turn off monitoring for the recording channel in your DAW to prevent an echo through the speakers or headphones. Direct monitoring routes the input(s) directly out of the outputs, so you will not be able to hear any software processing or effects that you may have applied to the recording channel in your application. For best results, we also recommend shutting down other CPU-intensive applications while recording live audio.

8.5.2. Recording a MIDI part

Since recording MIDI parts relies on the computer to produce sounds from your playing, Direct Monitoring is not an option in this scenario. When recording MIDI parts, you will most likely want to set a low audio buffer size in your host application's audio settings to minimize the delay between pressing a key and hearing the sound. We recommend buffer sizes of 128-256 samples but you could go lower or may need to go higher, depending on your particular computer system and how much CPU your project is using.

8.5.3. Mixing and mastering

Mixing and mastering are not time-critical tasks, so latency is not as important in these situations. It's also likely that by this stage your project has quite a few tracks and plugins, so your CPU may already be working hard to keep up. For mixing and mastering purposes we recommend buffer sizes of 1024-2048 samples. Again, depending on your specific system and project you may be able to use lower settings.

9. SPECIFICATIONS

9.1. Box Contents

- Audio interface
- USB-C to USB-A cable
- Exclusive software bundle containing:
    - Arturia's Pre 1973, Rev PLATE-140, Delay TAPE-201, Chorus JUN-6 audio effects
    - Arturia's Analog Lab Intro containing thousands of ready-to-use instruments and sounds
    - Ableton Live Lite
    - NI Guitar Rig 6 LE
    - 3-month complimentary subscription to Splice
    - 3-month complimentary subscription to Auto-Tune Unlimited
    - Ableton Live Lite sessions curated by producers around the globe

9.2. Hardware Specifications

Line Inputs	
Input impedance	16kΩ
Maximum input Level	+22dBu
Gain range	56dB
Frequency response 20Hz to 20kHz	+/-0.05dB (min gain)
Dynamic range	110dB typical (A-weighted)
THD+N @ 1kHz	-100dB typical (un-weighted)
Cross-talk @ 1kHz	-116dB

Instrument Inputs	
Input impedance	1.1MΩ
Maximum input Level	+11.5dBu
Gain range	56dB
Frequency response 20Hz to 20kHz	+/-0.06dB (min gain)
Dynamic range	110dB typical (A-weighted)
THD+N @ 1kHz	-91dB typical (A-weighted)

Microphone Preamps	
Input impedance	2.5kΩ
Maximum input Level	+9dBu
Gain range	56dB
Equivalent Input Noise (EIN)	-129dB typical (A-weighted)
Frequency response 20Hz to 20kHz	+/-0.06dB (min gain)
Dynamic range	110dB typical (A-weighted)
THD+N @ 1kHz	-100dB typical (A-weighted)
Cross-talk @ 1kHz	-116dB

Speaker Outputs	
Output impedance	94Ω
Maximum output Level	+12dBu
Frequency response 20Hz to 20kHz	+/-0.09dB
Dynamic range	107.5dB typical (A-weighted)
THD+N @ 1kHz	-101dB typical (un-weighted)

Phones	
Output impedance	10Ω
Maximum output Level	+11.4dBu
Frequency response 20Hz to 20kHz	+/-0.09dB
Dynamic range	104dB (A-weighted)
Power @ 33ohm	137mW

Various	
Supported frequency rates	44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz
USB 2 Audio compatibility	Windows, Mac OS

10. DECLARATION OF CONFORMITY

USA

Important notice: DO NOT MODIFY THE UNIT!

This product, when installed as indicated in the instructions contained in this manual, meets FCC requirement. Modifications not expressly approved by Arturia may avoid your authority, granted by the FCC, to use the product.

IMPORTANT: When connecting this product to accessories and/or another product, use only high-quality shielded cables. Cable (s) supplied with this product MUST be used. Follow all installation instructions. Failure to follow instructions could void your FFC authorization to use this product in the USA.

NOTE: This product has been tested and found to comply with the limits for a Class B Digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide a reasonable protection against harmful interference in a residential environment. This equipment generate, use and radiate radio frequency energy and, if not installed and used according to the instructions found in the user manual, may cause interferences harmful to the operation to other electronic devices. Compliance with FCC regulations does not guarantee that interferences will not occur in all the installations. If this product is found to be the source of interferences, which can be determined by turning the unit "OFF" and "ON", please try to eliminate the problem by using one of the following measures:

- Relocate either this product or the device that is affected by the interference.
- Use power outlets that are on different branch (circuit breaker or fuse) circuits or install AC line filter(s).
- In the case of radio or TV interferences, relocate/ reorient the antenna. If the antenna lead-in is 300-ohm ribbon lead, change the lead-in to coaxial cable.
- If these corrective measures do not bring any satisfied results, please contact the local retailer authorized to distribute this type of product. If you cannot locate the appropriate retailer, please contact Arturia.

The above statements apply ONLY to those products distributed in the USA.

CANADA

NOTICE: This class B digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulation.

AVIS: Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

EUROPE

CE

This product complies with the requirements of European Directive 89/336/EEC

This product may not work correctly by the influence of electro-static discharge; if it happens, simply restart the product.

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