Neodynium

Dynamics Plug-In

User's Guide

Version 1.0

Mac
Windows

VST / Audio Unit / RTAS

ELEMENTAL
audio | systems

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Elemental Audio Systems
Research Triangle Park, NC
USA

Welcome to Neodynium

Congratulations! You have purchased Elemental Audio Systems' next generation dynamics plug-in, **Neodynium**. Since **Neodynium** is a plug-in, you gain access to its functionality via your favorite audio processing or editing software. Once properly installed, both mono and stereo versions of **Neodynium** will be accessible via the appropriate menu item, often labeled Plug-Ins or Effects, in your compatible software application.

If you thought you knew compression, think again. **Neodynium** is an amazingly flexible and intuitive compressor, unlike any you have seen before. **Neodynium** introduces the concept of compression Zones with individually configurable attack, release, and ratio. With **Neodynium's** Zones, you specify exactly how ranges of your audio's levels are compressed. There's no one-size-fits-all compression here. Produce complex, but subtle changes in your audio or completely alter the sound. **Neodynium** can help you bring out nuances you didn't even realize were present.

A compressor's usefulness is reduced without the ability to choose and, when necessary, modify the audio that is used to trigger its compression. **Neodynium's** key mechanism isn't an afterthought, but an integral part of its functionality. Choose RMS or Peak analysis of your key. Filter your key with up to three key filters, choosing from one of seven available filter types, Use any input channel as your key or, if your host supports it, the sidechain input. You can even audition your key at multiple places in the signal path to ensure it is having the desired effect.

In addition to all the above, **Neodynium** provides you with extensive metering, including traditional peak and not-so-traditional "cloud" meters. You even get an input and two output meters for your key. Two workspaces allow you to create and compare changes to your compression settings and you can save and load settings that will be available to you in any host. Of course, **Neodynium** supports sample rates up to 192 kHz. All this, and more, in an intelligent interface that clearly shows you the changes you are making to your audio - without the need to reverse engineer a transfer curve to determine what the compressor is doing.

Looking for a highly usable compressor that stretches far beyond the traditional? Don't look any further - **Neodynium** is here.

Enjoy!

How Neodynium Works

Compressors are perhaps the most misunderstood and misused audio tool - and it is easy to understand why. Unlike the graphic equalizers so popular today, it is not always obvious exactly what a compressor is doing. To meet this challenge, compressors have evolved to display transfer curves to give a hint to their action. Some even superimpose the input and output levels onto the transfer curve and/or allow the user to manually modify the curve. This approach, however, still does not adequately address the issue. While transfer curves provide added compression flexibility, moving points around a graph to build a transfer curve is not exactly intuitive, or expressive. Furthermore, it is not readily apparent, by looking at the transfer curve, the effect the compression is actually having on the audio's levels.

Neodynium moves beyond the compressor - transfer curve paradigm, with a revolutionary new interface that allows full visualization of the compressor's action. A glance at Neodynium's Input/Output (I/O) Map gives a clear and accurate picture of (1) the audio's input-output relationship and (2) how much compression is being applied at each audio level. Similarly valuable, Neodynium's Key Level Meters, when used to compare the target and actual processed levels of the key input, provide detailed feedback on how the compressor's attack and release settings are affecting its ability to meet the specified goals. This information is critical to quickly focusing on, and maximizing the value of compression efforts.

Integral to its I/O Map approach is Neodynium's powerful concept of compression "Zones." A Zone maps a finite range of input levels to a specified range of output levels. Each Zone has separate attack and release settings to fine tune the response and thus, the overall sound, of the compression. When properly utilized, Neodynium's Zones can produce delicate compression effects or completely alter the audio's sound. Zones afford the user the flexibility to design a compressor for the specific task at hand and the power to achieve effects impossible with other compressors.

Rounding out Neodynium's compression mechanism is its peak limiter, for those times when the audio should absolutely not exceed 0 dB. Neodynium's limiter is unconventional in every aspect, employing an automatic, adaptive algorithm that preserves as much audio detail as it can before clamping down to prevent an overload. Neodynium's limiter does not make use of controls like those found on more traditional limiters. Instead, it monitors the audio signal, becoming active when needed and only utilizing one of three simple settings to serve as a hint of how quickly it should react to impending overs.

Neodynium delivers transparent, effective compression without compromising the audio's character. Because it couples a user-intuitive interface along with advanced compression technology, Neodynium can quickly and easily be used to create detailed and sophisticated compression effects.

Minimum System Requirements

Check the installation instructions below for system requirements specific to the plug-in format(s) you will be using.

Installing Neodynium

Installing Neodynium is quick and painless. Read the section below for the version of Neodynium you would like to install.

If you downloaded your version of Neodynium and it is in a compressed format (".sit", ".hqx", ".tgz", ".zip") you must first decompress the file using the appropriate utility. If a disk image file (".img", or ".dmg") is included in the package, double click the file to mount the disk image then proceed to the appropriate section below.

Audio Unit

System Requirements:	PowerPC G4 or higher processor Mac OS X v10.2 or higher, required Audio Unit compatible host application
Channel Layouts:	Mono Stereo

You will probably want to uninstall the Neodynium demo from your computer before proceeding with the installation of the full version. To uninstall the demo, use the uninstaller (see **Uninstalling Neodynium***) or locate and remove the Neodynium Demo.component file from your computer. By default, this component is installed to ~/Library/Audio/Plug-Ins/Components.*

Instructions

Once you have uninstalled the demo, double click the installer and follow the prompts to complete installation. If an installer was not provided, please consult the release notes for more detailed installation instructions.

By default, the Audio Unit will be installed to the ~/Library/Audio/Plug-Ins/Components folder (under your home directory). Documentation is installed to the Elemental Audio Systems folder in your home folder (~/Elemental Audio Systems).

VST

You should uninstall the Neodynium demo from your computer before proceeding with the installation of the full version. Having the demo and full version both installed confuses some VST hosts. To uninstall the demo, use the uninstaller (see **Uninstalling Neodynium***) or locate and remove the Neodynium Demo file from your computer. By default, this file is installed to ~/Library/Audio/Plug-Ins/VST.*

Mac OS X

System Requirements:
PowerPC G4 or higher processor
Mac OS X v10.2 or higher, required
VST compatible host application

Channel Layouts:
Mono
Stereo

Instructions

Once you have uninstalled the demo, double click the installer and follow the prompts to complete installation. If an installer was not provided, please consult the release notes for more detailed installation instructions.

By default, the VST plug-in will be installed to the ~/Library/Audio/Plug-Ins/VST folder (under your home directory). Documentation is installed to the Elemental Audio Systems folder in your home folder (~/Elemental Audio Systems).

Windows

System Requirements: Pentium 3 or similar processor
Windows 98/ME, 2000,XP
VST compatible host application

Channel Layouts: Mono
Stereo

You should uninstall the Neodynium demo from your computer before proceeding with the installation of the full version. Having the demo and full version both installed confuses some VST hosts. To uninstall the demo, use Add/Remove Programs under the Windows Control Panel.

Once you have uninstalled the demo, double click the installer and follow the prompts to complete installation of the full version.

RTAS

Mac OS X

System Requirements: PowerPC G4
Mac OS X v10.2 or higher, required
Pro Tools 6 and Digidesign approved system

Channel Layouts: Mono (RTAS/AS)
Stereo (RTAS/AS)

If you have installed the demo version, you should uninstall it before installing the full version. To uninstall the demo, use the uninstaller (see **Uninstalling Neodynium***) or remove the demo from your Pro Tools plug-ins folder.*

Once you have uninstalled the demo, double click the installer and follow the prompts to complete installation of the full version.

Windows

System Requirements: Windows XP
Pro Tools 6.1 and Digidesign approved system

Channel Layouts: Mono (RTAS)
Stereo (RTAS)

If you have installed the demo version, you should uninstall it before installing the full version. To uninstall the demo, use Add/Remove Programs in the Windows Control Panel.

Once you have uninstalled the demo, double click the installer and follow the prompts to complete installation of the full version.

Uninstalling Neodynium

Audio Unit

Use the uninstaller that was installed to ~/Library/Logs.

VST

Mac OS X

Use the uninstaller that was installed to ~/Library/Logs.

Windows

Use Add/Remove Programs under the Windows Control Panel to uninstall Neodynium.

RTAS

Mac OS X

Use the uninstaller that was installed to ~/Library/Logs.

Windows

Use Add/Remove Programs under the Windows Control Panel to uninstall Neodynium.

About This Guide

This User's Guide is designed to get you up and running quickly with your software - providing all you need to know about how to use your plug-in. The first section, New Beginnings, is designed to quickly get you using Neodynium. The second section, Navigating Around Neodynium, gives you a thorough tour of the Neodynium interface. Here you will become familiar with all of the tools that make up Neodynium and the functionality each tool provides. The sections that follow give you the detail you need to realize the full potential of Neodynium. While Neodynium is designed to be very intuitive to use, we suggest you read this entire guide to ensure you are utilizing Neodynium to its fullest.

This guide is written for both Macintosh and Windows versions of Neodynium. Where a difference in functionality exists between the two operating systems, the following notation applies: `MAC [WIN]`. That is, the Windows specific command or function is placed in brackets and follows the Macintosh specific command. For example, if you gain access to certain functionality by pressing the Command (CMD) key on the Macintosh and the Control (CTRL) key on Windows, this would be written as `CMD [CTRL]`. A list of all modifier keys used appears near the end of this guide.

> **Note:** Look in boxes like this one for cautions, tips or other information you should be sure to take note of.

Gray alert boxes, like the one shown above, appear throughout the text of this manual. These boxes bring special concerns or tips to your attention. The title of the alert box indicates its intent. You may see alert boxes with the following titles:

Caution:	Warns of potential damage to your hardware, software, audio, or ears
Note:	Important notes or considerations regarding the functionality of Neodynium
Tip:	Ideas or suggestions for using Neodynium

Understanding Neodynium

Neodynium is a whole new chapter in dynamics processing so it is quite normal if it feels unfamiliar to you. However, Neodynium should be trivially easy to use if you understand the basic concept of compression and you accept that the information and tools provided may not directly relate to anything you have seen before. In general, to reduce the chance of confusion, you should try not to get caught up likening Neodynium to other compressors or dynamics processors. There is no real comparison - Neodynium is a completely different beast.

The sections below have been provided to help you understand Neodynium's approach to compression, so you can quickly get up to speed. After making a few initial points, we dive into a tutorial, of sorts, on compression. This tutorial is recommended even if you already have knowledge of compressors - there is almost certainly something to be gained. The information in the tutorial is reinforced with the help of a few key illustrations. Finally, after completing the tutorial on compression, we take some time to explain why Neodynium is special.

Though Neodynium is really a dynamics processor in that it can expand or compress your audio, for simplicity, we'll usually refer to it as a compressor.

What Neodynium Is Not

The first step to understanding Neodynium is understanding what it is not. First and foremost, Neodynium is not a multi-band compressor nor is it intended to take the place of one. Failing to understand the difference between Neodynium's use and a multi-band compressor's use will almost certainly lead to confusion. Unlike a multi-band compressor, Neodynium *does not* allow you to break your audio up into separate frequency bands so you can apply different compression settings to each band. Neodynium is more related to the general compressors you use most each day.

Neodynium is not a multi-band compressor.

What Neodynium Is

Neodynium is a graphic, multi-regional, dynamics processor. That's right, it's a graphic multi-regional dynamics processor. You don't really need to remember that - but, you can if it makes you feel cool. Now that we know the technical term for Neodynium, let's see what it really means. There are two primary things that make Neodynium very much different from other dynamics processors or compressors you've encountered.

1. Neodynium Is A Graphic Dynamics Processor

Unlike most other dynamics processors/compressors, Neodynium allows you to visualize the compression you are applying, providing you with vital information about how you are affecting the dynamics of your audio. Neodynium is to compression what a graphic equalizer is to equalization. In fact, we like to refer to it as a graphic dynamics processor or simply a graphic compressor. Just like a graphic EQ, in no time, using Neodynium will be second nature and you'll wonder why compression was ever represented any other way.

> Neodynium is a graphic compressor.

2. Neodynium Is Multi-Regional, It Has Zones

Neodynium allows you to break your audio *levels* into regions, so you may apply different compression settings to each region. Neodynium refers to these regions as "zones." Don't get confused by Neodynium's zones. As we've learned, Neodynium isn't a multi-band compressor. Just as you manipulate the frequency display of a graphic equalizer to affect specific audio *frequencies*, so do you manipulate Neodynium's Input/Output (I/O) Map to affect specific audio *levels*. With Neodynium you can, for example, compress and bring up things that are quieter while minimally affecting higher levels.

> Neodynium lets you affect the dynamics of different audio levels in different ways.

Neodynium is really about as intuitive as a compressor can get.

The Real Deal on Compression

It seems that someone is always writing about compressors being used incorrectly. This is probably because compressors are not completely understood. At its most basic, compression

is not difficult to understand. However, making full and proper use of a traditional compressor, because of the terminology and representation, usually requires a real comprehension of what a compressor can do and is doing to your audio. This latter portion is where most compressors, and consequently, compressor users come up short. How this happens is easy to understand: most compressors simply do not provide enough information for a user to make intelligent choices about their compressor settings. Just as a graphic equalizer provides detailed information about an EQ, Neodynium provides this information for compression - and the insight provided is just as, if not more, valuable.

To help you understand Neodynium, we'll first explain compression. Don't be tempted to skip this section because you already understand compression. Understanding the concept of compression as presented here will make it much easier to understand Neodynium and all it can do for you. So, put everything you know about compression to the side for a bit and follow along. If you really feel like you have a good grasp of compression, and insist on moving ahead, go on and skip to the illustrations and accompanying text. If that sounds Greek (and you aren't) then come back and start from here.

What is compression, really?

Though it may not always be clear, when we speak of compression we are actually referring to the act of squeezing a specific range of audio levels to fit into a smaller range. That may sound like a strange explanation of compression because it is often the tendency to view compression as simply pressing levels down. But, this is a potentially limiting view that may lead to an incomplete understanding of compression.

It bears repeating, compression is the act of squeezing (compressing) a specific range of audio levels to fit into a smaller range. You tell a compressor what audio to squeeze by specifying a threshold. All audio above the threshold level will be compressed. Because audio levels typically go up to 0 dB, all audio between your threshold on up to 0 dB is compressed - this is the range to be compressed. How much the audio in the range will be squeezed, or compressed, is determined by specifying the ratio. Note: We'll ignore attack and release for the time being because considering these settings now would only serve to complicate things unnecessarily. The meat and potatoes of compression are the threshold and the ratio. Once you fully understand those concepts, understanding attack and release should be relatively easy.

Compression is squeezing something into a smaller space or range.

Compressor Threshold

As we understand, a compressor squeezes a certain range of audio levels into a smaller range. For almost all compressors, the top of this range is assumed to be the maximum level of your audio (in digital systems, this is commonly 0 dB). The bottom of this range, or the minimum level of audio that will be compressed is the compressor threshold. The threshold indicates the level at which you want the compressor to start compressing.

To put all that in simpler terms, the compressor will look at your input audio level and if the level is above the threshold you have set, reduce the audio level based on your compressor ratio setting. It is important to understand that for input levels below the threshold, the output level will be the same as the input level (unchanged). However, for input levels above the threshold all the way up to 0 dB, the output will have a different level than the input. Exactly how much your output level differs from your input level will always depend on both your threshold and your ratio settings (and your attack and release settings, which we'll discuss later).

The threshold is the point at which compression should begin. Levels above the threshold are compressed.

Compressor Ratio

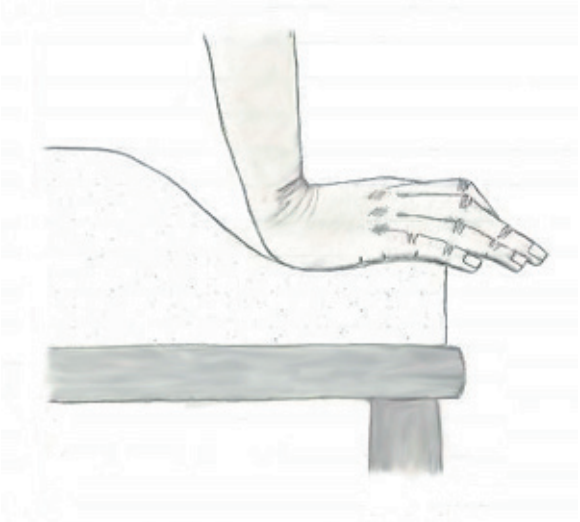
Ratio, usually expressed as X:1 where X is a number, is used to specify the relationship between your input and your output, that is, how much you will be compressing your input. X represents the input and 1 represents the output. If you're familiar with ratios, you may already understand that X:1 means the input should be X times as large as the output. To some that may seem to be a bit of a convoluted view. Since what we're really interested in is how much smaller the compressor will make the output compared to the input, it may be more clear to think in those terms. In that case, using simple math we can see that if X:1 tells us that the input should be X times as large as the output, this also means that the output will be 1/X times as large as the input

Throughout this section, we'll use the traditional X:1 notation, however we'll reference it using the latter view (i.e. we are making the output 1/X times as large as our input) rather than the more traditional view (our input is X times as large as our output). This is another important concept to understand and accept: If you specify a ratio of X:1 you are stating that you want the compressor to make the input audio levels above your threshold take up 1/X as much space.

A ratio of X:1 means your output levels should take up 1/X as much space as your input levels.

General Compression Analogy

If you find compression hard to grasp, consider the analogy of a cushion on a hard chair. The cushion represents your audio levels. The top of the cushion is your maximum audio level, when uncompressed this would typically be 0 dB. Two things will determine how much the cushion will be compressed: your hand and the chair. The chair is your threshold, the solid surface against which all compressing must be done. Only the area above the chair (the actual cushion) can be compressed. Your hand acts as the ratio control, determining how much the cushion will be pressed. By pressing down on the cushion you make it fit into a smaller and smaller space (or range), thus bringing down your maximum audio level (which is still the top of the cushion). At any point, the space that the compressed cushion has been fit into is determined by the chair (the threshold) on one side and limited by your hand (the ratio control) on the other.

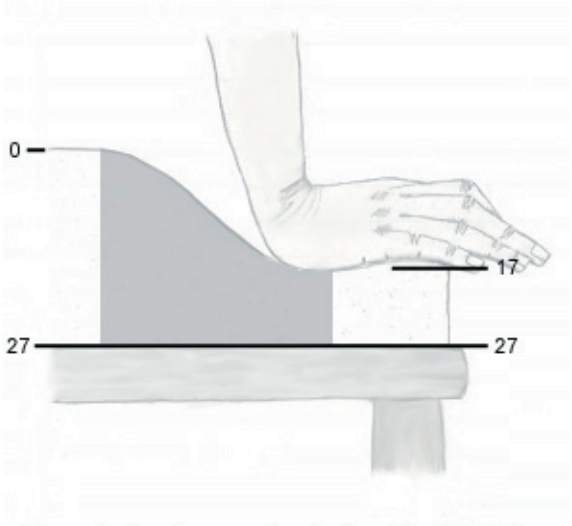


Example: Hand compressing chair cushion

Neodynium Redux

Now that we have a basic understanding of compression concepts, let's take a moment for an overview of Neodynium and how it presents compression. Imagine you are compressing with the following settings: (1) a threshold of -27, and (2) a ratio of 2.6:1. For most of us those settings alone don't conjure up a clear picture of what is actually happening. For example, with only that information, we do not know immediately: How much space are we compressing into? How far down have we pressed? But, let's imagine this compression in relation to the cushion analogy introduced previously. If, as in the illustration that follows, we can see the cushion being compressed, and compare the compressed state to the uncompressed state, we have a very good grasp of what is going on. We know how much compression is being applied, and we know how much space we are compressing into - answers we were previously missing. This is exactly the information Neodynium provides for you about your audio levels. Just as seeing the chair illustration helps you understand the real effect of the compression settings, so does Neodynium.

Let's look at the chair cushion illustration again and compare it to Neodynium. While the illustration already tells us much more about the compression taking place than the numbers alone, it is even more helpful with our threshold and other levels clearly marked. For this reason, we've added a small scale along the left and right sides of our cushion illustration. Placed next



Example: Hand compressing chair cushion (detailed)

Example: Neodynium with same compression

to the cushion illustration is a picture of Neodynium with similar threshold and ratio settings. As you can see, the two pictures are quite similar.

To compare, if we go back to our original question, when we are told we have a threshold of -27 and a ratio of 2.6:1, we're still left without a lot of key information. However, by looking at Neodynium we can immediately see that we are compressing into about 10 dB of space (27 dB -17 dB). We can also see the we have pressed our levels down by about 17 dB (0 dB to -17 dB) and that our output audio will have a maximum level of about -17 dB. Additionally, because Neodynium provides a graphical picture showing our pre- and post- compression settings, we can easily see the relative effect of our compression - how high the new level is in comparison to what it was originally. These are important bits of information that are, for the most part, completely missing from most traditional compressors.

With a traditional compressor you are essentially shooting in the dark. However, with Neodynium you get a clear and concise picture of the compression taking place, enabling you to make intelligent choices about how you affect the dynamics of your audio.

Time For An Example

Let's consider a concrete compression case. If you specify a threshold of -20 dB and a ratio of 4:1, you are telling the compressor that all audio above -20 dB (or, more completely, audio levels between -20 dB and 0 dB), should be compressed at a ratio of 4:1. But what does that really mean? As we stated earlier, compression is the act of squeezing audio levels to fit into a smaller space or range. When you set a ratio of 4:1 you are instructing the compressor to squeeze the audio levels above your threshold so they fit into 1/4th of the space. In our example with a threshold of -20 dB, we are, again, affecting the audio levels from -20 dB on up to 0 dB - a range of 20 dB (0 minus -20 dB is 20 dB). With a ratio setting of 4:1, the compressor will make this audio with a range of 20 dB now have a range that is 1/4th as large, or 5 dB (one-fourth of 20 is 5). In other words, audio levels that were previously between -20 dB and 0 dB, our 20 dB range, will now be squeezed to fit into a 5 dB range. Instead of ranging from -20 dB to 0 dB the compressor will make the audio levels range from -20 dB to -15 dB (5 dB above -20 dB). Keep this example in mind, we'll continue to visit it again and again, throughout the Understanding Neodynium section.

If you're very quick with math, you might have already figured out that you can use this same concept to determine how much above the threshold the output will be for any input level. Remember, if the input audio level is below the threshold, -20 dB in our example, we'll always get the same thing out as we put in. For example, if the input level was -21 dB, the output would be -21 dB; if the input was -45 dB, the output would be -45 dB. However, when the input level is above the threshold, the output level will differ. If the input level is 10 dB above the threshold,

the output level will be 1/4 (one-fourth) of 10 dB above the threshold level, or 2.5 dB above the threshold (one-fourth of 10 dB is 2.5 dB). If the input level is 15 dB above the threshold level, the output level will then be 1/4 (one-fourth) of 15 dB above the threshold level, or 3.75 dB above the threshold (one-fourth of 15 dB is 3.75 dB) and so on, and so forth. If you're using Neodynium, you shouldn't need to figure this out yourself.

What Are you Talking About

Some of what you've read thus far may sound unfamiliar or may seem to be a completely alien view of compression, but it should not because it is the most basic essence of compressor operation. If you've gotten lost somewhere along the way and are no longer following, you may want to go back and re-read the last few sections before moving ahead. When you're ready, forward ho...

A Picture Is Worth A Thousand Words

Let's walk through a few illustrations to help cement the concepts we've discussed thus far. To get the most from these illustrations, you should consider them in order.

Illustration 1: Typical Input & Output Meters

Depicts typical input and output meters. When these meters are side by side as shown, it gives a good indication of how the input and output levels compare. For example, if the input meter was consistently around -3 dB, but the output meter was down around -9 dB, you would come to the correct conclusion that your audio levels had been reduced. As you might see in a typical meter, the meters in our example have colored ranges. Areas below -40 dB are green, areas up to -20 dB are yellow and areas above -20 dB are orange. Keep in mind that like your audio levels, meters are constantly moving so these pictures are only a snapshot of what is happening at a particular instance of time.

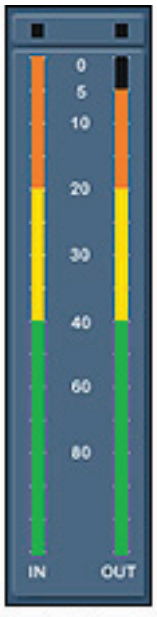


Illustration **1A**

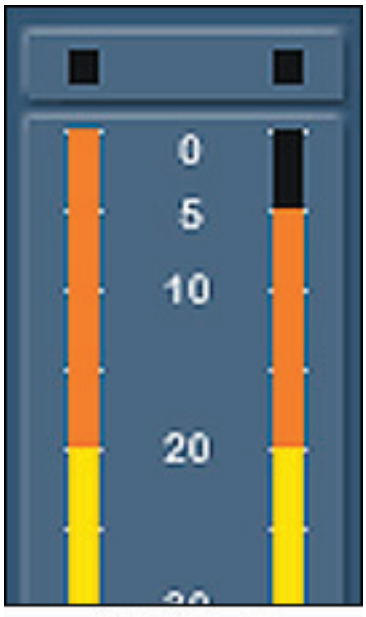


Illustration **1B**

Illustration 2: Compression Example Meters

Illustrations 2A-D are not related to Illustration 1, but utilize similar input and output meters. The input meter remains on the left side and the output meter remains on the right side.

These illustrations depict input and output meters as we might find them in the example we introduced previously. Recall that our example involved a compression ratio of 4:1 and a threshold of -20 dB.

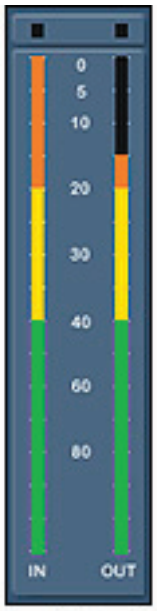


Illustration **2A**

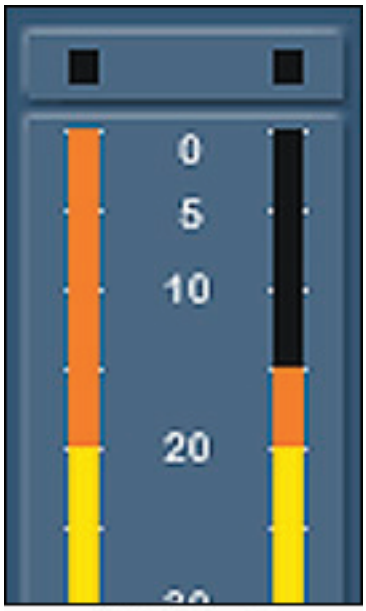


Illustration **2B**

Illustration 2A

Shows a full view of the input and output meters as we would find them if our input was at 0 dB. Note that the left, input meter is showing a level of 0 dB.

Illustration 2B

Shows a close up of the input and output meters shown in Illustration 2A. Again, the levels depicted are what we would see if our current input level was 0 dB. In this image, we can focus on the range -20 dB and above. Remember, our example threshold is -20 dB so audio levels below -20 dB will not be affected by the compressor.

Illustration 2C

Shows the same close up found in Illustration 2B, however, important areas have been marked. This picture is the heart of our example. A solid black line on both the input and output meters at -20 dB, indicates our threshold setting of -20 dB. As noted, because this is our threshold, only input audio levels above that line will be affected by the compressor. The input meter is shaded above -20 dB to reinforce this understanding. Again, all audio levels at (and below) the threshold are unchanged. As an example, if the input audio level was -21 dB (which is below our threshold of -20 dB), the compressor would not affect the level at all and, accordingly, the output would be -21 dB.

As discussed previously, with a ratio setting of 4:1, we are instructing the compressor to squeeze the audio between our threshold and 0 dB into an area that is 1/4th as large. Because the input area to be affected is from -20 dB up to 0 dB, a 20 dB range, the

compressor must squeeze the 20 dB range of audio levels to fit into 1/4th of 20 dB, or a 5 dB, range. Where our input had a maximum of 0 dB, our output will have a maximum of -15 dB (from -20 dB up to -15 dB gives us the 5 dB range). A dotted white line depicts this relationship, illustrating how our maximum input of 0 dB will correspond to a maximum output of -15 dB in our example.

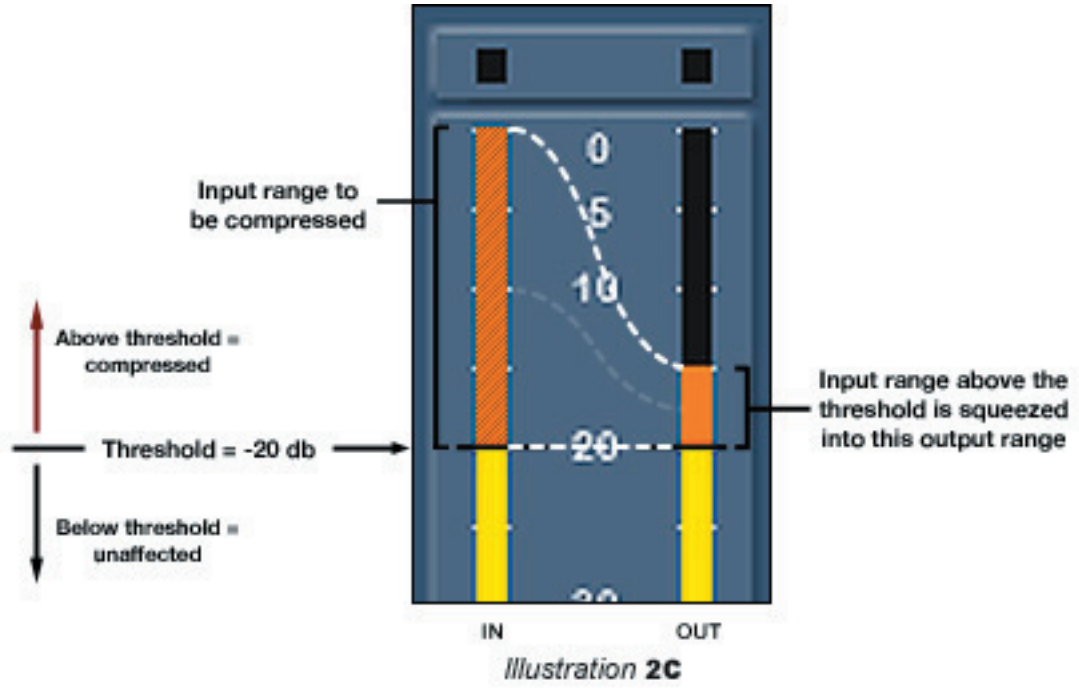


Illustration **2C**

If you understand what is shown in Illustration 2C, than you understand Neodynium's I/O Map. Neodynium simply creates this same overview picture for you, showing how your input and output relate, what levels you are compressing and how much you are asking for those levels to be compressed.

Illustration 2D

You must keep in mind, these illustrations are only a snapshot of one instance in time. Audio levels are constantly changing. As we've stated, Illustration 2C shows what our compressor meters might look like if our input audio level was 0 dB. Our analysis showed us that our output will be -15 dB if our input is 0 dB. But what about other input levels? All input levels between -20 dB and 0 dB must be adjusted so they fit in the new range, -20 dB to -15 dB. For example, an input level of -10 dB, which is half-way between our threshold of -20 dB and our maximum input level of 0 dB, will become an

output level of -17.5 dB (half-way between our -20 dB threshold and our new maximum level of -15 dB). This is shown in Illustration 2D.

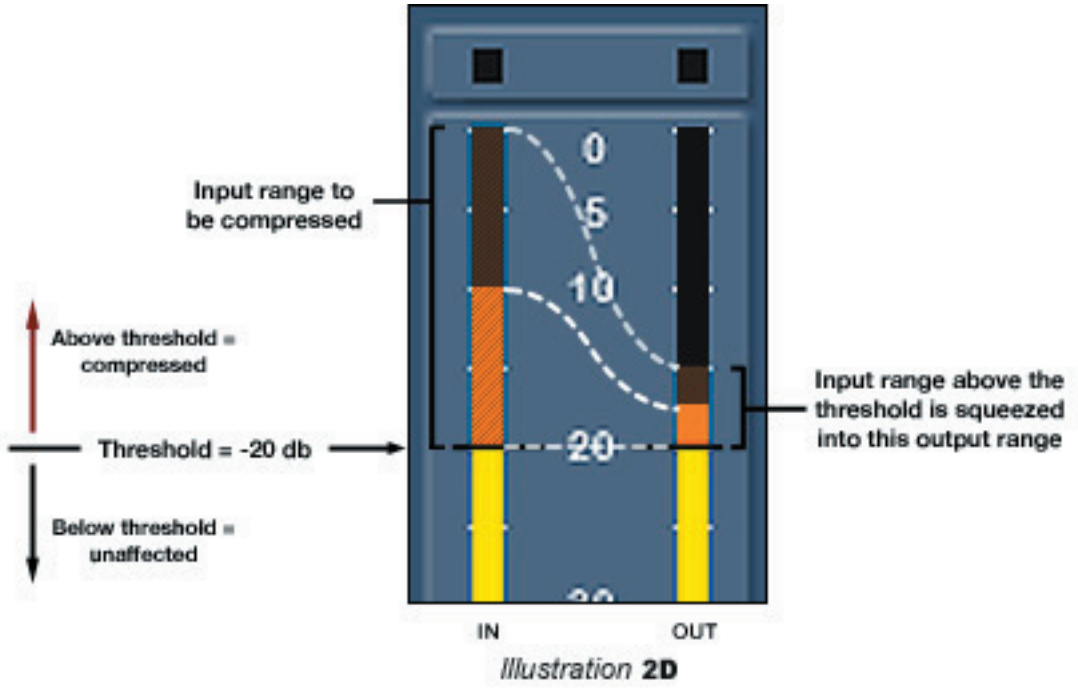


Illustration **2D**

Levels Above 0 dB

If you're really following, you might be wondering: What happens if the audio levels are above 0 dB? Well, that depends on the compressor. Many compressors will automatically compress all audio above the threshold, so levels above 0 dB will be compressed as well. If this were the case in our example, the maximum output level would exceed the -15 dB we expected for an input level of 0 dB. Determining what the exact output would be for any input level is not difficult. This procedure is described in **Understanding Neodynium: Time for An Example**.

For flexibility, Neodynium, does not automatically compress audio above 0 dB. If there is audio above 0 dB that should be compressed, Neodynium's input trim can be used to bring the input down so it doesn't exceed 0 dB and thus, will be compressed.

Where Zones Fit In

We now know that compression is the act of squeezing a range of audio levels to fit into another range. We like to refer to a range of audio levels being compressed as a *zone*. The examples and illustrations we've discussed so far have involved compressing one range of audio levels and, thus, one zone. To illustrate, in our primary example, shown in Illustration 2, we spoke of compressing audio between -20 dB up to 0 dB - this is one range of levels being compressed and hence, one zone. Though it is standard practice, we need not be limited to compressing only one range of audio levels.

There are many cases that benefit from finer compression control, utilizing different compression settings for different regions of audio levels. For example, when compressing vocals, we might like to compress the lower levels in a different way than upper levels to reduce loud peaks (high levels) while suppressing breathing noises (typically lower level). If we can specify one group of compression settings for the upper range of levels and a different group of settings for the lower range of levels, we can control the compression of these areas separately. With this ability we could elect to compress the levels in the range -20 dB up to 0 dB at a ratio of 4:1, as in our example, but compress levels in the range -40 dB up to -20 dB at a ratio of 2:1. We are then specifying two different compression ranges or zones with different compression settings. The first range spans from -20 dB up to 0 dB; the second range spans from -40 dB up to -20 dB. Neodynium provides you with this flexibility. In contrast, with a typical compressor we would be limited to applying the same compression settings (ratio, attack, and release) to both of these ranges.

Multi-band Compression

Now that we have a good understanding of basic compression, we'll go a little deeper - but, not too deep. A multi-band compressor allows you to apply different compression settings (ratio, attack, and release) to different frequency ranges, or as more commonly known, frequency bands. So, for example, you can compress the lower frequencies in a different way than you compress the high frequencies. To accomplish this, a multi-band compressor breaks your audio up into different frequency bands then applies the separate compression settings to those ranges. Because it applies individual compression settings to more than one (multi = more than one) frequency range (range = band), it is termed a multi-band compressor.

Traditional compressors, which are used most often on individual tracks, do not break up your audio into different frequency ranges like a multi-band compressor. A traditional compressor considers your audio levels without regard to the frequency. In other words, all frequencies are compressed in exactly the same way.

In these respects, Neodynium is most like a traditional compressor; it does not allow you to apply different compression settings to specified frequency bands. However, Neodynium does allow you to break your audio *levels* into different regions (zones) so you can affect the dynamics of each of these regions separately. Now you're probably saying - well that sounds like a multi-band compressor. Not quite - don't let the *zone* part confuse you. Neodynium's zones are not frequency bands and have nothing to do with frequency. Where a multi-band compressor allows you to apply different compression settings to different *frequency ranges*, Neodynium allows you to apply different compression settings to different *level regions*. In this way, Neodynium allows you to compress lower, mid and high *levels* each in a completely different manner. So, for example, you could smooth out the initial high level hit of a snare while accentuating the low level tail.

Sidechains & Filters

Some traditional compressors have built in filters on the input or sidechain which allow you to only affect certain frequency ranges or to affect some frequency ranges more than others. However, unlike a multi-band compressor, you are still unable to apply completely different compression settings to the different frequencies you've chosen to affect. Only one threshold, ratio , attack, and release are specified and these values apply to all levels that will be compressed - regardless of the actual frequency.

Compressor Attack

In practice, as it turns out, it doesn't always sound great when you move abruptly from no compression to full compression. In other words, when the compressor applies the ratio you have set as soon as your audio passes the threshold, the result is not always pleasant. Enter Attack. Attack, usually expressed in terms of seconds of time, determines how quickly the compressor will apply the ratio that you have specified. Attack allows the compressor to "ease" into your compressor ratio. The longer the attack, the longer the compressor takes to ease into the ratio. As such, if you wanted a subtle, less noticeable compression you would specify a longer attack. If you wanted a very abrupt compression you'd specify a shorter attack.

It is important to understand that, because the attack determines how long the compressor takes to apply the exact ratio you have specified, the values above your threshold cannot always be calculated as described in **Understanding Neodynium: Time for An Example**.

All the examples we've discussed have assumed no attack and no release. We refer to the value your audio levels would have if there was no attack or release being considered, the "target" audio level. Whether the actual compressor output level equals the target will depend on your attack and release settings. To help you understand how your attack settings are affecting the

compressor's ability to reach your target compression, Neodynium provides you with a key "target" meter. The key target meter indicates the level your key would have after compression *if the attack and release were ignored*. Neodynium also provides a key "processed" level meter which indicates the level your key would have after compression *if the attack and release are considered*. By comparing the key target and the key processed meters, you get a good indication of how your attack and release settings are affecting Neodynium's ability to reach your compression goals (see **Navigating Around Neodynium: Key Level Meters**, for more details).

Compressor Release

When your levels are no longer above your threshold, the compressor should not be compressing. However, as was true for starting compression, it doesn't always sound great when you stop compression abruptly, moving quickly from full compression to no compression. Release addresses this problem. Release, usually expressed as an amount of time, determines how long the compressor takes to "let go" of your audio or stop compressing. Release allows the compressor to ease out of applying your compressor ratio. The longer the Release, the longer the compressor takes to ease out of the ratio.

Release can be a difficult concept to get a handle on because its effect can be hard to hear. Failure to completely understand release and its place in compression often results in frustration with "pumping" or "breathing" effects.

It is important to understand that, because the release determines how long the compressor takes to ease out of the exact ratio you have specified, values above your threshold cannot always be determined as described in **Understanding Neodynium: Time for An Example**. Furthermore, depending on the compressor and the length of your release, values below your threshold may also be affected.

All the examples we've discussed have assumed no attack and no release. We refer to the value your audio levels would have if there was no attack or release being considered, the "target" audio level. Whether the actual compressor output level equals the target will depend on your attack and release settings. To help you understand how your attack and release settings are affecting the compressor's ability to reach your target compression, Neodynium provides you with a key "target" meter. The key target meter indicates the level your key would have after compression *if the attack and release were ignored*. Neodynium also provides a key "processed" level meter which indicates the level your key would have after compression *if the attack and release are considered*. By comparing the key target and the key processed meters, you get a good indication of how your attack and release settings are affecting Neodynium's ability to

reach your compression goals (see **Navigating Around Neodynium: Key Level Meters**, for more details).

What Makes Neodynium Special

Neodynium is much more than your average compressor, providing a wealth of features and compression insight that was previously either completely unavailable or available only in a cryptic, non intuitive form. For this reason, it may take a bit of time for you to get used to Neodynium, but the payoff is greater compression control and insight.

In this section, we'll have a brief overview of the Neodynium I/O Map to see the information that this approach provides. Then, to wrap up, we'll get a little deeper into Neodynium's zones and how they can be useful to you.

What They Won't Tell You

To describe your compression settings, a typical compressor provides only the bare minimum information: the threshold, ratio, attack and release. These values, generally the only pieces of information to clue the user in on how the dynamics of their audio will be affected, are usually found adjacent to the simple knob or slider controls used to adjust the particular setting. Neodynium, on the other hand, provides a complete picture of the compression taking place.

As indicated in the accompanying image, Neodynium tells you clearly and immediately what ranges are being compressed, how far down they are being compressed and how much space they are being compressed into. As you make adjustments, Neodynium keeps you updated as to what these values are and, as such, how you are affecting the dynamics of your audio.

There are many cases where you may want or even need this information Neodynium provides. As an example, suppose you want to compress your audio to gain about 5 dB of headroom. With Neodynium, you know immediately when you have a compression setting that produces this effect.

Utilizing Neodynium's Zones

As we've mentioned earlier, Neodynium allows you to break your audio *levels* up into regions so you may apply different compression settings to each region. We call these regions *zones*. By utilizing more than one zone, you can use Neodynium to tweak small nuances or accentuate a specific portion of your audio, achieving effects not possible with other compressors on the market today. With a traditional compressor, you are limited to one zone and one threshold. This means you cannot apply different compression settings to different levels. It also means you must affect all audio above your threshold, even if it is undesired or unnecessary. Neodynium's zones let you do away with these restrictions.

Below, we take an in depth look at one case that illustrates the value of not being restricted to one compression zone. Then, we briefly run through a few more examples that illustrate how Neodynium's zones can be useful or even indispensable.

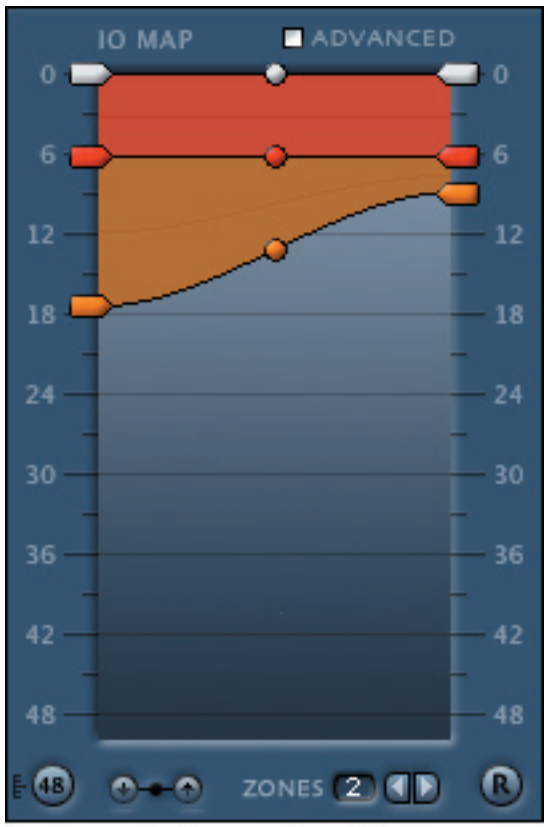
Example: Making Lower Level Sounds More Apparent

You traveled 1000 miles to record some folk musicians in a fantastic sounding room to capture the natural ambience. When you get back to the studio, you and the musicians decide that the room's natural reverb isn't apparent enough in the recording. You begin to reach for the send to add some extra ambience using a digital reverb, when the artists protest.

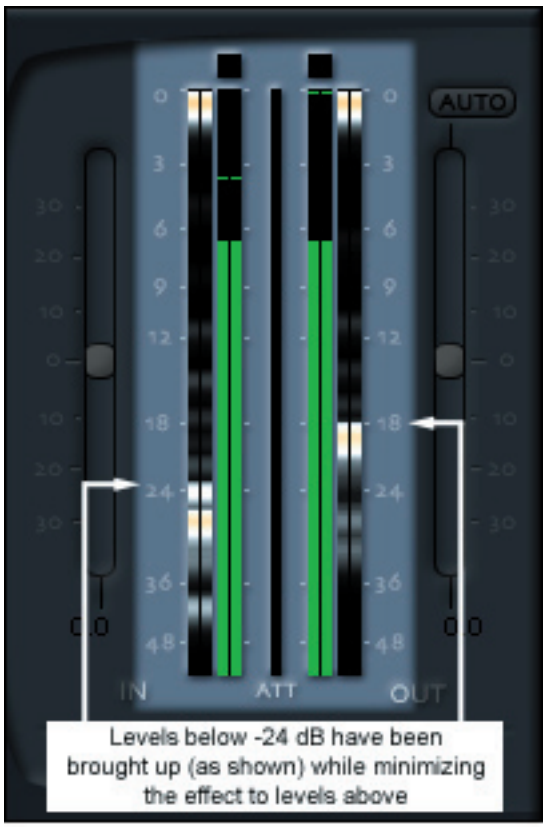
Instead you open up Neodynium. The ambience is there already, all you need to do is bring it out. After watching the cloud meters, you find some ‘space’ in the levels between -6 and -12 dB. If you can close that space a bit by bringing up everything below it, the ambience would come through while preserving most of the dynamics of the original.

You dive into the I/O Map, first setting the red zone threshold to -6 dB. Because you don’t want to change the dynamics of the audio above -6 dB, you set the red zone’s ratio to 1:1. You also set a low attack for the red zone to ensure the levels quickly achieve your 1:1 ratio.

You plan to use the orange zone to reduce some of the “space” you identified earlier. Accordingly, you set the orange zone threshold to -12 dB. You want to reduce or compress this region, to bring up the lower level audio, so you shrink the orange zone’s range of 6 dB to a range of about 3 dB - a ratio of 2:1. The levels you want to bring out still don’t sound as prominent as you’d like, so you decide to affect more input levels. You bring the orange zone threshold down to -18 dB. Your new ratio is 4:1.



Final compression setting



Cloud meters show effect of the compression

When you check out the cloud meters, you see that the lower levels that were down around -24 dB have now been brought up 6 dB, or so, to around -18 dB. This increase in the lower level provides the more ambient sound you and the artists were looking for. As the artists marvel at your work, you silently congratulate yourself for being intelligent enough to have Neodynium on hand.

Other Examples

Here are a few other cases where Neodynium's zones would be beneficial or even indispensable. Of course, there are many, many other instances where Neodynium's zones could be utilized.

Example 1

You have a drum track with a high hat that you feel is a little too low. The high hat has levels from about -35 dB up to -20 dB. You want to bring out these levels, but you want to affect the higher levels as little as possible.

Traditional Compressor: Not possible.

Neodynium: You can use two of Neodynium's zones to achieve this effect. The first zone will have a compression ratio of 1:1, or no compression. The next zone will range from -35 dB to -20 dB. With these settings, you can bring the high hat levels up while minimizing the effect to other levels.

Example 2

You have a drum track and you want to get some control over a prominent kick while bringing out the lower levels a bit more.

Traditional Compressor: It is not possible to specify different compression settings for different audio levels. All audio must have the same ratio, attack, and release. All audio will be treated the same.

Neodynium: Use two or more of Neodynium's zones. Use the first zone to control the prominent kick by specifying a moderate ratio, a quick attack, and moderate release. The remaining zones can be specified with more loose attack and release settings and ratio dependent on the desired effect.

Example 3

You want to try some special effects with a snare by compressing the initial punch and making the tail more prominent.

Traditional Compressor: It is not possible to specify different compression settings for different audio levels. All audio must have the same ratio, attack, and release. All audio will be treated the same.

Neodynium: Use two or more of Neodynium's zones. Use a moderate ratio and fast attack on the first zone to reduce the punch. Varied ratio, attack, and release settings on the remaining zones for the desired effect.

The New Answer

How can you choose the best compressor setting if you are always limited to compressing everything above a certain level? How can you quickly determine the best compressor setting if you can't tell how it will affect your output levels? How can you avoid squashing your audio if there is no real way to tell the effect of your compression?

The best compression doesn't always involve treating all levels equally - with the same ratio, attack, and release. By using Neodynium's zones, you determine the ideal compression setting without being forced to conform to the restrictions found on other compressors. And whether you are using one zone or many, by visually displaying the relationship between the input and the output, Neodynium gives you the information you need to make intelligent choices about how to affect the dynamics of your audio.

Neodynium is the new answer to compression. Before long you'll be wondering how you got along without it.

New Beginnings

Setup

Ensure Neodynium is properly installed into the appropriate location for your chosen audio processing application ("host application" or "host"). Launch your host application and open an audio file. Start Neodynium by accessing it through the appropriate menu item – check Effects or Plug-Ins or the documentation for your host application. See **Installation** earlier in this manual if you have not gone through the installation procedure or if you have trouble accessing your plug-in.

Quick Start

Neodynium was designed to be easy-to-use, however, because it is a highly visual compressor and its behavior and interface differ from more traditional compressors, it may initially be disconcerting. We'll walk through an example that will help you to understand Neodynium's interface and how using it is similar to, and different from, other compressors. To get the most from this example, you should go through it while running Neodynium.

> **Note:** This section assumes you have at least a general familiarity with, and understanding of, compression terms like: Attack, Release, Ratio and Key. If you do not, you should first read **Navigating Around Neodynium: Attack Area: A Little About Attack, Navigating Around Neodynium: Release Area: A Little About Release, Navigating Around Neodynium: Ratio Area: A Little About Ratio,** and the first paragraph of **Navigating Around Neodynium: Key**.

Let's Look Around

Before jumping into the meat of our example, we'll quickly breeze around the Neodynium interface so you can get your bearings.

Key

Neodynium has a full-featured mechanism for specifying and configuring the audio that is used to trigger its compression action. We refer to this "trigger" as the compressor's key. Controls to adjust the key occupy the greater portion of the left side of the Neodynium interface. In this area you can specify the audio to be used as your key (input channel(s), sidechain), whether Neodynium should analyze the RMS levels of your key (peak levels are analyzed by default), the amount of look-ahead, and how you want to filter your key, You will also find controls for auditioning your key. Also see **Navigating Around Neodynium: Key Area**.

Input/Output (I/O) Map

To the right of the Key area you'll find the Input/Output (I/O) Map. The I/O Map is used to directly specify the input-output relationship of your audio. Your settings here will determine how much Neodynium compresses your audio and when it starts compression. The I/O Map is broken up into adjustable, colored compression regions called Zones. You can specify a ratio, attack and release per zone.

> **Note:** The left is the input side of the I/O Map; the right is the output side. The colored controls on either side of the I/O Map are called zone flags.

Directly below the I/O Map are controls to: zoom the I/O Map, specify how changes to one zone will affect other zones, specify the number of zones you wish to use, and reset the I/O Map.

Also see **Navigating Around Neodynium: Input/Output (I/O) Map**.

Metering, Input and Output Trim, and Limiter

Neodynium's metering and Trim section are located to the right of the I/O Map. The meters and trim control for the input are located to the left side of this area. The output meters and output trim control are located to the right. Splitting these two sections is Neodynium's attenuation meter which measures the relative amount of compression of

all zones. Neodynium provides two types of input and output meters, traditional peak meters and "cloud" meters. Cloud meters give you an indication of the areas where your audio's peak levels are concentrated. Also see **Navigating Around Neodynium: Input and Output Trim** and **Navigating Around Neodynium: Meters**.

> **Note:** If you are using Neodynium in stereo, the meters are split to show levels for both the left and right channels.

At the base of the metering and trim sections is a control for specifying the type of limiting Neodynium applies: **OFF** (no limiting), **F** (fast), **M** (medium), and **S** (slow). Also see **Navigating Around Neodynium: Limiter**.

Attack, Release, and Ratio

Below the key area, I/O Map, and metering area you will find sliders to set the attack, release, and ratio of each active zone. This is a significant difference between Neodynium and more traditional compressors. Zones with separately adjustable attack, release, and ratio give you the ability to bring out subtle nuances in your audio that you may not have realized were there. You can also make more drastic changes for special effects. If you would like certain zones to have identical attack and/or release settings, you can lock the zones using the lock controls located to the left of the sliders. The zone attack and release sliders are locked by default. Also see **Navigating Around Neodynium: Attack Area**, **Navigating Around Neodynium: Release Area**, and **Navigating Around Neodynium: Ratio Area**.

> **Note:** Neodynium's Zones with individually configurable attack, release, and ratio allow you to produce subtle or drastic changes to your audio, achieving effects not possible with other compressors.

Workspaces

There are two workspaces available in Neodynium so you can compare different compression settings. Use the **A** and **B** buttons, located at the bottom of the Neodynium

interface, to switch between workspaces. Also see **Navigating Around Neodynium: Workspaces**.

Load and Save

Use the integrated **LOAD** and **SAVE** to save your current compression settings to a file and easily load it again later (in any host and with any plug-in format). Also see **Navigating Around Neodynium: SAVE and LOAD**.

Getting Your Hands Dirty

To get you started quickly, we'll consider Neodynium in the simplest case, without utilizing many of the features it offers. Because Neodynium was designed to be intuitive, after reading this section and looking over the interface, you will probably be able to make pretty good use of Neodynium, However, while Neodynium can be simple, there are a host of features that may not be readily apparent and are not found in traditional compressors. Understanding these features is critical to maximizing Neodynium's value to you. For this reason, we recommend that you read this entire User's Guide to ensure you have a complete understanding of all Neodynium features. Of course, if you don't enjoy sitting down to read a good manual (but, hey, who doesn't?), you can jump right in to Neodynium and refer to the applicable section in **Navigating Around Neodynium** when you come to an area on which you need more detailed information. Now launch Neodynium as specified in Setup, previously, and follow along.

1. Adjust the I/O Map to use two (2) zones.

At the base of the I/O Map, you will find a control labeled **ZONES**. Click the left arrow until 2 appears in the adjacent display. This will adjust the I/O Map to display the red and orange zones.

> Note how the I/O Map, attack, ratio, and release area change as you adjust the number of zones.

2. Enable I/O Map Simple mode.

The I/O Map can be operated in one of two modes: Simple and Advanced. When in Simple Mode, your interaction with Neodynium will be, in many ways, similar to a more traditional compressor. For this reason, Simple Mode is the best mode to use when becoming familiar with Neodynium. We will utilize Simple Mode in this Quick Start however, the concepts discussed are applicable to Advanced Mode, as well. Differences

between Advanced Mode and Simple Mode are described in **Navigating Around Neodynium**.

To enable Advanced Mode, you click the **ADVANCED** control at the top, right of the I/O Map. Advanced Mode is enabled when the control is white. When Advanced Mode is not enabled, the I/O Map is in Simple Mode. Ensure Advanced Mode is *not* enabled.

> Switch between Advanced and Simple Mode by toggling the **ADVANCED** control. Note how the I/O Map changes. Some controls are available in Advanced Mode that are unavailable in Simple Mode. Ensure **ADVANCED** is not enabled when you are done.

3. Set your threshold.

Drag the small red flag located on the left of the I/O Map until it is at your desired threshold, we'll use -12.0. For guidance, the threshold value of the zone currently under the mouse is displayed at the bottom, left of the I/O Map.

Adjust the orange zone's threshold to -24.0 dB.

4. Set your ratio.

In Neodynium, as in more traditional compressors, you determine the amount of compression by configuring the ratio. Unfortunately, in most traditional compressors it is not apparent, without doing a bit of math, to what output value a given input will map. However, with Neodynium, you can easily visualize and directly specify how your input will be mapped to your output.

The Ratio Area, located below the I/O Map, contains controls for adjusting the ratio of all active zones. Drag the red zone's ratio slider to a value of 2:1. Next, adjust the orange zone's ratio to 4:1. You can choose any values, these are just guides.

Note that when in Simple Mode, Neodynium always achieves compression by bringing levels down. When in Advanced Mode, you have complete freedom over how Neodynium's compression is achieved.

Try using different ratio settings and note how the I/O Map changes. The I/O Map always gives you an accurate picture of how your input and output relate.

Drag the gray flag located at the top, right corner of the I/O Map to adjust the levels to which your inputs are mapped. This is similar to, but more direct than, using the Output Trim.

5. Attack, release.

Use the red zone attack and release sliders, located to the bottom right and bottom left sides of the Neodynium interface, to adjust the attack and release to desirable values. By default, the attack and release are locked so they are adjusted in tandem.

Click the white circle adjacent to the red or orange zone's attack and/or release sliders. You can now adjust them separately. By utilizing separate attack and release values per zone, you can achieve effects not possible with other compressors.

6. A little limiting and we're done.

Visit the Limiter controls. The controls, from left to right, **F**, **M**, **S**, determine how quickly Neodynium's limiter responds. Select **OFF** to disable the limiter. While you're in the area you might also want to adjust your output trim.

As stated earlier in this section, these general concepts can be applied in Simple Mode or Advanced Mode. However, where Simple Mode handles many aspects of your compression automatically for you, Advanced Mode allows you to directly specify and control these aspects. For example, when you adjust your threshold while in Simple Mode, Neodynium makes adjustments as necessary so the ratios of all zones remain unchanged. This helps you quickly achieve desirable results, but may be limiting if you know exactly how you want to accomplish your compression. In Advanced Mode these automatic adjustments are not made for you. See **Navigating Around Neodynium: Zones : Input Threshold** for more details. The

differences between Simple Mode and Advanced Mode are explained throughout **Navigating Around Neodynium**.

While this was a simple example, it gives you a good idea of how you'll use Neodynium to compress your audio. The same principles introduced here are applicable whether you are using two or more zones. This Quick Start has just touched on the basic compression functionality Neodynium provides. However, there are a host of valuable features you should become familiar with to get the most from Neodynium. At minimum, you'll want to read up on additional concepts like Key Level Meters (see **Navigating Around Neodynium: Key: Key Level Meters**) and Zone Linking (see **Navigating Around Neodynium: Zones: Zone Linking**).

Navigating Around Neodynium

This section explores every facet of the Neodynium interface, providing an in-depth look at the functionality each area provides. Consult this area of the user's guide if you have any questions about the operation of any portion of Neodynium's user interface. Of course, we recommend reading this section through at least once to ensure you are getting the most from your plug-in.

Input/Output (I/O) Map

The heart of Neodynium, the I/O Map occupies the entire center of the interface. The I/O Map is an interactive visualization of the input-to-output relationship of your audio's levels. You will spend a large portion of your time adjusting the controls found along the left and right sides of the I/O Map to configure Neodynium's compression behavior.

Advanced Mode

To suit your individual preferences, Neodynium's I/O Map may be operated in one of two modes: Simple Mode and Advanced Mode. You select the mode of operation by toggling the box at the top, right of the I/O Map, labeled **ADVANCED**. When the box is white, the I/O Map is in **ADVANCED** mode. By default, the I/O Map is in Simple Mode.

Simple Mode may be the easiest way for you to get familiar with Neodynium. When in Simple Mode, you adjust only parameters like those you may have seen on a more traditional compressor: threshold, ratio, attack and release (however, Neodynium has one of each of these parameters for each active zone). In addition to those parameters, Advanced Mode allows you to: control the output of a zone, use drag nodes to change a zone's input threshold and output simultaneously, and use Zone Linking to control how changes to one zone will affect other zones.

Differences in functionality between Simple Mode and Advanced Mode are indicated, where applicable, in the sections that follow.

Scale

The scale running along the left and right side of the I/O Map is your guide to mapping a given input level to a desired output level. By default, the scale runs from 0 to -48 dB. However, the scale changes depending upon the setting of the Scale Control (see **Input/Output (I/O) Map: Scale Control**). Toggling the Scale Control adjusts the I/O map scale to run from 0 to -24 dB, 0 to -48 dB, or 0 to -80 dB. By convention, the negative (-) sign is omitted for all values.

Zones

The I/O Map consists of up to four compression zones (Zones), each with its own attack, release and compression ratio. Because each zone is individually configurable, you can produce subtle or complex changes in your audio. Of course, Neodynium gives you the ability to adjust the

number of zones, from one (1) to four (4), to suit your specific needs (see **I/O Map: Zone Number**). One zone is analogous to a basic compressor.

A zone is depicted by a colored area in the I/O Map. For distinction and ease of use, the four Zones are colored (from bottom to top) : green, yellow, orange, and red.

We usually think of compression in terms of where we would like the compression to begin. In keeping with this view, Neodynium is laid out in such a way that the "beginning" of a zone is toward the bottom (lower levels are toward the bottom, as is the case for most meters). This means, to avoid confusion, the I/O Map should be viewed from bottom to top and not from top to bottom.

I/O Lines

The beginning, or threshold, of a zone is delineated by a black line, or I/O Line, with a small correspondingly colored flag on the left (input flag). When the I/O Map is in **ADVANCED** mode, in addition to the input flag, each zone has a corresponding flag on the right (output flag), and a small circle (drag node) in the center. The maximum input and output levels for compression are determined by the setting of the Max I/O Line, the uppermost I/O line (also see **Max I/O Line** later in this section).

While a zone's beginning is clearly indicated by the I/O Line and its correspondingly colored input and output flags, this is not so for the zone's ending. Why? Just as input levels are continuous, so are the Zones of the I/O Map. One zone's ending is also the beginning of the next zone. Therefore, changes to one zone will virtually always affect other zones (e.g. if you adjust the beginning of the red zone, you are also changing the end of the orange zone). Whether and how adjustments to one zone affects other zones is determined by Zone Linking (see **Zone Linking**, later in the section). This may all sound quite complex and interdependent, but once you start playing with Neodynium, you'll see that it is quite simple.

Input Threshold

A zone's input threshold (or more simply, input or threshold) setting determines at what input level the zone's ratio, attack, and release will apply. Each zone's input threshold setting is indicated by the correspondingly colored flag on the input/left side of the I/O Map. For example, the green zone's input threshold setting is determined and adjusted using the green flag control on the left side of the I/O Map. To adjust a zone's input threshold setting, drag the corresponding flag control up or down. To aid in adjustment,

when you mouse over an input flag, the zone's input (and output) settings are displayed at the bottom left (and right) of the I/O Map.

> **Note**: The terms "input threshold", "input", and "threshold" are used interchangeably in this guide.

Simple Mode

When you adjust the input threshold of a zone, the ratio and input threshold of all other zones are automatically maintained. The output level of one or more zones may change to compensate for your adjustments.

Advanced Mode

Adjusting the input threshold of a zone only, will change the ratio of the zone and, possibly, adjacent zones. To maintain the ratio of a zone, other zones must be shifted to adjust for the range lost or gained by the adjusted zone. In this and in other cases, it may be desirable to adjust the inputs of certain zones together. Whether and in what manner other zones are affected when you adjust the input threshold of a zone is determined by your Zone Linking settings (see **Zone Linking** later in this section).

> **Tip**: Adjusting only a zone's input threshold or output will affect its ratio. If you wish to adjust a zone's input threshold or output only, without changing its ratio, you'll need to use Zone Linking to shift other zones accordingly (see **Zone Linking**, later in this section).

Output (Advanced Mode Only)

> **Note:** A zone's output settings may only be adjusted directly when the I/O Map is in Advanced Mode. When in Simple Mode, output settings are made automatically and cannot be manually adjusted.

As with a zone's input, a zone's output setting is determined by the setting of the correspondingly colored flag on the output/right side of the I/O Map. For example, the green zone's output setting is determined and adjusted using the green flag control on the right side of the I/O Map. To adjust a zone's output setting, drag the corresponding flag up or down. When you click on or mouse over an output flag, the zone's input and output settings are displayed at the bottom of the I/O Map. Whether and in what manner other zones are affected when you adjust the output of a zone is determined by your Zone Linking settings (see **Zone Linking** later in this section).

Adjusting a zone's output is one way to determine its ratio (note that the zone's ratio display changes in the Ratio Area, see **Ratio Area** later in this guide). However, changes to one zone's output will also affect the ratio of adjacent zones. This happens because another zone must be extended or condensed to fit the new space when one zone is adjusted. For more on Zone Ratio, keep reading.

Ratio

Neodynium's I/O Map allows you to truly visualize how your audio is being compressed. By observing the relationship (or "ratio") between the height of the input side of a zone and the height of the output side, you get a clear picture of how much compression is being applied to your audio. For example, if the red zone is very wide on the left side, but is very narrow on the right side (a large ratio of input to output), the Zone is applying a lot of compression to the audio. Conversely, if a zone is very narrow on the input side, but wide on the output side, you are expanding your audio - mapping a smaller range of levels to a larger range.

Note: Neodynium allows you to compress up to a maximum of 40:1 or a minimum of 0.5:1. As an indicator, a zone will become hashed when one of these limits has been reached.

Neodynium supports a maximum (compression) ratio of 40:1 and a minimum (expansion) ratio of 0.5:1. Though these limits are strictly enforced when using the ratio sliders, when using the I/O Map you may reach ratio values outside of this range. The I/O Map is intentionally not as restrictive to make quick adjustments easier. However, we do not recommend using ratios outside the working maximum (40:1) and minimum (0.5:1).

Max I/O Line

The Max I/O Line borders, and also specifies the end of, the red zone. The maximum input level, indicated by the white flag on the left side of the Max I/O Line, specifies the level at which input levels start to map at a 1:1 ratio - in other words, no compression or expansion. The maximum output level is indicated by the white (Advanced Mode) or gray (Simple Mode) flag on the right side of the Max I/O Line. The maximum output level denotes the level at which audio at the maximum input level will appear at the output. You can think of the Max I/O line as the beginning of another zone with a fixed ratio of 1:1.

Note that it is not guaranteed that your output will never exceed the maximum output level as indicated by the Max I/O Line. Many factors, including your attack and release settings, will determined whether your output exceeds this level. You can enable the Auto-Limiter if you want to ensure your audio does not exceed 0 dB (see **Navigating Around Neodynium: Auto-Limiter**).

Simple Mode

Adjust your maximum input level by adjusting the white flag located on the left side of the Max I/O Line. Modifying the gray flag located on the right, output side, of the Max I/O Line adjusts all zone outputs in tandem. All zone ratios will remain the same.

Advanced Mode

Adjust your maximum input and output levels by adjusting the white flags located on the left and right side, respectively. As with other I/O Lines, you may also make adjustments using the drag node.

Usage: Traditional or New-fangled

Neodynium's flexibility means it can be used in the way that works best for you. For example, if you want to increase the loudness of a track you can do it in two ways:

> *Traditional:* You can compress the track by bringing levels down and compensating with make-up gain using the output gain slider (see **Output Gain** later in this guide). This is the method employed when the I/O Map is in Simple Mode. If you wish to use this approach when in Advanced Mode, you will almost certainly wish to use Zone Linking (Up) to achieve your desired results. When using this method to compress a zone, you'll bring down the output flag of the zone above.
>
> *Non-traditional or New-fangled:* You can think of the problem in terms of what you actually want to do: bring *up* the overall levels. With this method, you can directly fit your audio levels to the levels where you want them to be - without make-up gain. To use this method you only need to adjust the I/O Map so it reflects that you are actually boosting the audio (in addition to compressing it) instead of bringing it down, as it would, in general, when using the traditional approach. Using this method, to compress a zone, you'd adjust its output closer to the output of the zone above.

Of course, Neodynium's usefulness is not limited to boosting the overall loudness of your audio. This is just the simplest and most direct example to illustrate the different ways you may approach compression when using Neodynium. The concepts described are equally applicable whether you are trying to increase the loudness of a track or you are trying to control some other aspect of your audio.

While it may be your inclination to work using only one of the methods above, there is no reason the methods cannot be used together. It is perfectly feasible to bring down the level of one zone, but bring up the level of another zone. As well, using both methods may enable you to produce effects not otherwise possible.

The following example helps to illustrate the differences between the traditional and non-traditional approach.

A Simple Example: Drum Track

This example will help to cement some of the Zone concepts discussed thus far. This example assumes the I/O Map is in Advanced Mode.

Let's assume the following: We're compressing a drum track that includes kick, snare, and high hat. The high hat is around -24 to -30 dB and we want to bring it out a bit more in the

track. We might set up Neodynium as follows. This example assumes that all zones are currently flat (no compression).

1. We'll use the green, bottommost zone for our task. Because we want to start compressing at around -30 dB, we need the input threshold of our zone set to -30 dB. Since we haven't decided on how much compression we want, we'll bring the entire zone to -30 dB (both input and output) by dragging the green zone's drag node - the small green circle between the zone's input flag and output flag (see **Drag Nodes** later in this section for details on their use). If another zone is in the way, we can move it by dragging its drag node.
2. Next, because we want to limit our compression to the range of the high hat (-24 to -30 dB), we bring the next zone (yellow) down to the -24 dB level. To do this, we drag the yellow zone's drag node until the input and output are set to -24 dB.
3. Now we get to try some compression:

Non-traditional Method: Since we want to make this zone's levels more prominent in our track, we can simply adjust the output level of the green zone to a higher, more desirable level. For example, if we want our input of -30 dB brought up to -26 dB, we'd adjust the green zone's output level to -26 dB (a 3:1 ratio).

Traditional Method: We'll bring down the levels above -24 dB to achieve our compression. To bring down all levels above 24 dB, we'll enable Zone Linking (Up). Enable Zone Linking (Up) by pressing the small up arrow underneath, and to the left side of the I/O Map. Next, we'll drag the yellow zone's output flag down until the green zone is compressed as desired. Finally, we'll need to visit the Output Trim control, located on the far right side of the Neodynium interface, to make-up for our reduction. See **Zone Linking**, later in this section for more on Zone Linking (Up). See **Navigating Around Neodynium: Input and Output Trim** for more on using the Output Trim Control.

Drag Nodes (Advanced Mode Only)

> **Note**: Drag nodes are only applicable when Advanced Mode is enabled. When you adjust the input threshold of a zone and Simple Mode is active, output adjustments are made automatically as necessary to maintain the ratio of all zones.

At some point when using Neodynium, you may wish to adjust the input and output level of a zone while maintaining the zone's ratio. Drag Nodes to the rescue! Drag nodes can be

found in the center of the black, I/O line that connects a zone's input flag to its output flag. To adjust the levels at which a zone applies (both input and output), click on a drag node and, you guessed it - drag. By default, if you do not have any zone linking enabled (see **Zone Linking** later in this section), dragging a zone will adjust the input and output such that the ratio is unchanged. However, if zone linking is enabled, the action of drag nodes is changed:

If *Zone Linking (Down)* is enabled: All zones below are shifted. No ratios are changed.

If *Zone Linking (Up)* is enabled: All zones above are shifted. The current zone's ratio and the ratio of all zones above are not changed. The ratio of the zone below the dragged zone may change.

If both *Zone Linking (Down)* and *Zone Linking (Up)* are enabled: All zones are shifted. No ratios are changed.

If zone linking is not enabled: The ratio of the dragged zone is maintained. The zone below is adjusted accordingly.

Zone Linking (Advanced Mode Only)

It cannot be emphasized enough - while zone parameters like attack and release may be adjusted individually, zones do not operate in a vacuum. Changes to a zone's input, output, or ratio will virtually always affect other zones. This is not a limitation of Neodynium, but inherent in respecting the continuity of audio levels. Zone Linking provides you with a way to specify how other zones will be affected when you adjust a zone (input, output, or both using a drag node). Zones can be linked up, down or both:

Zone Linking (Down)

The dragged zones input, output, or both (depending on the control used) and zones below are shifted in tandem. Shifting only a zone's input or output without moving the zone above by a corresponding amount results in a change in the zone's ratio. As such, when using Zone Linking (Down), the ratio of the dragged zone is changed. Because all zones below are shifted by a similar amount, there is no change to the ratio of those zones.

Zone Linking (Up)

The dragged zones input, output, or both (depending on the control used) and zones above are shifted in tandem. Shifting only a zone's input or output usually results in a change in the zone's ratio. However, in the case of Zone Linking (Up), because the zone(s) above are also shifted by the same amount, there is no change to the ratio of the dragged zone (or those above). However, the ratio of the zone below will change.

Both Zone Linking (Up) and Zone Linking (Down)

The input, output, or both of all zones are shifted in tandem. All ratios remain the same.

> **Note:** When using Zone Linking, your movements are still limited by the minimum and maximum reachable zone input and output levels and the minimum and maximum allowable compression ratios.

Zone linking applies when dragging any zone control: input flag, output flag, or drag node. You should keep in mind that when you are using Zone Linking, your movements will be limited by the minimum and maximum reachable levels. In other words, the amount you will be able to move will be determined by how far the input/output of the Max I/O Line is from the maximum level (0 dB) and how far the input/output of the green zone is from the minimum level (-80 dB). For example, assume the output of the Max I/O Line is at 0 dB and you are using Zone Linking (Up). If you attempt to drag the output of any zone upward, no movement will be permitted because no movement is possible that will respect the ratio of all above zones.

Key Level Meters

Small white arrows can be found moving along the right and left side of the I/O Map. These are the Key Level Meters. See **Navigating Around Neodynium: Key: Key Level Meters** for more details.

Scale Control

Located outside the bottom left corner of the I/O map, the I/O Map scale control determines what range of levels is visible in the I/O Map. Toggling the Scale Control adjusts the I/O map to run from 0 to -24 dB, 0 to -48 dB, or 0 to -80 dB. As it is toggled, the scale control displays the lowest I/O Map plot value for the current setting e.g. when the I/O Map runs from 0 to -48, the Scale Control displays 48. If you are only working in the upper range of levels, you will probably want to set the I/O Map to run from 0 to -24 dB. This will give you a little more control when working in the upper range of levels.

By default, the range of the I/O Map runs from 0 to -48 dB. When you toggle the scale control, your zones may appear to expand or compress, however, there is no change to actual the input, output, or ratio values of your zones. Also, depending on their location, some zones may no longer be visible, or may only be partially visible.

Tip: You will have finest control of your input and output settings when the I/O Map displays the smallest range, i.e. when the scale control is set to -24.

Tip: Depending on the setting of the scale control, you may not be able to see and adjust all zones. Toggle the scale control to show the maximum range (0 to -80) to see all active zones.

Zone Linking (Advanced Mode Only)

Located to the right of the Scale control, the zone linking control determines how changes to one zone will affect adjacent zones. For more on Zone Linking, see **I/O Map: Zones: Zone Linking**.

Zone Number

Located below the I/O Map, to the right of the Zone Linking control, the Zone Number control is used to set the number of active zones. Press the arrows to the right to increase and to the left to decrease the number of zones. Neodynium allows a minimum of one (1) and a maximum of four (4) zones. Inactive zones do not appear in the I/O Map or the Attack, Ratio, and Release Areas. The I/O Map, Attack Area, Ratio Area, and Release Area, are all immediately updated to reflect the number of zones you have selected with the Zone Number control.

> **Tip:** For very basic compression, enable only one zone.

> **Tip:** Use as many zones as you want. The number of active zones does not affect Neodynium's processor usage.

If you decrease the number of zones you are using, the undesired zones will be disabled and controls associated with that zone will no longer be seen. Zones are disabled from the bottom up. Thus, if you have one zone selected, only the red, upper-most zone will be active. While Neodynium will attempt to maintain the settings of a zone after it becomes disabled, there are cases where this may not be possible. For example, if you adjust an enabled zone such that the values of a disabled zone are no longer valid, the disabled zone's settings will be adjusted as necessary to make them valid when it is later enabled.

Reset

Located outside the right corner of the I/O Map, the reset control is used to flatten the Zones of the I/O Map and return them to their original locations. Press the Reset button to reset the I/O Map. Reset will not alter the number of zones you have enabled with the Zone Number control.

Attack Area

Located to the bottom left side of the Neodynium interface, the attack area contains sliders for setting the attack of each enabled zone. Displays indicating the numeric value you have set are adjacent and to the right of the sliders. The attack controls are colored to match their corresponding zone and are lined up vertically so you can easily gauge the value of a zone relative to other zones.

A Little on Attack

Attack is the term used to describe how quickly audio in a zone will reach full compression. In other words, attack specifies how long Neodynium will, theoretically, take to apply full compression at the ratio you've specified. Why theoretically? Because of the many variances in your audio and because Neodynium cannot read the future. That is, of course, unless you've enabled look-ahead (see **Key: Look-Ahead**).

A low attack setting will mean that the audio is very quickly compressed at the desired ratio. A higher setting allows compression to be phased in more gradually.

To adjust the attack of a zone, click on the handle of the slider and drag the attack slider from side to side. The handle is indicated by three vertical black lines on the right end of the slider. To enter your desired value directly, double click on the adjacent parameter text display (see

Hidden Features: Text Box Parameter Editing). Neodynium supports a minimum attack value of 20 microseconds and a maximum value of 500 milliseconds.

> **Tip**: Extreme attack and release settings can result in pumping and breathing and are often best reserved for special effects.

If a zone has been disabled (see **I/O Map: Zone Number**), the zone's attack slider is unavailable and the attack display will show "--".

Locking Zone Values

In use, it may sometimes be desirable to have the attack and/or release of one (or more) zone(s) identical to another zone. By using the Zone Attack (or Release) Lock mechanism you can achieve this aim. While the Zone Locking Mechanism is described below in relation to zone attack, the behavior is identical for zone release.

The Zone Attack Lock control consist of (1) a white bar (Attack Lock bar) which runs along the left side of the attack area, and (2) small white circles (Attack Lock indicators or indicators) adjacent to each zone's attack slider. Clicking on an indicator enables or disables Attack Lock for the adjacent zone. When enabled, the indicator appears "attached" to the attack lock bar; when disabled, the indicator is detached.

If you enable Attack Lock for a zone, the zone's attack is "snapped" to the value of all other locked zones. If there are no other locked zones when zone lock is enabled, the value will not be changed. If a zone's attack lock indicator is connected to the attack lock bar, it will be adjusted in tandem with all other zones so attached: all attached zones will maintain the same value.

When you first open Neodynium, the Attack settings of all zones are locked.

> **Tip**: Use different attack settings for your zones to fine tune your sound.

> **Tip**: Pay attention to your attack settings, even when you have a ratio of 1:1.

Ratio Area

Located at the bottom, middle of the Neodynium interface, below the I/O Map, the Ratio Area contains sliders for setting the ratio of each enabled zone. Displays indicating the numeric value you have set are adjacent and to the right of the sliders. Like the attack controls, the ratio sliders are colored to match their corresponding zone and are lined up vertically so you can easily gauge the setting of a zone relative to other zones.

Neodynium does not limit you to compression or expansion only. You may compress one zone while expanding another. However, you should keep in mind that while Neodynium is usually gentle, it has been known to bite if handled carelessly. Judicious use of compression and expansion together will yield the best results.

A Little on Ratio

A zone's ratio specifies the relationship between the zone's input and output, generally represented as the expression X:1, where X indicates how many times larger (or smaller) your input range is compared to the (*current)* output range. The input range is the range of levels being compressed. The output range is the range of levels the input range will be fit into. If X is larger than 1, the input range is larger than your output range and you are compressing. On the other hand, if X is smaller than 1, your input range is smaller than the current output range and you are expanding.

As a quick example, if you have a ratio of 4:1, it indicates that your input range is 4 times as large as your output range (compression). A ratio of 0.5:1 indicates that your input range is half (0.5) as large as your output range (expansion).

Now back to our regularly scheduled program...

Adjusting the Ratio & Using the Ratio Controls

In addition to the ratio controls, the ratio of each zone is also configurable using the I/O Map (when **ADVANCED** is enabled). Whenever adjustments in the I/O Map change a zone's ratio, the ratio slider and display are immediately updated. As such, you may adjust the ratio using the I/O Map while keeping an eye on the actual value(s) as displayed in the ratio area. Depending on your usage preference, you may never need to directly use the ratio sliders. However, Neodynium's ratio sliders provide a more traditional method of adjusting the ratio, if that is your preference.

> **Note**: When using the ratio sliders, Neodynium allows you to compress up to a maximum of 40:1 or a minimum of 0.50:1. As an indicator, a zone will become hashed when one of these limits has been reached.

When using the ratio sliders to adjust the compression ratio of a zone, Neodynium adjusts the zone using the traditional view of compression: by bringing levels down. In other words, Neodynium adjusts the output of the zone to achieve the desired ratio. Zones above are shifted so their ratios are maintained. The ratio of zones below are unaffected, as well. This behavior is very much similar to that achieved when using Zone Linking (Up) to make adjustments in the I/O Map (see **I/O Map: Zones: Zone Linking**).

> **Note**: When using the ratio area, levels are always brought down to achieve your desired compression. This is similar to the operation in most traditional compressors.

To adjust the ratio of a zone, click on the handle of the slider and drag from side to side. The handle is indicated by three vertical black lines on the right side of the slider. To enter your desired value directly, double click on the adjacent parameter text display (see **Hidden Features: Text Box Parameter Editing**). Neodynium will limit the compression ratio of a zone to a maximum of 40:1 when using the ratio sliders. Expansion will be limited to a ratio of 0.5:1.

No Compression, 1:1 Zone Ratio

Your attack and release settings are still valuable even when you have specified a ratio of 1:1 for a zone. If you have other zones that specify a compression ratio that is greater than one (1), for example, 3:1, in addition to a zone with a ratio of 1:1, you must pay attention to the attack and release settings you configure for the zone with the 1:1 ratio. Those settings will determine how quickly your audio achieves the 1:1 ratio, going back to no compression.

If a zone has been disabled (see **I/O Map: Zone Number**), the zone's ratio slider is unavailable and the display will show "--".

Release Area

Located at the bottom, right of the Neodynium interface, to the right of the Ratio Area, the Release Area contains sliders for setting the release of each enabled zone. Displays indicating the numeric value you have set are adjacent and to the right of the release sliders. Like the attack and ratio controls, the release sliders are colored to match their corresponding zone and are lined up vertically so you can easily gauge the setting of a zone relative to other zones.

Tip: Extreme release settings can result in "pumping" or "breathing". If you experience pumping, try decreasing your release setting. If you experience breathing, try increasing your release setting. See **Details, details: Pumping and Breathing** for more on pumping and breathing.

Tip: To control breathing problems, try using progressively longer release times on the lower zones.

A Little About Release

Release determines how long, in seconds, the compressor takes to "let go" of your audio, allowing it to return back to uncompressed levels. Release can be a difficult concept to get a handle on because its effect can be hard to hear. Failure to completely understand release and its place in compression often results in frustration with "pumping" or "breathing" effects. For more on understanding and controlling pumping and breathing, see **Details, details: Pumping and Breathing**

To adjust the release of a zone, click on the handle of the slider and drag the slider from side to side. The handle is indicated by three vertical black lines on the right end of the slider. To enter your desired value directly, double click on the adjacent parameter text display (see **Hidden Features: Text Box Parameter Editing**). Neodynium supports a minimum release value of 5 milliseconds and a maximum value of 5 seconds.

Tip: Use different release settings for your zones to fine tune your sound.

Tip: Pay attention to your release settings, even when you have a zone with a ratio of 1:1.

If a zone has been disabled (see **I/O Map: Zone Number**), the zone's release slider is unavailable and the display will show "--".

Locking Zone Values

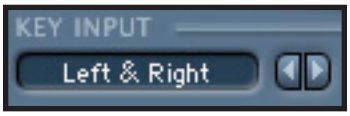
Zone Release Lock provides you with a way to maintain identical release values for two or more zones. This mechanism is described more thoroughly in **Attack Area: Locking Zone Values**.

When you first open Neodynium, the Release settings of all zones are locked.

Key

Neodynium provides you with an extensive mechanism to specify and configure the audio that is used to trigger its compression. You can also select from a variety of EQ/filter types to filter your key to fit your needs. Depending on your host and how you choose to use Neodynium, this allows you to perform tasks like ducking compression with ease. The Key Input, or simply the key, is the audio Neodynium analyzes to compress the input. By default, the input audio is used as the key. Controls for adjusting your key input settings are found on the left side of the Neodynium interface.

Key Input Selection



You'll find the Key Input Selection control at the top of the key area. Use the arrows located to the right of the display to click through the available key input selections. The choices available to you are determined by the number of channels being used (mono or stereo), in addition to your plug-in format (e.g., not all plug-in formats directly support the use of sidechains). As such, all of the key input selections indicated in the table below may not, unfortunately, be applicable to you. However, because of the variety in the key input selections available in the stereo version, there are ways around some of these limitations.

Plug-In Channel Format	Key Inputs Available	Description
Mono	Input	input
	Sidechain	*if available* - some plug-in formats do not directly support sidechains; if not supported by a plug-in format this option will not be visible
Stereo	Left	left channel
	Right	right channel
	Left & Right	the default; channels are combined and the resulting signal is used to trigger compression
	Sidechain	*if available* - some plug-in formats do not directly support sidechains; if not supported by a plug-in format this option will not be visible

Analysis Mode (Peak or RMS)

By default, Neodynium analyzes the key input's peak level(s) to determine when and how much to compress. However, you also have the option of analyzing the audio in RMS mode instead of peak. Click the **RMS** control to have Neodynium analyze the RMS level(s) of your audio to trigger Neodynium's compression.

> **Note:** Your analysis mode will determine how much output gain Neodynium applies when automatic gain compensation is enabled (see also **Navigating Around Neodynium: Output Trim and Automatic Gain Compensation**).

RMS compression looks at the average level of the signal and is less responsive to transients. As such, RMS compression yields a smoother, more natural sound. Enable **RMS** when you want to control the overall level of the audio as opposed to the transients.

Look-Ahead

Because, by default, Neodynium cannot look into the future, it is possible, depending on your audio, that your audio may not be compressed in time. For example, if your audio shot up to 10 dB for just a bit and immediately came back down, depending on your attack settings, Neodynium might not apply compression quickly enough to reach your desired ratio. To catch these cases, you can have Neodynium take a peek at future, upcoming audio, enabling it to adjust its compression to avoid missing sharp transients. This peeking at future audio levels is termed "look-ahead." The amount of time that Neodynium "peeks" into the future is determined by the setting of the look-ahead control. The Look-ahead may be set from 0 (no look-ahead) up to 10 milliseconds.

Tip: Using look-ahead helps when fine-tuning the shape of sharp transients, like a snare drum.

Tip: To ensure your output doesn't exceed 0 dB, activate Neodynium's Auto-Limiter (see **Navigating Around Neodynium: Limiter**).

Note: Many hosts are unable to respond to changes in the amount of plug-in delay (look-ahead), in real-time. Consult your host's documentation if you are unsure whether this is true for your host.

To adjust Neodynium's look-ahead you may: (1) drag the look-ahead slider knob from side to side until your desired value is reached, or you may (2) use the arrows to step through possible values, or (3) enter your desired value directly by double clicking on the adjacent parameter text display (see **Hidden Features: Text Box Parameter Editing**). The look-ahead display, found to the left of the arrows, is adjusted to reflect the new value.

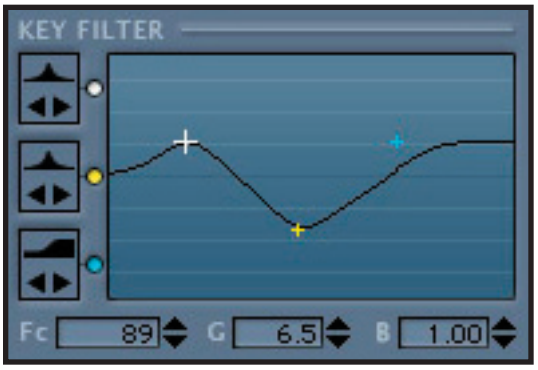
Note: When using the keyboard to enter a look-ahead value directly, the way the entered value is interpreted depends on the look-ahead's current display mode. For example, if the look-ahead is being displayed in terms of samples, the entered value is interpreted as samples.

Look-ahead is, of course, not without its price. To look-ahead, Neodynium must analyze a certain amount of input audio (determined by the look-ahead setting) before it can produce an output. In other words, it introduces a delay. For this reason, you should consider your host's ability to compensate for plug-in induced delay when deciding whether to enable look-ahead .

> **Tip:** OPTION[CTRL] + click the look-ahead display to toggle between displaying the look ahead in samples and in seconds.

You can display the look-ahead in terms of samples by OPTION[CTRL] clicking on the look-ahead display. This is useful if you find you need to compensate for any delay manually (by shifting tracks). Click on the display to alternate between displaying the look-ahead in time or samples.

Key Filter



Neodynium's key filter area is used to filter your key input, useful for de-essing and other tasks. You may filter your key input using up to three filters with types including parametric, shelving, low/high/band pass, and notch.

Utilize the key filter to make Neodynium more or less responsive to certain aspects of your audio. For instance, for de-essing, boost the areas that are most prevalent when the vocalist produces sibilance - the compressor will react more readily to audio containing sibilance. If you are compressing a bass-heavy mix, and the bass drum is controlling the dynamics of the mix, get it under control using the key filter. Filtering the compressor's key is often one of the most overlooked methods to achieving great results. Experiment here and you will be rewarded. Neodynium makes this easy.

You will use the following controls when configuring your key filter: filter selection controls, filter enable buttons, filter graph, and filter parameter controls.

Filter Selection and Enable

Along the right side of the Key Filter area, you will find sections for specifying and enabling the three filters you may activate on your key input. Each section contains an image indicating the filter type currently selected, arrow controls for viewing and selecting a different filter type and, to the right, a button to enable or disable the filter. See the following table for a list of the available filter types and their corresponding images.

For ease in identifying your filters when manipulating them in the filter graph, each filter is color coded. When active, a filter's enable button changes to reflect its color. Additionally, a similarly colored cross-hair, or handle, appears in the filter graph to allow you to directly position the filter. When a filter's enable button is depressed, the filter is active and is being used to filter your key input. The filter graph always displays the total effect of all active filters.

> **Note:** Neodynium keeps track of the parameter values you have set for each key filter and key filter type.

You may enable all, none, or any combination of the three available filters. Because your settings are remembered when you disable a filter and when you select a new filter type, you are free to enable or disable a filter at any time to audition its effect. For example, if you select a parametric filter and adjust its parameters, then try a new filter type, if you re-select the parametric filter, the parameter values you set when you last selected the parametric filter will be recalled. Similarly, if you disable, then enable a filter, the filter's parameter values are retained. When a filter is disabled, its handle no longer appears in the filter graph and the filter graph is updated to reflect the filter's absence.

Filter Selection	Filter Type	Parameters
	Parametric	Gain, Frequency. Q/Bandwidth.
	Low Shelf	Gain. Frequency. Q/Bandwidth.
	High Shelf	Gain. Frequency. Q/Bandwidth.
	Low Pass	Frequency. Q/Bandwidth.
	High Pass	Frequency. Q/Bandwidth.
	Band Pass	Frequency. Q/Bandwidth.
	Notch	Gain, Frequency. Q/Bandwidth.

Filter Graph

The filter graph provides an interactive visual depiction of your key filter. If a key filter is active, you may click and drag in the filter graph to adjust the filter's frequency and gain, if applicable. There are key commands available to make adjustments in the filter graph easier. For example, to adjust only a filter's frequency, hold down CMD [CTRL+SHIFT] while dragging; to adjust only the filter's gain (if applicable), hold down SHIFT [SHIFT]. You may also adjust a filter's Q or Bandwidth by holding down OPTION [CTRL] and dragging in the filter graph.

> **Tip:** Key commands are available to limit filter movement when dragging in the filter graph. Press CMD [CTRL+SHIFT] and drag to adjust only the filter's frequency. Hold SHIFT [SHIFT] and drag to adjust only the filter's gain.

The filter graph can be used to apply a maximum of 20 dB of gain and a minimum of -20 dB.

Filter Parameter Controls

Neodynium's Key Filter parameter controls provide you with another way to adjust your key filter(s). The frequency, gain, and Q/bandwidth/slope (if applicable), of the currently selected filter are displayed in the parameter areas below the filter graph. While it is convenient to directly position your filter by dragging its handle in the filter graph, you may sometimes wish to make small or specific changes to a value. In this case, select the desired filter by mousing over it. The filter's settings are displayed in the parameters area for you to view and/or edit. You may enter your desired value directly by double clicking on the parameter text display (see **Hidden Features: Text Box Parameter Editing**).

Some parameters are not applicable to all filters. For example, the gain parameter does not apply to low/high pass filters. If a parameter does not apply to the selected key filter type, the corresponding filter parameter display will show "-".

> **Tip:** You can adjust a filter's Q/Bandwidth, if applicable, by holding OPTION [CTRL] and dragging in the filter graph.

Key Gain

In some situations, you may find it useful to boost or cut your key's level. The key gain slider allows you to apply cut/gain from -30 dB to 10 dB. The adjacent display indicates the current value. To adjust the key gain setting, drag the slider knob from side to side. Alternatively, you can make small adjustments to the key gain using the arrows located between the key gain slider and the key gain display. To enter your desired value directly, double click on the parameter text display (see **Hidden Features: Text Box Parameter Editing**).

Key Audition

Key Audition, the last section in the Key area is not used to configure your key input, but rather, helps you check your key to ensure it is configured as desired. Key Audition can be an invaluable tool and time-saver when setting up your key. There are four buttons in the Audition section: Off, In, Out, and Proc (Process):

OFF: The default setting. Not auditioning. The output you hear is the output of the compressor.

IN: Allows you to audition the key input, pre-filter and pre-key gain.

OUT: Allows you to audition the key input, post-filter and post-key gain. This is the key exactly as used by Neodynium to trigger compression.

PROC: Allows you to run the key through Neodynium to audition the effect. In other words, when **PROC** is enabled, Neodynium process the actual key instead of the input. By ensuring that the appropriate areas of your key are affected as desired when passed through the compressor, you can ensure that your input will also be affected as you desire. Though this feature may not be a familiar one to you, it can be indispensable when configuring your key. Because this information is so valuable, Neodynium's Key Output meter, found to the right side of the I/O Map, always displays the current peak level of this audio (see **Key Level Meters** later in this section).

Note: Auditioning is automatically turned off when the Neodynium user interface is closed to prevent it from being inadvertently left on.

Note: When audition is active, the primary peak meters reflect the level of the audio being auditioned. As an indication of this feature, the meters are colored white instead of the usual green.

Key Level Meters

While using Neodynium, you may notice small geometric shapes bouncing, twitching, and jumping along the sides of the I/O Map. Not to worry, those little guys are there to help you. Located somewhere on the left and right side of the I/O Map are the Key Level Meters - small triangles that provide you with invaluable information.

Input Meter

When audio is passing through Neodynium, you will see one small triangle move along the left, input side of the I/O Map (assuming the level of your audio is within the range currently displayed by the I/O Map). This triangle indicates the level of your key input. Along with your hearing (which is usually important when doing audio related tasks - go figure) you can use the key input level meter to determine where to focus your compression efforts.

The level indicated by the key input meter is post- key filter and post- key gain. This means your key filter and key gain will affect the reading of this meter. The key input meter is an accurate gauge of the level that is determining the action of the compressor.

Output Meters

Unlike other compressors where your key is always your input, Neodynium makes a clear distinction between key output levels and the compressor's output levels. Neodynium's true output levels are displayed in the primary metering section (see **Navigating Around Neodynium: Meters**). Key output levels are indicated by two small arrows along the right side of the I/O Map. In this section, we'll be discussing the two types of key output meters Neodynium provides.

Key Target Output Level

In the simplest compression case, each sample would be treated completely independently. In this case, there would be no place for Attack and Release, which

introduce dependencies between the current sample and prior samples, and, as such, the ratio you have selected would always be applied fully. We term the output level obtained when considering the compression in this manner the "target" output level. The target output level of your key is indicated by the small grey triangle closest to the right side of the I/O Map.

> **Tip:** The Key Target Output is indicated by the small grey arrow closest to the right side of the I/O Map.

Key Processed Output Level

While the example given in the section above sounds good, in reality, we like more control. We need to specify an attack and release to determine the smoothness or abruptness of, and to add continuity to, our compression. Because of the nature of attack and release, the amount a given sample will be reduced is dependent on the value of prior samples and/or, (if using look ahead), possibly future samples. In other words, when using attack and release, your specified ratio may not be applied fully to a given sample.

To make efficient use of a key other than your input, analyzing the way your key is processed is imperative. This is true even if your key is a filtered version of your input. To assist in this analysis, Neodynium provides you with a meter which indicates the output level obtained when your key is run through the compressor. We refer to this level as the Key Processed Output. The Key Processed Output level is indicated by the small white triangle located to the outer right side of the I/O Map.

> **Tip:** The Key Processed Output level is indicated by the small white arrow on the outer right side of the I/O Map.

> **Note:** The Key Processed Output level corresponds to the audio you hear when **Proc** is enabled in the Key Audition area (see **Key Audition** earlier in the section).

Using the Key Output Meters

The key output meters are most valuable when considered together. By observing how your Key Processed Output varies from your Key Target Output, you can get a good sense for how your attack and release settings are affecting Neodynium's ability to hit, or miss your goal(s). For example, if you are compressing your signal and see that your Key Processed Output is always significantly above your Key Target Output, you may wish to adjust your attack to a lower value. On the other hand, if you find that your Key Processed Output lags behind your Key Target Output, you may wish to adjust your release to a lower value. This is just a guide, however. There are few cases when there will be no variance between your Key Processed Output and your Key Target Output - and this may not be desirable to reach your particular goal(s). As usual, let your ears be your guide.

> **Tip:** Take the time to get familiar with the Key Output Level meters - they can provide you with invaluable information.

To get familiar with using the Key Output Meters, use Neodynium to compress some audio and adjust your attack and release settings. Observe how your Key Processed Output changes and how it varies from your Key Target Output.

Metering

Meters, meters, meters - of course Neodynium provides you with meters a-plenty to accurately gauge how you are affecting the dynamics of your audio. For easy comparison, the input and output meters are located together on the right side of the Neodynium interface. Three types of meters are provided: "cloud" meters, peak meters, and an Attenuation meter. Cloud and peak meters are provided for both your input and output. These primary meters are in addition to the key level meters (see **Key: Key Level Meters**).

Cloud Meters

Located along the outside left (input meters) and right (output meters), Neodynium's cloud meters are an invaluable tool for analyzing the dynamics of your audio. In the stereo version, for both input and output, separate meters are displayed for each channel. Cloud meter levels

take into account the setting of the input and output trim controls (see **Navigating Around Neodynium: Input and Output Trim**, below).

What is it?

You can think of the cloud meters as indicating the amount of energy at a given level. Or to put it another way: How much your audio is concentrated at a particular level. As the amount of energy at a particular level increases, the cloud meter color changes from black to white and eventually to orange and red.

How do I read it?

Look at the meter overall. Do you see changes throughout the meter? Do you see many white areas (that may come and go) over the range of the meters? If you see white or red concentrated in virtually only one area, especially if it's near the maximum, this is an indication that your audio has little dynamic range. In this case, you may want to reduce your compression to bring back some dynamic range to your audio. However, this is just a guide, in some cases it may be normal or desirable to have most of the energy concentrated at a given level.

Peak Meters

Peak meters are located on the inside of the cloud meters. Neodynium's peak meters feature peak hold bars (with a 5 second hold time) and red over indicators located directly above the meters. When your signal exceeds 0 dB, the over indicators light. Once lit, the over indicators will gradually fade in color. However, they will not completely dim unless they are clicked, to reset them. The over indicators are not an indication that your audio has been clipped. The signal is not clipped or otherwise distorted by Neodynium, but may be by your host. You should check your host's documentation if you are unclear about the way plug-in output values that exceed 0 dB will be handled.

> **Note:** Over indicators indicate your audio exceeds 0 dB. Neodynium does not clip these values. Enable the Auto-Limiter if you want to ensure Neodynium's output does not exceed 0 dB.

As with the cloud meters, in the stereo version, separate meters are displayed for each channel. This applies to both input and output. The peak meter level takes into account the setting of the input and output trim controls (see **Navigating Around Neodynium: Input and Output Trim**, below). When Audition is active (See **Navigating Around Neodynium: Key: Key Audition**), the peak meters reflect the level of the auditioned audio. As an indication that the meters no longer reflect the compressor's output, the meters are white instead of green.

> **Note:** When audition is active, the peak meters reflect the level of the audio being auditioned. As an indication of this feature, the meters are colored white when auditioning.

Attenuation Meter

Neodynium's attenuation meter gives an indication of the amount of compression currently being applied. However, because the amount of attenuation depends on, and is determined by, considering the settings of each zone, it may not initially seem to correlate as you expect (e.g. if you are compressing one zone but expanding another). Until you get used to interpreting Neodynium's attenuation meter, you may wish to rely more on the cloud and peak meters, which give a very good indication of what is happening to your audio.

Input and Output Trim

Controls for adjusting the amount of gain applied to your input and output are found adjacent to the primary meters (see **Navigating Around Neodynium: Meters**). The input trim control is located to the left of the meters; the output trim control is located to the right. To adjust the setting, drag the slider knob up or down. The current value is displayed directly below the slider. You may enter your desired trim setting directly by double clicking on the text display (see **Hidden Features: Text Box Parameter Editing**).

Input Trim

At some point, you may need to boost/cut your input signal. You'll use the aptly named, Input Trim control, for this purpose.

For flexibility, Neodynium, does not compress audio above 0 dB. As such, if your audio has levels that exceed 0 dB that you want to compress, you can use Neodynium's input trim to bring the input down so the levels no longer exceed 0 dB. When the levels have been brought down in this way, they will then fall into one of your zones and will be compressed accordingly. If you do not wish to compress audio above 0 dB, there are no additional steps to take.

> **Tip:** If you want to compress audio that with levels above 0 dB, use the input trim to bring the input down so that all levels are at or below 0 dB.

Output Trim and Automatic Gain Compensation

If you bring down the maximum level of your audio, you may want to boost the entire signal to take advantage of this additional headroom. To do this, the Output Trim control must be adjusted each time you change the amount by which you are bringing down the level of your audio. This potentially tedious affair is made simple by enabling Automatic Gain Compensation. You enable Automatic Gain Compensation by clicking on the **AUTO** button located above the Output Trim control. When enabled, your output trim will automatically be adjusted to make-up for the extra headroom your compression has created. The amount of output gain Neodynium applies depends on whether you are using RMS or Peak analysis of your key input.

> **Note:** The amount of output gain Neodynium applies will depend on whether your are using the RMS or Peak key analysis mode (see also **Navigating Around Neodynium: Analysis Mode (Peak or RMS)**).

> **Note:** Automatic Gain Compensation only applies when you have brought down the maximum output level of your audio as indicated by the Max I/O Line.

Automatic Gain Compensation only applies when you have brought down the maximum level of your audio. If you have compressed some zones but have not actually brought down the level of your audio (by adjusting the output of the Max I/O Line below zero), there is no compensation. See **Navigating Around Neodynium: I/O Map: Zones: Max I/O Line** for more details.

When **AUTO** is enabled, because Neodynium is determining the amount of output gain to apply, automation data received from your host for the output trim control is ignored. If you want Neodynium's output trim to be controlled by automation you have written, you should disable **AUTO**.

Auto-Limiter

Neodynium has a built-in limiter (Auto-Limiter) for use when you want to ensure that your audio does not exceed 0 dB. The limiter controls can be found below the meters and input and output trim controls. Your setting here determines how Neodynium handles output values that will exceed 0 dB.

You will notice that Neodynium's Auto-Limiter does not provide attack, release, or threshold controls. Neodynium employs an advanced limiting algorithm that predicts what your audio will do and preserves details that would otherwise be lost to clipping. The three Auto-Limiter settings determine how responsive the Auto-Limiter is to the audio it sees. The Medium response mode (**M**) should fit most circumstances. If in doubt set it here.

Auto-Limiter Mode	Description
OFF	No limiting. Output may exceed 0 dB.
F	Fast response. Output will not exceed 0 dB.
M	Medium response. Output will not exceed 0 dB.
S	Slow response. Output will not exceed 0 dB.

To enable a limiter mode, click the corresponding button. Each mode has its own "sound." You may switch between modes at any time. As indicated in the chart above, Neodynium's Auto-Limiter is a brick wall limiter. When the Auto-Limiter is on, no matter what the setting, it will not allow your audio to exceed 0 dB.

Workspaces

A and **B**. The controls for two workspaces, **A** and **B**, are located at the bottom, middle of the Neodynium interface. The two workspaces provide separate areas for developing your ideal compression settings. Switching between workspaces enables you to easily compare and contrast the affect different settings have on your audio. To choose a workspace or switch between workspaces, simply click the button of the workspace you would like to make active. When a workspace is active, its button is depressed.

CPY. You can copy your current settings to the inactive workspace by clicking the green **CPY** button located to the right of the **B** button.

CLR. Clear a workspace by pressing the red **CLR** button located to the left of the **A** button. Clearing a workspace resets *all* settings to their default values.

Load and Save

The **LOAD** and **SAVE** controls are located at the bottom right of the Neodynium interface – to the right of the workspace controls. Using the integrated **SAVE** and **LOAD** gives you the ability to create settings that you can load and use when using Neodynium with any host or plug-in format.

LOAD. Press **LOAD** to select a settings file to load from disk. When you press load you will be presented with a standard dialog box for you to specify the Neodynium settings file you wish to load. When you load a Neodynium settings file in this manner, you will lose any changes in your current workspace.

SAVE. Neodynium gives you the functionality to save the settings in the current workspace to disk for future use as a preset or for backup purposes. Pressing **SAVE** opens a standard dialog box enabling you to specify a name for the saved file and the folder where it should be placed. For your convenience, the entire state of your workspace is saved.

Details, details

The preceding sections gave you a thorough overview of Neodynium's interface, providing you with the information you need to utilize Neodynium's features. This section gives more detail on a few important aspects of Neodynium.

Supported Sampling Rates

Neodynium supports sampling rates of 88.2 kHz, 96 kHz and even 192 kHz. Of course, Neodynium can be used with lower sampling rates, as well. The sampling rate Neodynium uses is determined by, and also limited by, the sampling rates available in your host application. There is no need to configure Neodynium to use the higher sampling rates. If a sampling rate of 44.1 kHz is in use, Neodynium will operate at 44.1 kHz; if a sampling rate of 96 kHz is in use, Neodynium will use that sampling rate.

Mono and Stereo

Neodynium comes in both a mono and stereo version. The mono version is for use on one channel of audio. The stereo version is for use on two channels of audio – a stereo pair. There are some minor differences in functionality and appearance between the mono and stereo versions:

1. The mono version does not offer the ability to select "Right" or "Left & Right" as the key input. This is because there is only one channel available, selectable as "Input", in the mono version.
2. The mono version's meters are not split as are the meters in the stereo version – again because you are monitoring only one channel.

Beyond these differences, the operation, look, and feel of the mono and stereo versions is identical.

But, Where's My Sidechain?

Some plug-in formats offer options and functionality that is either unavailable, undocumented or unusable, or completely unsupported in other formats. Unfortunately, this is the case for sidechain support. You will only see "Sidechain" listed as an available key input if it is supported by your plug-in format/host. However, if true sidechain support is not available to you, there may be ways for you to achieve the same effect.

For example, if you wish to use a sidechain to trigger compression of a mono signal, use the stereo version of Neodynium instead. If you have a host that allows flexible signal routing, you may be able to route your mono audio to the left channel and your key audio to the right channel. You can then set the key input to "Right" to use that audio as your sidechain. Alternatively, you can use your host to create a stereo track/file using your mono input as the left channel and your desired key audio as the right channel. As in the previous example, you'd then specify "Right" as your key input. These options are not applicable to using a sidechain to trigger compression of stereo audio.

Pumping and Breathing

Now don't go getting any ideas, we're still talking about compression here. "Pumping" and "breathing" are, together, the nemesis of many a compressor user. But what do these terms mean? We consider breathing the effect when noise, or a vocalists breaths, are unintentionally brought out or accentuated by compression. On the other hand, when compression causes the audio levels to rise and fall abruptly, often in an obvious pattern, we refer to it as pumping. Pumping often occurs when an individual drum track, or drum in a mix, is triggering the compressor. When undesired, these effects are sometimes incorrectly identified as a failure of the compressor. In fact, you control whether pumping and breathing are audible in your audio by your choice of attack and release settings. The following examples should help you to understand and avoid pumping and breathing, if and when that is your desire.

Breathing

When a portion of your audio is compressed and its levels have been brought down, it will be less pronounced next to audio that has not been compressed and vice versus, the uncompressed audio will be more pronounced. That's because there is less of a difference between the compressed audio and the uncompressed audio. Take, for example, the following case: Initially your audio peaks around -10 dB and there is noise at about -40 dB which follows shortly after your audio peaks. If you compress those peaks and bring them down to -20 dB, you've brought your audio

10 dB closer to your noise level. This will have the effect of making your noise much more noticeable - if you don't choose your compression settings thoughtfully.

Keeping that in mind, assume you have a vocal track. In a vocal track there are periods when there is no vocal, for example, if the vocalist is pausing between words. These breaks are virtually never filled with complete silence. Generally, there is some noise and there may also be breathing sounds present. This breathing could be the "noise" in the previous example. The vocals contain the audio peaks we want to compress.

Now, assume you choose a very short release time, instructing Neodynium to very quickly allow your audio to return to an uncompressed state. If the release is short enough, none of the trailing breathing and/or noise will be compressed - you squashed the vocal, but then told the compressor to "let go" before it could compress the noise. Because you have brought the vocals closer in level to the "noise," it makes the noise more pronounced. In fact, the higher your compression ratio, i.e. the more you are compressing the audio, the more pronounced the noise. When you subsequently boost the output of the compressor to use some of the headroom gained by compressing the peaks - you will also be boosting the noise! This can result in very audible "breathing" between the compressed vocals. Choosing a longer release time will allow the noise to be compressed as well as the vocals, reducing this effect. Adjusting your compression ratio to a lower value (less compression), may also be necessary.

> **Tip:** Try using progressively longer release times on the lower zones to control breathing while staying true to your desired sound.

Pumping

You can get pumping in several ways, but it is always the result of the same thing: the compressor obviously jumping into and out of action. Because of the nature of drum hits, pumping is most often heard and associated with drums. A drum hit contains the initial high energy peak, but also contains a significant much lower energy tail that is critical to its sound.

Considering what we discussed above in **Breathing**, if you choose a long release time when using a drum track to trigger your compression, you could lose vital audio. This is because the longer release time means the compressor continues compressing for a longer period (note that this is what we want to avoid breathing). If you compress an already low level significantly, you may render it virtually inaudible. If you are compressing the drum track itself and using make-

up gain to compensate, this would result in an obvious punch on the initial drum hit but a loss of the tail. Thus you get pumping: a strong punch followed by very little audible material followed by a strong punch, and so on ...

You can also get a pumping effect when compressing an entire mix. If you have a dominant sound in your mix whose level is generally much higher than surrounding audio, that is what will trigger the compressor. As that sound comes and goes in your mix, so will the compressors action. This will be especially obvious if the sound comes and goes rhythmically and has a lot of initial energy, like a drum hit. If your ratio is high and your release and attack settings are not chosen carefully, the level of your mix will very obviously fall and rise based on the presence or absence of that sound. Reducing your compression and using moderate release and attack settings are probably your best bet for controlling this problem. In fact, if you are compressing an entire mix, you will probably not be using high ratios.

As if you didn't know already, compression is definitely not a paint-by-numbers affair. The ideal attack, release, and ratio settings are highly dependent on the audio being compressed. What is appropriate in one case may almost never be appropriate in another. However, there are a couple rules of thumb you may want to keep in mind when choosing release settings:

1. If you don't want what is after the peaks, you probably need a longer release.
2. If you do want what is after the peaks, you probably need a shorter release.

Danger, Will Robinson! *or* The Obligatory Warning on Over-compression

Over-com*press*ion, over-com*schmess*ion. Everywhere you turn these days there is a warning on the perils of over-compression. And, as you see, this guide will be no different.

While compression is often used to make audio louder without increasing the overall maximum level, its use extends far, far beyond this concept. For example you can use Neodynium to bring out the attack of the pluck of the strings of a guitar track or to change the sound of a snare. Though it is perfectly possible to bring all audio levels in a track or mix into a very narrow range, this usually does not produce more pleasing audio. OK, OK, sometimes it seems to, but keep reading...

Human hearing is designed to perceive a range of audio levels and, in fact, audio is generally most pleasing when there is variability in the levels. Without this variation, many sounds become stressful, irritating, and tiring. Further, the listener's ability to pick up and experience

the individual elements in the audio may be significantly hampered when all sounds are constantly at the same level.

This is not to say there is no place for compressing with the intent to increase the loudness of your audio. There are many cases where this may be necessary or desirable to ensure the audio's playability and listen-ability. As in most things, moderation is the key. Compressing to boost your audio's loudness is not the swiss army knife for your audio. When used in this manner, compression may more often serve to highlight a poor mix rather than fix it.

Now, go forth - and compress.

Text Box Parameter Editing

Some parameters may be edited by directly entering text using the keyboard. When supported, double clicking on the parameter display enables a text box in which you may enter your desired value. The minimum and maximum values of the parameter to be modified are still respected when using this method of parameter adjustment. If you enter a value outside of a parameter's supported range, the parameter value will be limited by, and thus forced to, the parameter's minimum or maximum, as appropriate.

Alphabetic Multiplier Postfix Characters

For your convenience, the following alphabetic postfix characters are supported when entering numeric values into a parameter text box. Adding a character to the end of a numeric value has the effect of multiplying the entered number by the indicated multiplier (see **Example** in the table below). Unknown characters are ignored.

Character	Meaning	Multiplier	Example
m	*milli*	10^{-3} / (0.001)	3m for 0.003
mc, u	*micro*	10^{-6} / (0.000001)	6u for 0.000006
k	*kilo*	10^{3} / (1000)	1k for 1000

Punctuation and Separators

Decimal points and commas are used to denote decimal/fractional values only. For example, you may enter 3.5m or 3,5m to indicate three and one-half milli. Accordingly, you should not add punctuation to separate thousands. For example, to enter one thousand, five hundred, enter 1500, 1.5k, or 1,5k - do not enter 1,500.

Note: Do not add any punctuation to separate thousands.

Single Parameter Adjustment In Key Filter Graph

Gain Only Filter Parameter Adjustment

Press SHIFT [SHIFT] to limit changes to only the filter's gain. With SHIFT [SHIFT] pressed, click and drag a filter up and down, as usual, to adjust the gain. No changes will be made to any other parameters when in this mode. For your convenience, a vertical guideline appears in the plot as a reminder of which direction movement is permitted.

Frequency Only Filter Parameter Adjustment

Press CMD [CTRL+SHIFT] to limit changes to only the filter's frequency. With CMD [CTRL+SHIFT] pressed, click and drag a filter left and right, as usual, to adjust the frequency. No changes will be made to any other parameters when in this mode. For your convenience, a horizontal guideline appears in the plot as a reminder of which direction movement is permitted.

Q/Bandwidth/Slope Filter Parameter Adjustment

Press OPTION [CTRL] and drag up and down, to limit changes to only the filter's Q, bandwidth, or slope. No changes will be made to the gain or frequency when in this mode.

About Box/Modifier Key List

Click on the Neodynium name or the Elemental Audio Systems logo to display the Neodynium About Box. The About Box displays some important and helpful information. In addition to the version number (in the upper right corner), you will find a list of the modifier keys you can use with Neodynium and their associated function(s).

Modifier Keys

Some portions of Neodynium's interface exhibit different behavior if you depress a key, referred to as a "modifier" key, while they are operated. This section lists all the modifier keys you can use to access alternate functionality in Neodynium. You must press and hold down a modifier key while operating a control - pressing these keys alone will not perform any action. Only certain controls have alternate behavior. Consult the appropriate area in the manual for more information on using a control's associated modifier key. You can see a list of these key modifiers at any time by clicking on the Neodynium name or the Elemental Audio Systems logo.

Tip: You can see a list of Neodynium's key modifiers at any time by clicking on the Neodynium or Elemental Audio Systems logo.

Mac		
OPTION	+ drag in key filtergraph	Adjust Q/bandwidth/slope
	+ click Look-Ahead display	Toggle between displaying look-ahead in terms of samples and time
	+ drag input/output flag	Link zones below (Advanced Mode)
SHIFT	+ drag in key filtergraph	Adjust filter gain only
	+ click fader	Reset fader to default value
	+ drag input/output flag	Link zones above (Advanced Mode)
CMD	+ drag in key filtergraph	Adjust filter frequency only

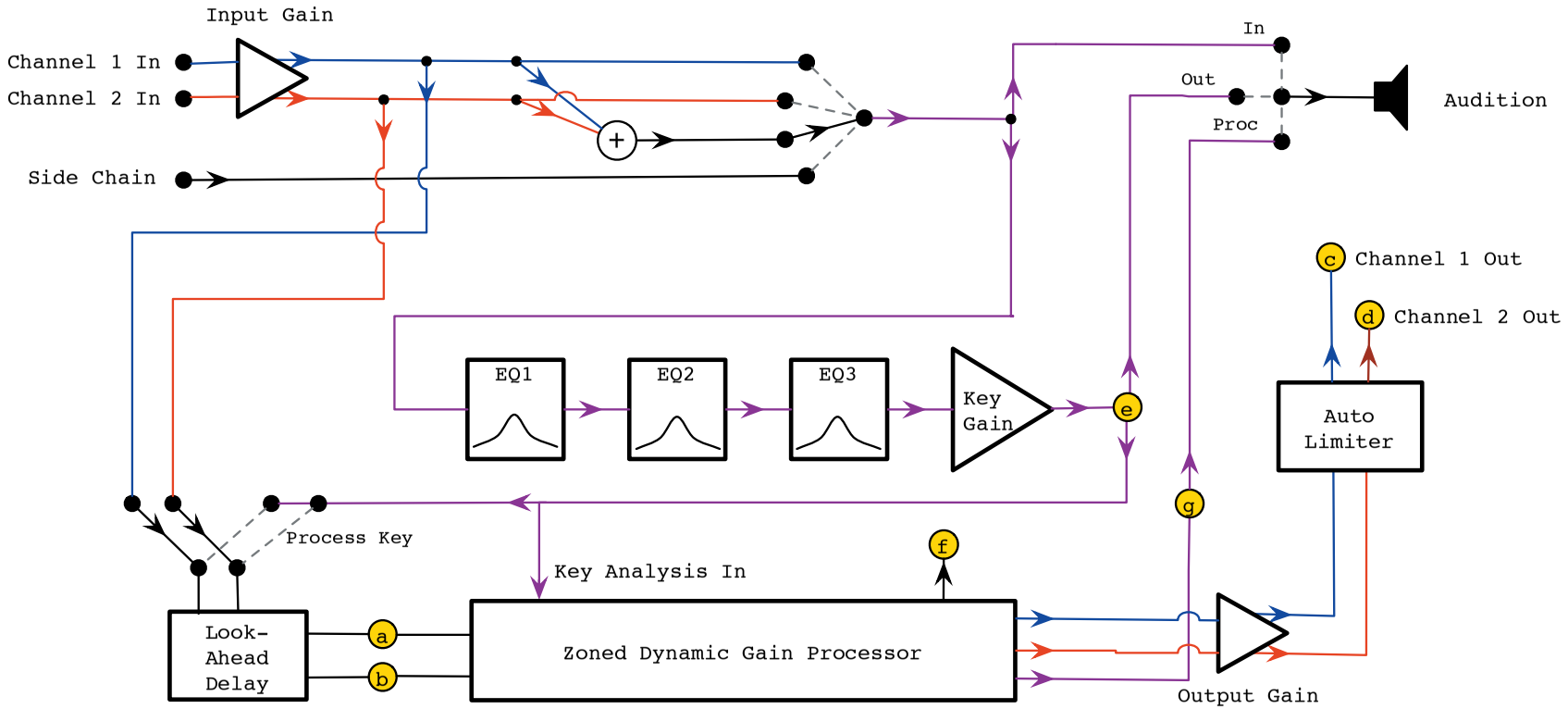
Windows		
CTRL	+ drag in key filtergraph	Adjust Q/bandwidth/slope
	+ click Look-Ahead display	Toggle between displaying look-ahead in terms of samples and time
	+ drag input/output flag	Link zones below (Advanced Mode)
SHIFT	+ drag in key filtergraph	Adjust filter gain only
	+ click fader	Reset fader to default value
	+ drag input/output flag	Link zones above (Advanced Mode)
CTRL + SHIFT	+ drag in key filtergraph	Adjust filter frequency only

A. Preset Listing

Brutal	Severe compression. Special effects.
De-Esser	Sibilance suppression. Note: Tune key filter frequency for your vocalist and adjust key gain for best sound.
Drums	Drum kit/track compression.
Dynamics Restoration	Adds dynamics to lifeless audio. Note: Try mixing the compressor output with the original.
Full Mix 1	As the name says. Brings up the peaks.
Full Mix 2	Full mix compression. Smoother RMS compression to even out levels. Note: Be sure to adjust the Key Gain and Output Gain.
Full Range Vocal Comp	Vocal compression. Low threshold to tame dynamic vocalists.
Inside Out Snare	Snare drum special effects.
Intimate Vocal	Vocal compression. Up close and personal sound.
Mid Level Compression	Moderate compression of mid-level peaks.
Moderate 1	Moderate RMS compression.
Moderate 2	Moderate RMS compression. Releases more quickly as the level drops.
Smooth 1	Light RMS compression.
Smooth 2	Edgy, but light RMS compression. Lets peaks retain original dynamics. Ignores low end fluctuations.
Snare Pop	Snare drum special effects compression.
Strong	Strong compression. Fast attack to catch most peaks. Release eases gain down as signal drops.
Subtle	Very light compression.
Tight Snare	Snare drum.
Vocal 1	Vocal compression (basic).
Vocal 2	Vocal compression. Slightly less compression than Vocal 1, but limiter engaged to catch unruly peaks.

B. Signal Flow Diagram

Neodynium Signal Flow Diagram



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