

USER MANUAL

_COMP DIODE-609

ARTURIA

_The sound explorers

Special Thanks

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Product version: 1.0

Revision date: 8 June 2021

Thank you for purchasing Arturia's Comp DIODE-609...!

This manual covers the features and operation of the Comp DIODE-609 plug-in.

Be sure to register your software as soon as possible! When you purchased Comp DIODE-609, you were sent a serial number and an unlock code by e-mail. These are required during the online registration process.

Special Messages

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 or features without notice or obligation.

IMPORTANT:

The 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.

Introduction

Congratulations on your purchase of Arturia's Comp DIODE-609...!

Arturia's passion for synthesizers and sonic purity has given demanding musicians the best software instruments for professional audio production.

Arturia also has a growing expertise in the audio field, and in 2017 launched the [AudioFuse](#), a pro studio quality audio interface that features two proprietary DiscretePRO® microphone preamplifiers and a set of top-notch AD/DA converters. This line was recently expanded with the launch of the [AudioFuse Studio](#) and the [AudioFuse 8Pre](#). Arturia has also been busy making effect plug-ins, launching in 2018 the first Arturia effects bundle, which included the [Pre 1973](#), the [Pre TridA](#), and the [Pre V76](#). This was our first step in the field of audio effect processing plug-ins, and a logical one, considering all the experience gathered while programming the effects sections for our own synth plug-ins.

These also allowed us to take a first step in analyzing and reproducing retro and vintage analog audio processing units.

Other bundles followed, dedicated to compressors, filters, delays, and reverbs. More recently, Arturia added [three new effects](#) to the collection, this time dedicated to modulation, this way consolidating its position as a leader in audio effect plug-ins.

The ARTURIA Comp DIODE-609 is part of a set of three new effects plug-ins, this time dedicated to one of the most important tasks in audio processing: bus sound processing.

ARTURIA has a passion for excellence and accuracy. This has led us to conduct an extensive analysis of every aspect of one of the most famous compressor/limiter units built by a famous British manufacturer. Derived from the modules included in some of the most iconic mixers ever built, this unit later became an independent processor, and a favorite in many famous recording studios. We have carefully studied and reproduced the behavior of its electrical circuits and components. We have also developed it further, including some extras that enrich and expand its features.

The result is an effects plug-in that, although inspired by this sought-after compressor, includes what may be considered our vision of what a vintage compressor can be nowadays, suited for the modern studio environment.

Comp DIODE-609 runs as a plug-in in all major formats inside your DAW.

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The Arturia team

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1. WELCOME

1.1. What is a bus effect?

As far as audio effects are concerned, bus or masterbus effects occupy a place of their own. These effects are used to polish a more complex, many times composite sound, be it a group sub-mix or even the final master bus output. Since their main goal is to perfect and balance the overall sound spectrum (and maybe add some color to it), they are specially tailored for and tuned to those tasks.

Therefore, their audio circuits are more carefully planned and usually more complex, their components are chosen with top quality in mind, and more expensive and retro parts are sometimes used, like real tubes for example.

All in all, the objective is a sound that's richer, fuller and with more body, maybe supplemented with the kind of saturation you don't usually get in today's pristine audio chains, where we aim for the cleanest sound possible. And why not add a touch of EQ to make the sound a bit more transparent and detailed in certain bands?

Traditionally, there are just a few types of these bus effects: Equalizers, compressors (usually called bus compressors, to differentiate them from the usual channel compressors), and maybe more complex units with complete audio channels, comprising several modules.



1.2. What about the Comp DIODE-609?

There are many reasons to use a compressor/limiter. For example, it can be used to protect a recording (and your ears) from excessive peaks that can sound distorted and potentially damage your speakers (or your hearing). Also, reducing the loudest parts of a recording can make for a far more pleasing listening experience. This is because listeners can turn up the volume and hear the softer parts without fear of earache when the louder parts come. This is especially true in music with dynamic instruments that can produce sudden loud peaks like a drum kit or the human voice. Compressors can even be used creatively, to shape and contour sounds in pleasing ways. This flexibility is what makes compressors one of the most popular tools in a recording engineer's toolkit.

In a mix bus, it is more a matter of sculpting the tone to what better suits your taste (or the taste of the author, if you are working for someone else), or of adapting to the style of music you are aiming for. There are many different types of compressors. That's why we can say that we can never have too many compressors.



Arturia already proposes a pack of [three compressor plug-ins](#) modeled after vintage units from the past. The Arturia Comp DIODE-609 completes that package, while also beautifully fitting the FX Collection 2. This is a stereo bus compressor unit inspired by classic designs first seen in vintage mixing desks of a very famous British manufacturer. These classical mixing desks may be seen in prestigious recording studios everywhere around the world. Some devices made after the design of its individual modules have been manufactured and are still sold today.

This was exactly the case of the hardware compressor being emulated here. It was a compressor/limiter unit inspired by the modules that were featured in the mentioned consoles. These modules present a very smooth and creamy dynamics processing, which adds weight and color to instrument groups and individual tracks. Using a diode-bridge topology, they have separate compression and limiting circuits and are perfect for sculpting the tone while applying dynamics control to any source. That's why later on these circuits were featured in this compressor/limiter unit that became also famous.

Using this plug-in means you will get the richness given by the old analog discrete circuits coupled with a modern design and features adapted to the modern studio and the working environment of the computer.

The distinctive sound of the devices this software is modeled after, their much sought-after "glue factor" and their colorful, rich British compression character, allows you to have that "polished/expensive record" sound in your individual tracks and stereo buses.

1.3. Where can you use a plug-in like this?

The Comp DIODE-609 plug-in is very versatile. It really shines in complex audio, like groups and sub-mixes, where it may contribute to creating a more homogeneous (glued) sound, but it is also perfectly suitable for individual audio tracks as a channel compressor. It can be used pretty much everywhere.

The original has often been used as a stereo bus coupled with an analog EQ (such as the the SITRAL-295, also featured in this FX Collection 2) to "warm up" digital stereo tracks. But many also swear by it as a killer kick /snare or even vocal compressor. Others also mention it as being great for acoustic piano.

There are even those who mention it as a great bass comp. But don't hesitate to use it out of the group and master buses to reveal its full potential, especially when coupled with an analog EQ.

However, that's on group and master buses that it really shines, especially when coupled with an analog EQ as mentioned before.



2. ACTIVATION AND FIRST START

The Arturia Comp DIODE-609 plug-in works on computers equipped with:

Windows 8 or later and macOS 10.13 or later.

You can use the Comp DIODE-609 plug-in as an Audio Unit, AAX, VST2 or VST3 plug-in (64-bit only).



2.1. Activate the Arturia Comp DIODE-609 license

Once the software has been installed, the next step should be to activate your license, so that you can use it without limitations.

This is a simple process that involves a different software program: the Arturia Software Center.

2.1.1. The Arturia Software Center (ASC)

If you have not already installed the ASC, go to this web page:

<https://www.arturia.com/support/updates&manuals>

Look for the Arturia Software Center at the top of the page, and then download the version of the installer that you need for your system (macOS or Windows).

Follow the installation instructions and then:

- Launch the Arturia Software Center (ASC)
- Log into your Arturia account
- Scroll down to the My Products section of the ASC
- Click the Activate button

That's all there is to it!

2.2. Working with plug-ins

The Comp DIODE-609 can be used in all major digital audio workstations (DAWs), including Live, Logic, Cubase, Pro Tools and others, as it comes in all the main plug-in formats. Unlike what happens with hardware, you can load as many instances of the effect as you find useful. Using the software plug-in has two other big advantages over hardware:

- You can automate numerous parameters using your DAW's automation system;
- Your settings and current plug-in state will become recorded in your project, and you can pick up exactly where you left off the next time you open it.

3. COMP DIODE-609 OVERVIEW

3.1. Arturia's Comp DIODE-609 plug-in

Our goal was to give users the experience of a great tool, a Compressor/Limiter modeled after one of the most sought-after hardware units, that descends from modules featured in some of the most iconic mixers of the seventies and eighties.



The user interface we created allies the simplicity and analog feel of the original with a modern approach more suitable for working in a computer environment. The Main panel has the controls for the Compressor section, the Limiter section and some switches on the right side, to control Mid/Side, changing from Stereo to Dual Mono, and channel linking

We also have a pair of VU meters to display the amount of gain reduction. Clicking on these changes them to a digital overview of the audio representing simultaneously the original input volume, the output volume and the gain reduction applied.

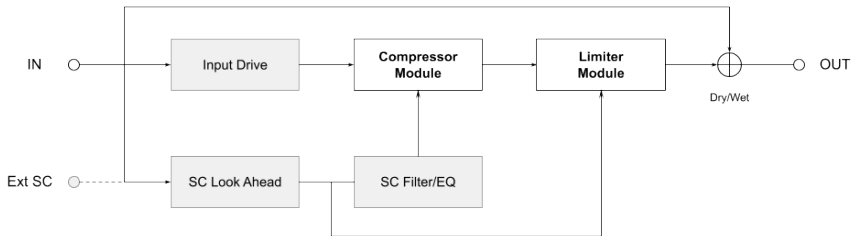
There is also an advanced panel, as has become usual with almost all the effect plug-ins from Arturia. There, we have the controls for the side-chain, which largely expand the processing capabilities of the compressor/limiter.

We will take a detailed look at all these elements in the [Control Panel chapter \[p.15\]](#). Now, it's time to check out how it works and how it sounds. Let's go!

3.2. Understanding the Comp DIODE-609 Signal Flow

The Comp DIODE-609 is a compressor/limiter effect plug-in specially tailored for bus tasks. As we stated in the Introduction, bus effects tend to be a little more complex (both in functionalities as well as their inner workings) than their channel counterparts. Being inspired from classic units featured in iconic mixers of the seventies, it keeps the simplicity of those units. This means that, although its musicality makes it suitable for bus mixing, it is simple to operate and understand, and you can (and probably should) also use it in regular audio channels. However, bear in mind this is a compressor/limiter mainly thought for overall sound sculpting.

Let's take a look at the inside, to understand a little more about Comp DIODE-609:



When the audio signal enters the unit, it is split in three paths. The first one is the Dry path. The second is the Wet path, which is routed through the different processing modules of the plug-in.

There is a third path, that is used solely for detection purposes. This is the Side-Chain (SC) path, which may use the signal coming from the Input or an external side-chain signal.

The signal routed through the Wet path enters the Input Drive, which works as a preamp before the signal goes to the Compressor Module. It also induces a certain amount of saturation to the signal when it is above 0.00 dB.

After this stage, the signal reaches the Compressor module. Compression will happen according to the set parameters, driven by the Side-Chain signal, in either stereo mode (in which case compression will happen equally on both sides, controlled by the average volume of both side-chain channels) or dual mono mode (in which case each channel will be compressed differently and controlled by its correspondent side-chain channel).

After passing through the Compressor Module, the signal goes through the Limiter Module, where it will be limited, again according to the set parameters, and also controlled by the side-chain signal in exactly the same way as in the Compressor module.

The Side-Chain signal may be routed through the Look Ahead module (in which case some latency will be induced, due to the nature look ahead works), or bypass it and be routed through the SC EQ/Filter module. This module output can only be used in the Compressor module. Therefore, the side-chain signal used for limiting purposes will always be unprocessed, as reflected in the signal-flow diagram above. The SC EQ/Filter module can be bypassed, in which case, also the side-chain signal used for compression will be unprocessed.

After the Limiter module, the Wet path signal is mixed with the Dry path signal. The resulting signal is then sent to the Output. Mixing is controlled by the Mix knob, and allows for different amounts of processed and unprocessed signal, in what is commonly known as parallel compression.

And that's it. This is the complete signal flow of the Comp DIODE-609. Study the circuit carefully, spend some time with the controls of each module, try the different routings and signal configurations, try the side-chain possibilities, and we're sure you'll fall in love with this unit and will enjoy its incredible power. The next section will definitely help you with this.

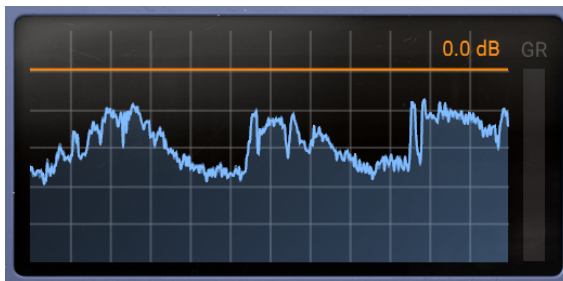
3.3. Getting hands-on with Comp DIODE-609

3.3.1. The basics



DIODE-609 with the two channels unlinked and two different compressor and limiter settings

- Load a stereo clip into an audio track in your DAW (or use a submix or group track in one of your music projects, or even the master stereo output). A master out or group submix would be great, since this is more of a tone sculpting compressor/limiter;
- Load an instance of Comp DIODE-609 as an insert in that track. Open the plug-in window;
- Ensure the Default preset is loaded. This way all parameters assume their default values. Now click the "Advanced" button on the right side of the Upper Toolbar. This will open the Advanced control panel below the main compressor controls;
- Start playback. You will notice several things. First one is there is just a very slight difference in the audio (you may check this by switching the plug-on off and on again). Switching it off will put it in Bypass, leaving the audio untouched - only the VU meters remain active. That's because, with the controls at their default values, only the transformer model and the diode bridge model will be processing the audio. If you click the vintage VU meters to change the display to the modern digital one, you will see a flat line representing Gain Reduction, and below the volume contour (In and Out are exactly the same). The GR level indicator to the right remains Off, meaning there isn't any reduction happening;



- This display may not look as "vintage" or "cool" as the other one, but certainly gives you much more information. Anyway, you can always go back to the other one by clicking to it again;

Now it's time to start processing the audio:

3.3.2. The Compressor

- With the audio playing, turn the Threshold knob until you start to see the GR line move. The GR level indicator will also start to show an orange fill in the upper part. This means that some gain reduction is now applied. The threshold sets the volume around which the compressor starts applying gain reduction;
- Now that you are compressing, you have to define the compression ratio. This ratio sets the amount of gain reduction. It shows the "ratio" between the output level (the value on the left) and the input level (the value on the right, which is always 1, for comparison purposes). The level of any signal above the threshold will be divided by the value on the left. So, when you have a ratio of 2:1 it means that for a level 1 dB above the threshold, the output will be reduced to half of it. For example, if a signal exceeds the threshold level by 2 dB, it will be attenuated to a value just 1 dB above the threshold level. Bear in mind that compression reduces the dynamic range, and the dynamic range is what makes the music "breathe". Let's pick a ratio that's not too high, like 2:1;
- Now that you have set threshold and ratio, it's time to define the attack and release values. You may think of these as envelope segments, like the ones you have in synthesizers. Attack marks the time it takes for the compressor to react (reach the set compression ratio) once the audio goes over the threshold;
- The Attack time must be defined according to the type of audio you are dealing with. Vocals don't have much in the way of attack transients you may want to preserve, therefore the attack time there may be shorter. On complete drum tracks, where you need to preserve the attack transients, the attack time may be longer, but if you want a "pumping" effect, you can opt for a very short value (in this case with a higher compression ratio). If you are using the compressor in a bus channel, as is the case here, you probably want longer attack times, to avoid messing with the attack transients. The original hardware unit has a fixed attack time of around 3 ms, but here you have other options too. Let's pick something like 25 ms;
- Rules of thumb for setting Attack: faster attack times make the sound tighter and more even. They may give you a smoother front end sound. But there is also the risk of cutting off the attack transients, making the overall sound duller and lifeless. Slower attacks allow for a lot of initial impact so they may result in a punchier sound. Attack transients will be more present, which gives a better definition. On the other hand, any time inconsistencies will be exposed and accentuated;
- Now, it's time to set the other envelope segment. Recovery is a parameter that is nowadays usually referred to as Release. In a compressor, it sets the time it takes to "restore" the original dynamics after the audio falls under the threshold level. You need to give the processor enough time for a smooth transition. Again, this also depends on the type of audio you are dealing with. There are a few things to take into account when setting release times, Please refer to the point below about the rules of thumb;
- In complex programs, some events might need a short release and others a long one, so a fixed value is a compromise. An automatic release may fix that. We have two automatic recovery times (labeled **a1** and **a2**). **a1** varies the release times between 100 ms and 2 seconds, while **a2** varies the release times between 50 ms and 5 seconds. You may start by trying those. If you don't get the result you're aiming for, start with a longer recovery time, and then try reducing it until you feel something "strange" (like a pumping effect) happening. Then restore the previous value;

- Rules of thumb for setting Recovery: faster recovery times mean compression stops quickly after the signal has fallen under the threshold. The result is a more aggressive sound. But going too fast on recovery times sometimes produces “pumping” artifacts. Slower recovery times give you more dynamics and smoothness, while exaggerating can mess up the groove and feel of the track. Also, release times are tied to attack times. Fast attack with slow release work as a “protective” leveler, while slow attack and slow release work as a slow RMS program leveler. On the other hand, fast releases with slow attacks let the transients pass and make the compression expand the dynamic range;
- Finally, you just have to set the makeup gain. Most of the time, you will only need to add a little bit of gain;

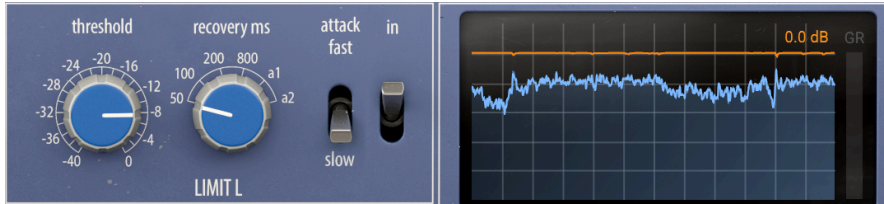


Comp DIODE-609 set for compression

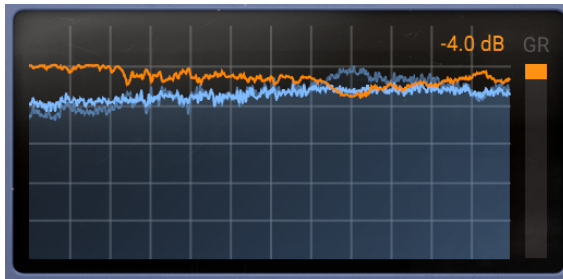
Now that we have seen how the Compressor works, it's time to check the Limiter:

3.3.3. The Limiter

- First turn off the Compressor section. You can do this using its "In" switch. When a section is off, the audio bypasses it without any processing being applied, no matter what values that section is set for. This is a good way to try each section individually and to hear its effect on the overall audio;
- With the Compressor section turned off, only the Limiter will process the audio. Remember that a limiter is a special kind of compressor with a very high compression ratio, which acts as a ceiling for the audio, preventing it from going over the value set by the Threshold. The Limiter Output Gain (make up) is defined in the Lower Toolbar. You have a small display for each channel, with a default value for the Limiter audio output gain set at 0.00 dB (no gain);



- With the Limiter output gain set to 0 dB, you will only have to move the Threshold. In most cases, you will only need to adjust the Threshold slightly, and it is not advisable for the GR line above the volume lines to move too much or too often;
- If you move the Threshold low enough, you'll notice that the overall volume decreases, and you'll see the orange line go down below the Input Line. This means that the Limiter ceiling is now below the original output level, and the audio output is being "squeezed" to fall under that ceiling;
- You may now raise the Limiter Output Gain to compensate for the volume loss;



This is a drastic way of using a Limiter. You may not want to do this, although this is a good way to learn how a Limiter works. It's up to you to decide what better suits your taste and your needs. However, do bear in mind that the GR line above the volume lines should not move too much or too often.

Now it's time to take a look at the Advanced Panel features:

3.3.4. Advanced Panel

- First, switch to Dual Mono to treat each stereo channel as a separate entity;
- Now press the Advanced button to open the Advanced panel. First thing will be to switch on the Look Ahead feature. This induces latency, but since we are dealing with a bus track, it doesn't matter much. Look Ahead allows the processor to "read" the audio signal prior to processing it, which allows for a better compression by anticipating level changes. We will set the Look Ahead value to the max - 5 ms.
- We will use the internal audio as side-chain source. You can also use an external source. Please refer to your DAW's manual to know how to properly route audio to achieve this;
- Press the side-chain listen button to monitor the original input audio. Now switch on the side-chain equalizer. It's time to process the side-chain signal in order to achieve a better detection signal. Remember that this processing is just for the detection path - it will not affect the audio output in any way;



- In our testing, we opted to leave the high pass filter off, as the audio doesn't have much lower frequency content. This may change, so it's up to you to decide what fits best in the each circumstance. Activating the high band and reducing it, while increasing the middle band, will increase the middle frequencies. This way, you will get a more balanced detection signal. Since we activated the dual mono switch, each channel will be triggered independently. This will result in more balanced dynamics for both channels;
- Now, it's time to add a little character to the audio by turning the input drive knob. This parameter is very subtle, so do not be surprised if you don't notice much difference.

3.3.5. Other functionalities



- You can treat the two channels of the stereo as separate entities. To do this, click the "param unlink" switch, to put it in the unlink position. Now, you can change parameters for one channel while the other remains untouched. Don't do this if you want to preserve stereo consistency, but it can save the day if your stereo image is severely unbalanced;
- Dual mono is about the way detection works to trigger compression. Generally, the average stereo level is taken into account, and compression is triggered equally on both channels. But if you activate dual mono, the left channel signal triggers compression for the left side, and the right side signal triggers compression for the right side. Again, this may be good when you are dealing with an unbalanced stereo signal, with or without parameters unlinked. It may also be handy when dealing with external side-chain sources;
- M/S stands for Mid/Side. Mid/Side is another way to control the stereo image, used in some recording environments. For a more detailed explanation, please refer to the [Mid/Side mode \[p.19\]](#) entry in the Control Panel chapter of this manual.
- To the right of the M/S switch, you have the Mix (Dry/Wet) knob. This is the usual Dry/Wet mixer control. With it, you can control the amount of unprocessed signal that will be mixed with the processed signal in the plug-in output, to achieve what is known as "parallel compression";
- Above the switches is a pair of "vintage" VU meters. These display the gain reduction. Clicking them changes the display to a modern digital one, which is more accurate and best suitable for a computer environment.
- Finally, you have the On switch. This bypasses the audio processing circuit, but the plug-in still receives audio to be able to display the output signal on the meters.

And that's it. These are just a few examples of what you can do with Comp DIODE-609. This is a very musical compressor /limiter, capable of some subtle (or not so subtle) tone sculpting. It is very easy to operate, and you can get great results with it. Yet there's more to it than meets the eye, and if you pay attention to detail and invest some of your time to learn how to use it, you will be able to get the most out of it. As always, use your ears and persevere, to find the best and more interesting ways of using it.

4. COMP DIODE-609 CONTROL PANEL

The Comp DIODE-609 plug-in can be used in Mono, Mono-to-Stereo, and Stereo configurations.

The Mono configuration is automatically loaded when you use the plug-in with mono tracks. When inserted in stereo tracks, the Stereo configuration is automatically loaded as well.

By default, the plug-in works according to the source material.



Not all DAWs work with mono tracks, in which case you will not be able to use the mono configuration.

4.1. Channel Configuration (Mono/Stereo)

In stereo mode, the plug-in loads in full, with two processing modules, one for each channel. When instantiated in stereo channels, the plug-in loads in stereo mode.

When instantiated in mono channels, the plug-in loads just one processing module. Also, the M/S switch, Link switch and Stereo/Dual Mono switch are absent, as they would not have any role to play in a mono signal.



Comp DIODE-609 Mono configuration.

4.2. Main Control Panel

The Comp DIODE-609 Graphical User Interface uses a classic retro look that closely resembles the look of the unit being emulated. Even the Advanced Panel (which doesn't exist in the original hardware unit) follows the same look. The only exception to this is the modern VU meters that are reachable by clicking the "vintage" VU meters. This way, you get the classic look of the original, but we can also have a display that's more modern, and adapted for working in a computer environment. This is a mixed approach that we feel works better with a computer, without losing the retro feel we love so much.

As is the case with the previous effects, as well as all current Arturia plug-ins, this GUI has an Upper Toolbar and a Lower Toolbar. The Lower Toolbar is very important, because it gives you access to the Undo and Redo functions, lists the editing history, to bypass the plug-in (this button completely bypasses - turns off - the plug-in, contrary to the Power button on the Main control panel) and displays CPU consumption.

Of course, the Upper Toolbar is also very important, since it is where you access the main menus, perform important tasks like loading and saving presets and banks of presets, and where you can select a preset and see the name of the active preset. The toolbars and their features are covered in detail in the [User Interface chapter \[p.29\]](#).

We'll now look at all the controls available, explaining what they do, their ranges and how to interpret their numbers.



Comp DIODE-609 Main Panel in Stereo mode.

Notice that each time we click a control (knob or button), or simply hover the mouse over it, the Lower Toolbar displays the parameter name at the bottom left. Also, a small pop-up displaying the current parameter value appears to the right of the control. This changes every time you move that control, updating the parameter value in real time.

Now, let's take a look at each control on the Main Control Panel.

4.2.1. Stepped Controls

Notice that there are some special "buttons" or "displays" in the Lower Toolbar, besides the ones already mentioned. One of them is labeled "Stepped Controls". By default, DIODE-609 loads with Stepped Controls on, to be faithful to the original behavior (the unit didn't have continuous controls - the control knobs switch to predetermined values). This means that when you move a control, it jumps from one value to the other.

For a more modern behavior, (which is probably what you are used to) please press the Stepped Controls button in the Lower Toolbar. This will turn that feature off, and you will have the usual continuous values control behavior. Beware that this only applies to knobs. Switches and buttons will still have predetermined values, as usual.

4.2.2. Limiter Make-Up Gain (Left and Right)

To the right of the Stepped Controls button, you have two displays with values in dB. These are the Make-Up Gain controls for the Limiter output of each channel. By default they are set to 0.00 dB, which means the Limiter will limit the volume output to that value. That's also the minimum value. You can change this up to +20.0 dB, but you will probably leave the value at 0.00 dB (the default) most of the time.

4.2.3. Right Section



4.2.3.1. Link/Unlink Channels switch

This switch links or unlinks both channels. When channels are linked, the values of each channel mirror those of the other channel. This way, when you edit ANY of the two channels, the other one changes exactly the same way. By default, the switch is in the Link position, which means that any change made on one channel is replicated on the other. To unlink, just click it and the Link button will turn off.

When the switch is in the Unlink position, each channel becomes independent, allowing for different values.

4.2.3.2. Stereo/Dual Mono Channels switch

This switch activates the Dual Mono behavior. Stereo and dual mono refer to the internal sidechains and their computed gain reductions, and whether they are independent or not.

When the switch is in the Dual Mono position, the compressor acts as two channels with independent side-chains. If the mode is Stereo, the compression is driven by the average of both channels side-chain signals.

You may want parameters linked or unlinked, to keep things balanced in terms of gain reduction, but with slightly different adjustments for the two channels (more useful in M/S than in Stereo).

With the Stereo/Dual Mono alternative, combined with the Stereo (LR) versus M/S alternative, you can fine tune what is triggering the compression, without the stereo image shifting (stereo mode) or the wideness changing (M/S).

4.2.3.3. Stereo [LR] vs M/S switch

This switch controls the way the plug-in works when instantiated in stereo channels. Default behavior is the stereo mode, where both channels are treated the regular way (Left and Right).

4.2.3.4. Mid/Side mode switch

Mid/Side (M/S) is an alternate mode to regular Stereo. This mode is a highly effective way of making adjustments to the spacialization of a mix or master. In Mid/Side, the Mid channel is the center of a stereo image, while the Side channel covers the edges of that same image. When you make adjustments in the Mid channel, this is perceived in the centered image of the stereo spectrum (think of it as the mono compatible image). For example, a boost in the Mid channel will make the sound more "mono" (both channels will sound more equal).

On the other hand, when you make adjustments in the side channel, this will have an impact on the width of the stereo image, and a boost in this channel will result in a more spacious (wider) stereo sound.

In M/S mode, the controls corresponding to the Left will affect the Mid channel, while the controls corresponding to the Right will affect the Side channel.

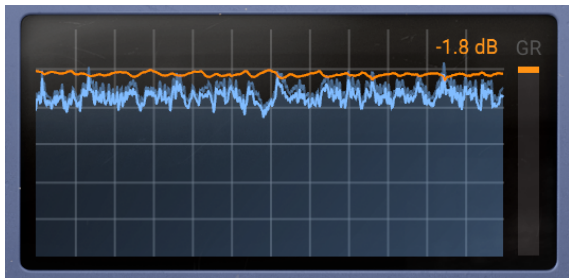


The Link, Stereo/Dual Mono and M/S switches are only present in the stereo version of the plug-in, as they need two audio channels to work. Therefore, these switches do not appear in the mono version.

4.2.3.5. VU meters

These are a close emulation (up to the ballistics) of the original hardware unit's own VU meters. They show the Gain reduction reached by the unit.

Alternatively, you can have modern digital VU meters where you will have a display of the history of the volume input and output, and a Gain Reduction indicator on the right. You access this modern display by clicking the vintage VU meters. Clicking again will change the meters back to vintage.



4.2.3.6. Power

This switch turns the plug-in on and off. Turning it off has almost the same effect as pressing the Bypass button in the Lower Toolbar - it bypasses all audio processing in the the plug-in. However, when the plug-in is bypassed by turning the power switch off, it still receives audio, to display the output signal on the meters.

4.2.4. Compressor Section [Main Panel]

This is the main section of the plug-in. Here, you control the compressor part of the plug-in. Don't be fooled by the apparent simplicity of the Compressor. It is capable of very powerful and musical results, despite the reduced number of controls.



4.2.4.1. Threshold

The Threshold is one of the most important controls in a Compressor. This is where you define the level around which the Compressor section starts to reduce the Gain. The behavior of the Threshold depends a lot on the knee (also known as Compressor Curve) used. With modern compressors, you can often control the knee, but that wasn't the case in older units, where the knee was a built-in characteristic, and very dependent on the type of compressor.

It is the case of this compressor. It has a fixed compressor curve, which defines its musicality. Since the knee is fixed, there is no control for it.

The Threshold may be set as low as -40 dB (meaning almost any audio will be compressed) all the way up to 0 dB (which basically means no compression). A good range usually varies from -8 dB to 0 dB, but it depends much on the kind of material you are compressing. On a masterbus, compression should be gentle and soft, therefore the threshold shouldn't be very high. On the other hand, if you are using this on a drums bus, or even for individual drums like kick or snare, you may want a lower threshold.

Ideally, the Threshold should be just above the average signal level. By default, it is positioned at 0 dB, which we can consider a "neutral" position (basically, no compression).

4.2.4.2. Attack

The Attack time is a very important control in a compressor. It defines how long it takes for the compressor to fully compress the signal when it exceeds the threshold value. Manipulating this parameter can completely change the character of a sound. Very fast attack times cause the compressor to squash the signal. On the other hand, very long attack times will let almost all transients pass through, which, in the worst case scenario, can totally undermine the goal you were pursuing by using compression in the first place.

Attack times in the Comp DIODE-609 are expressed in milliseconds. The original hardware unit had a fixed Attack value of around 5 ms. We preserved this behavior as Default, but we also decided to give you, the user, the option to change it. That's why you can change values by moving the Attack control knob. The lower value available is 5 ms and it can go up to 75 ms. Since this compressor is mainly intended for bus and mastering purposes, fast attacks may not be desirable, and longer attacks allow more attack transients to pass, this way preserving the character of the audio.

4.2.4.3. Recovery

This corresponds to the release time (the time it takes for the compressor to restore the original audio behavior, after compression), as seen in most other compressors .

The Recovery parameter may be considered the inseparable partner of the Attack. As the latter controls the time it takes for compression to start when the Threshold is exceeded, the former tells the Compressor how long it should take to bring the signal back to the original value after it has fallen back under the Threshold.

As you can see, all these parameters are linked. Attack and Release act like the segments of an envelope triggered by the Threshold, and whose sustain level is defined by the Ratio. In this case, the envelope is inverted, which means the sustain level is lower than the original level.

Since Recovery is a time parameter, it can be faster, or slower (just like Attack). The effect it has varies, depending on the type of audio you are dealing with (again, just like with the Attack parameter). It is also tied to the Attack time in use, especially if we are dealing with complex audio, which may be the case with the Comp DIODE-609. You may wish to check the [hands-on section \[p.9\]](#) for details on how to use these two parameters combined.

Release times in the Comp DIODE-609 are also expressed in milliseconds. This control only accepts fixed (predetermined) values. The values accepted are 100 ms, 400 ms, 800 ms, 1500 ms. Besides these, you have two extra positions, labeled "**a1**" and "**a2**", which are automatic recovery times. In these positions, recovery is self adjusting, and is faster for transient peaks and slower for persistent higher audio levels, to preserve a more natural dynamic range and behavior. These auto recovery times just have two different time constants to suit different program material, like speech vs music. **a1** varies the release times between 100 ms and 2 seconds, while **a2** varies the release times between 50 ms and 5 seconds. The best way to check how handy these may be is for you to try them out (in case you want to use automatic recovery times, of course), to see which one better suits what you want to achieve.

By default, the Recovery time is positioned at 100 ms.

4.2.4.4. Makeup Gain

Because, by nature, compressors reduce the overall volume level, we need to raise the final output volume in order to compensate for that reduction. That's what Make-Up Gain is there for.

Range goes from 0 dB to +20 dB. By default, the control is set to 0 dB (no gain).

4.2.4.5. Ratio

Together with Threshold, and complemented by Attack and Release, this is where you mainly act to find the best settings for the compressor.

This parameter defines how much compression (level and dynamic reduction) is applied to the audio when the detected signal level exceeds the Threshold. Just like Threshold, Ratio is also influenced by the "compressor knee". Since the Comp DIODE-609 has a hard knee, the maximum compression effect is reached at about the set Threshold level, and there will be almost no compression below that level.

Compression level is expressed as a ratio. The right-hand value is the compressed level, while the left-hand value is the original. When you see a compression ratio of 4:1, it means that an original value of +12 dB will become reduced to just +3 dB after compression is applied.

For a compressor like this one (a bus and master compressor), VERY gentle ratios are preferable (usually no more than 2:1, most of the time less than that). This also depends on the type of music and the results you are striving for, of course.

Generally, it is better to start with the lowest compressor ratio, and raise it when you feel the need. Remember that Attack and Release times are also important to take into account.

Compression range goes from 1.1 (1.1:1, meaning that there is almost no compression) up to 6:1. This may not seem like much when compared, for example, with the values of the other compressors already released by Arturia, but you must remember we are dealing with another kind of compressor here. This one is more suitable for bus and mastering (although it can be used elsewhere) and therefore extreme compression is not what it was made for. It was conceived to "glue" the audio together, creating a more homogeneous and polished final sound. Therefore, lower values are best for this task.

By default, Compression is positioned at 2:1.

4.2.4.6. In switch

This switch allows to bypass the Compressor section. By default, the switch is On, which means the audio will pass through the compression circuit, and will be processed by it. When the switch is in the Off position, the audio will bypass the Compressor circuit.

4.2.5. Limiter Section (Main Panel)

This is where you control the Limiter section of the Comp DIODE-609. A Limiter is a special kind of compressor, that basically acts as a ceiling for the audio, with an infinite ratio compression. That's why you don't have a ratio controller here.



4.2.5.1. Threshold

The Threshold here works in much the same way as in the Compressor section. This is where you define the level around which the Limiter section starts to act (in this case, it is the ceiling the audio level will reach). The behavior of the Threshold depends on the knee, as is the case with the Compressor, but the Limiter curve is much harder.

In the Limiter section, the Threshold has the same range as in the Compressor section. Therefore, it goes as low as -40 dB (meaning almost any audio will be limited) and all the way up to 0 dB (basically no limiting). A good range usually varies from -3 dB to 0 dB. On a masterbus, limiting is just a safety measure, therefore the threshold shouldn't be very low.

Ideally, the Threshold here should be set so that it is rarely reached. By default, it is positioned at 0 dB, which we can consider a "neutral" position (basically, no limiting).

The limiter ratio of the Comp DIODE-609 is very high. Therefore, any value above the Threshold is effectively prevented from leaving the plug-in.

4.2.5.2. Recovery

The Recovery in the Limiter section is very similar to its counterpart in the Compressor section. The only difference is the values available. In this case, you can go lower (which is understandable, since this is a Limiter, and the audio needs to recover faster from limiting). The fastest Recovery value is 50 ms, and you have 100 ms, 200 ms and 800 ms. Besides these fixed values (which are much lower than those available in the Compressor, as you have probably noticed), we also have the automatic "a1" and "a2" positions.

As explained in the hands-on section and the Compressor section, these are automatic, program-dependent recovery times. This means that the recovery (release) time is controlled by the signal so that it is shorter for isolated peaks and extended in the case of high average levels. The **a1** position has a release that varies from 100 ms to 2 seconds. The **a2** position has a release that varies from 50 ms to 5 seconds.

By default, the Limiter Recovery time is set to 50 ms.

4.2.5.3. Attack switch

This switch has two positions: Fast and Slow. Fast here should be construed as "faster", but not "very" fast. Fast will be around 2 ms, while Slow is around 4 ms. Anyway, a very fast attack is ill-advised with a Limiter because it messes with the attack transients of the music.

That's why the default position for this switch is Slow.

4.2.5.4. In switch

As with the Compressor section, this switch allows to bypass the Limiter section. By default, the switch is On, which means the audio will pass through the limiting circuit, and will be processed by it (which still may not have any influence, since when the controls are in their default positions, the audio will not be processed anyway). When the switch is in the Off position, the audio will bypass the Limiter circuit.

4.2.5.5. Makeup Gain

Make-Up gain controls for the Limiter appear in the Lower Toolbar, as two boxes displaying values in dB. You have one control for each channel. Because, by nature, the Limiter will reduce (limit) the overall volume level, you may want to raise the final output level in order to compensate for that reduction. That's what these controls are there for.

Range goes from 0 dB to +20 dB. The default value for each box is 0 dB (no gain).

4.2.6. Advanced Panel

The Advanced Panel chiefly covers the controls for the Side-Chain circuit.

It is organized in three main parts (side-chain source selector and look ahead; side-chain equalizer; side-chain listen) plus an extra control labeled Input Drive.



4.2.6.1. Side-Chain switch [source selector]

This is where you select the Side-Chain source. Side-Chain is the signal used to control the compression applied to the audio. It can be that very same audio (this is the most common case) but, if that option exists, it can also be an external signal, coming from another track, for example.

When you hear about side-chain, it is that external signal that is usually being referred to. This may be used to achieve control of separated instruments (for example balancing the mix between the kick drum and the bass), or to achieve "another" special effect called "pumping".

For this, you need to be able to feed an external signal into the signal path (usually another mix track), to be used as source by the detection path in order to trigger compression.

In Comp DIODE-609, we have both Internal and External sources. By default, Internal source is selected, which means that the audio that will drive compression is the same audio being compressed.

Please refer to your DAW's manual to check how to route audio to be used as an external side-chain source.

4.2.6.2. Look Ahead

This feature allows the plug-in to analyze the audio ahead of the position that's being played. We can choose to analyze the audio as early as -5 ms. By looking ahead, the plug-in can offer a better compression (this function is only available on the compression circuit), but at the cost of induced latency.

Look ahead allows the compressor to anticipate a transient and compress just before it happens, without lag, to fully control it. Loss of punch and more audible pumping are possible side-effects.

When you are not using this feature, the On/Off switch lets you disable it in order to avoid adding latency.

4.2.6.3. Look Ahead In switch

This switch enables or disables the Look-Ahead function without changing the value set for it. You can therefore quickly test it out and check the audio results and latency induced. By default, the switch is off.

4.2.6.4. Side-Chain Equalizer

The Side-Chain audio circuit has its own equalizer, to further sculpt the audio that will trigger the Compressor circuit (but not the Limiter circuit). This only affects the audio that will feed the side-chain circuit, so even if the audio that's going into the side-chain is the internal audio, its output will not be affected by the EQ settings.



High Pass Filter

This is a low-cut filter with a fixed slope of -12dB per octave, and continuous frequency ranging from 20Hz to 640Hz, with an Off position. By default, it is Off.

Mid Freq

This is a very broad bell (peak) band with a center frequency that may go from 80 Hz (quite low) up to 10 kHz and a variable range (range varies according to the Gain). By default, it is placed at 1.2 kHz.

Mid Gain

Mid Gain ranges from -10 dB up to +10 dB. The bigger the gain (positive or negative) the broader the range (Q) of the band. By default, it is placed at 0, which means the band is inactive.

High Shelf

This is a Shelf Band with a gentle slope going from -10 dB up to +10 dB. Frequency has a fixed center value positioned at 3 kHz. By default, it is placed at 0, which means the band is inactive.

In Switch

This switch turns the EQ on and off (bypasses it). By default it is Off.

4.2.6.5. Side-Chain Listen

This button activates side-chain signal monitoring. This may be useful and important when processing the side-chain signal (for example with the EQ). By pressing the button, the side-chain signal is routed to the output, allowing the user to listen to the result of EQing that signal.

This may also be important when using an external side-chain signal. When it is On, the red LED lits up.

By default, it is Off.

4.2.6.6. Input Drive

This knob allows you to change the saturation induced by the Comp DIODE-609. When at zero, the saturation induced is similar to the emulated hardware unit.

Range goes from 0.00 dB up to +24.0 dB. 0.00 dB is the default.

5. USER INTERFACE

The Graphical User Interface of the Comp DIODE-609 follows the Arturia paradigm developed in the most recent effect plug-ins.

The GUI is built around a main control panel inspired by the looks of the original controls present on the famous compressor unit which inspired it. It also features an Advanced Control Panel with a few extra functions, an Upper Toolbar and a Lower Toolbar.


The Upper Toolbar contains the Preset Selection displaying the name of the current selected preset, preset selection filters and navigation arrows, and the very important Main Menu on the left (the "hamburger" icon to the left of the plug-in name). It also has a button to access the Preset Library, and the Advanced button to access the collapsible Advanced Control Panel.

The Lower Toolbar displays the parameter names and brief explanations in the left-hand part. It also includes the Bypass button, a History button, Undo and Redo buttons, and a CPU consumption meter.

Besides these, there is a very important button, labeled "Stepped Controls". We already mentioned this button in the [Control Panel chapter \[p.15\]](#), but we will reference it again in the proper place.

Finally, we have also the gain controls for the Limiter.

The parameter values appear in small floating window "cells" next to the parameter control. The values update in real-time when you move the controls.

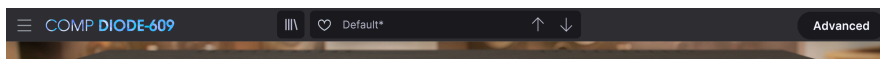
 To see the current parameter value, position the mouse over the corresponding control for about one second, and a small window appears next to it revealing the value.

It is a very clear and straight-forward User Interface. That will always be the main focus of every Arturia product: to unleash your creativity while remaining easy to use.

We've already looked at the control panels. Now it's time to look at the toolbars.

5.1. The Upper Toolbar

The plug-in GUI (Graphical User Interface) has the usual Arturia toolbar that runs across the top edge, with the main menu / plug-in name on the left (the colored part), followed by the Library button and the Preset name, with arrows to navigate through the different presets stored in the library. To the right, there is a prominent "Advanced" button, which opens and closes the collapsible Advanced Control Panel below the Main Control Panel.



Let's now take a look at the Main Menu options. Since these options are also common to all current Arturia plug-ins, you may already be familiar with them:

5.1.1. New Preset

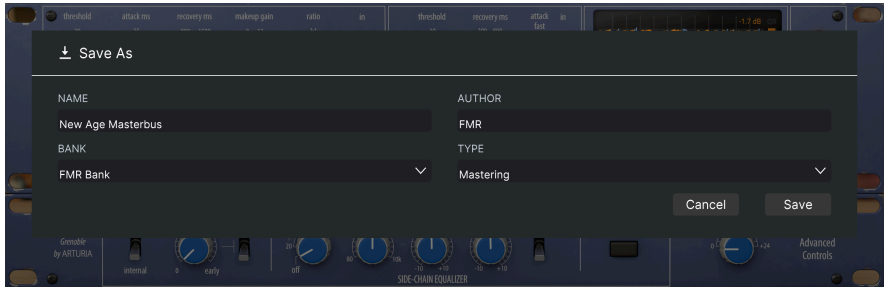
This option allows you to create a new preset based on the Default template.

5.1.2. Save Preset

This option will overwrite the active preset with any changes you have made, so if you want to keep the source preset too, use the Save As option instead. See the next section for information about this.

5.1.3. Save Preset As...

When you select this option, you are presented with a window where you can enter information about the preset. In addition to naming it, you can enter the Author name, and select a Type. You can even create your own Type by entering custom names in the Type field. This information can be read by the preset browser and is useful when searching for the preset later.



5.1.4. Import...

This command lets you import a preset file, which can be either a single preset or an entire bank of presets. Both types are stored in **.diidx** format.

After selecting this option, the default path to these files will appear in the window, but you can navigate to whichever folder you are using to store presets.

5.1.5. Export Menu

You can export presets in two ways: as a single preset or as a bank.

- **Export Preset:** Exporting a single preset is handy when you want to share it with someone else. The default path to these files will appear in the "Save" window, but you can create a folder at another location if you like. The saved preset can be reloaded with the import preset menu option.
- **Export Bank:** This option can be used to export an entire bank of presets from the plug-in, which is useful for backing up or sharing presets.

5.1.6. Resize Window options

The Comp DIODE-609 window can be resized from 50% to 200% of its original size without any visual artifacts. On a smaller screen such as a laptop, you might want to reduce the interface size so it doesn't dominate the display. On a larger screen or a second monitor, you can increase the size to get a better view of the controls. The controls work the same at any zoom level, but they can be harder to see at the smaller magnification values, or when using high resolution monitors (like HD monitors or higher). The higher the resolution, the bigger the size you should use.

5.1.7. Tutorials

This option opens a panel on the right with Tutorials about the plug-in. Please try these to get more information and insights about the way this plug-in works.

5.1.8. Help

The Help section in this menu allows direct access to the User Manual (the document you are reading), as well as to the FAQ (Frequently Asked Questions).

5.1.9. About

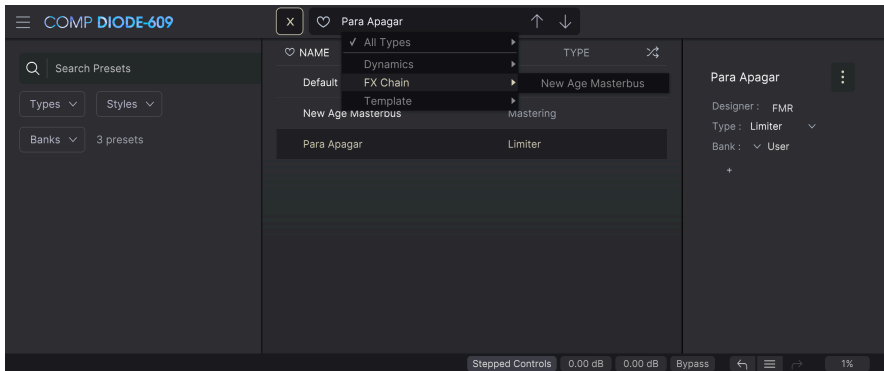
This opens the information window of the plug-in with the name, credits, and (more important) the number of the version installed. Don't forget to frequently check the Arturia Software Center for updates.

5.1.10. Preset Selection

The [Preset browser \[p.35\]](#) can be opened by clicking the library symbol on the toolbar. The filter, name field and Up / Down arrows in the toolbar all assist with preset selection.

Select a preset by clicking the preset name field in the Upper Toolbar. That action will open a list with all the presets available. The currently selected preset is marked with a ✓. Then simply place the mouse over the name of the preset you want to select (the preset name will be highlighted), and click it.

Alternatively, you may use the Preset Up and Down arrows (the arrows to the right of the preset name field) to navigate through all the presets.



The Preset Selection list opened over the Preset Browser window. These are two complementary methods to look for and select presets.

5.2. The Lower Toolbar

When you hover the mouse over a parameter control, you will see a readout showing that parameter name and a brief description of it in the left part of the lower toolbar.

Also, you will notice that a small popup window shows at the side of the parameter control, displaying the current value of the parameter. This will also show the value changes when you move the control (edit the parameter). This is handy, because you don't need to touch the parameter control to read the current value, and also you may keep looking at the parameter while you read the value changes.



On the right side of the lower toolbar are several small windows and buttons. These are very important features, so let's take a closer look.

5.2.1. Stepped Controls

The plug-in controls only move to predetermined values. This behavior reproduces the original behavior of the vintage unit which inspired this plug-in.

To change to the usual behavior, where you can define any value for these parameters, just press Stepped Controls. When 'Stepped Controls' is OFF, you're not stuck to the values provided by the original unit and can choose any value in between: continuous controls.

By default, Stepped Controls is on, so you have to press it to be able to move the controls to any value you like.

5.2.2. Limiter Makeup Gain (Left and Right)

The Limiter Makeup Gain allows to control the gain of the Limiter. Being a special kind of Compressor, the Limiter may also reduce the overall level of the audio when applied. This is where you can compensate for that gain loss.

We have a gain control for each side. Gain can go up to 20.0 dB, and defaults to 0.00 dB (no make-up).

5.2.3. Bypass

This one is obvious. Activating the bypass option will completely disable the Comp DIODE-609 plug-in. This action may also be performed via the Power switch. When the plug-in is bypassed, the GUI is dimmed and shows the word "Bypassed".

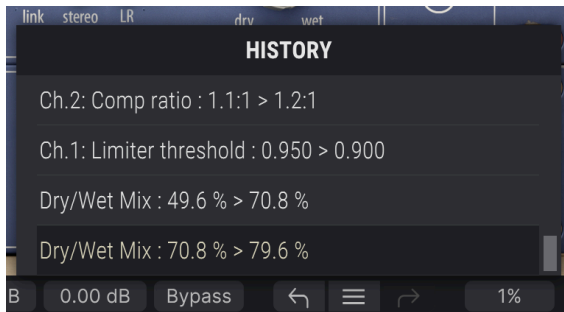


5.2.4. Undo

The Undo button is a curved arrow pointing to the left. This button reverses the last edit you performed. If clicked repeatedly, it will reverse the parameter changes in the order they were performed in the session, from the latest ones to the earliest ones.

5.2.5. History

This button lists all the latest parameter changes performed in the current session. You can always see the last four edited parameters, but using the mouse wheel or the navigation bar to the right allows you to access earlier edited parameters.



5.2.6. Redo

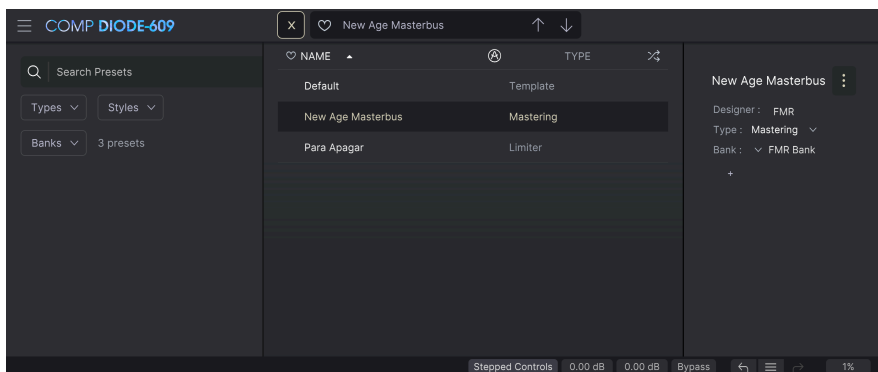
The Redo button is a curved arrow pointing to the right. This button works exactly the opposite way of the Undo button. It will reinstate the last undone edit. If clicked repeatedly, it will reinstate the parameter changes in the order they were undone (the latest undone ones first).

5.2.7. CPU meter

The CPU meter is used to monitor how much of your computer's CPU is being used by the plug-in. If you stress your computer too much, the global performance of your system and the audio may suffer.

5.3. The Preset browser

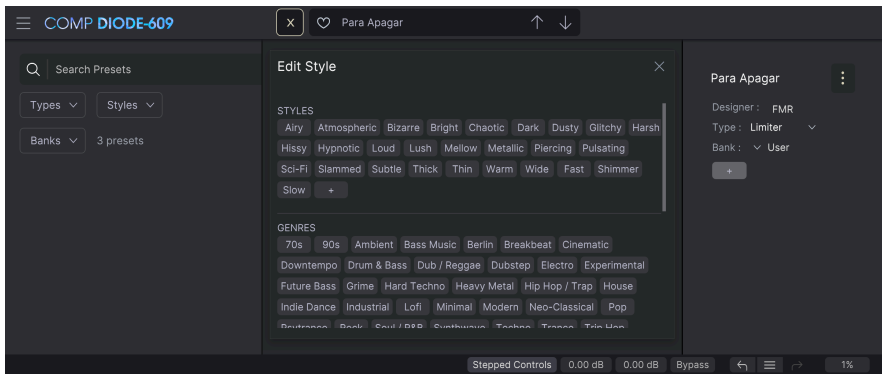
The preset browser enables you to search, load and manage preset configurations in Comp DIODE-609. Although this is based on the usual Arturia Preset Browser, it is simpler, and even easier to work with. You access the preset browser by clicking the library symbol next to the preset name field.



When you click the library symbol, you will see a screen with all the Presets you have saved. You can sort the list by several different criteria to make it easier to find the right preset. There are two columns. The first one can list the Presets by Name or by "Featured". The Featured presets are deemed of particular interest by Arturia, and are marked with the Arturia logo. The second one lists the Presets by Type.

There are other attributes you can use to filter the list. These are in the left column. There, you have the Types button, but also Styles, Banks, Genres, and Characteristics. If you click in one of these buttons, a list opens in the middle column, where you can select the tag you want to search for. A button appears in the left column, showing how many results there are for the tag you selected. Clicking that button will open the presets that fall under that classification. You may filter by more than one tag, in which case only the presets that fall under ALL of the tags will be displayed. Beware that you don't filter too much or might get no results.

You can also simply type a word in the search box (the one on the top left, to the right of the magnifying glass), in which case all presets containing the word you typed in the name will be displayed. For example, let's say you want to search for a preset containing the word "drum". You simply type "drum" and, if they exist, all the presets containing those letters (even if the word is "drums" and not "drum") will be displayed. If the word is the name of a style, you may opt to choose by that style.

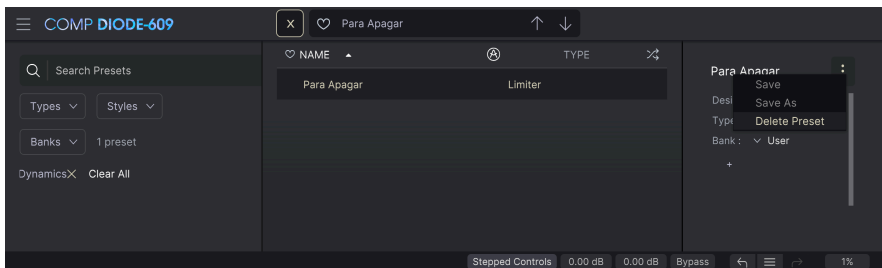


If you select Bank and choose a Bank, the Bank content will be immediately displayed.

When you click a preset name, that preset is selected, and you may see all the relevant information about it in the right column. There, you have the preset name, preset designer, type tag, bank it belongs to, and also all the other tags that have been added to it. If the preset belongs to a user bank, you also have a + sign, meaning you may add other tags. Tags are important, since they may help you quickly find what you are looking for, even among an extensive list of presets.

5.3.1. Delete Preset

If you want to delete a preset, first select it on the preset list. Next, click the library button to open the library. The Library window opens, with that preset still selected. In the right-hand column, you have the info column for the preset, with the preset name. To the right of the name, you have a button with three dots. Clicking it opens a sub-menu with three options: **Save**, **Save As** and **Delete Preset**. Choose the "Delete Preset" option. A dialog box opens asking you to confirm. You may now confirm or cancel the operation. If you confirm, the preset will be deleted.



5.4. Fine-tuning parameters

Typically, to change values in the plug-in controls, just click the corresponding control and drag the mouse up or down. If the controls are switches, simply click them to toggle On or Off.

If you want finer editing values, you can use Ctrl+Drag (Cmd+Drag for macOS). Alternatively, you can Right-Click and Drag. With this technique the values change more slowly, which enables you to edit them with greater precision.

5.5. Resetting your controls

Double-clicking a control automatically changes it to the default value.

And that's it. We have just finished describing all the controls you have at your disposal to process sound in your DAW using the Comp DIODE-609 plug-in. We hope you'll enjoy your new plug-in (and the results you get with it!) as much as we enjoyed making it.

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