



TC|MASTERX³

USER MANUAL

[TC|MASTERX³⁺⁵]



[MORE PUNCH]

[MORE CONTROL]

[48 BIT DOUBLE PRECISION]

[OPTIMISED FOR VOICE PROCESSING]

TC MASTERX³⁺⁵ not only gives you the popular three band version of TC MASTERX, but also the new TC MASTERX⁵ with a total of five frequency bands in the Compressor, Limiter and Expander sections. Thanks to the innovative user interface of TC MASTERX this does not bring a flood of additional parameters – desired results can still be achieved quickly and intuitively!

MORE PUNCH → With five frequency bands you can increase the perceived loudness of your audio material even further.

MORE CONTROL → The number of bands active can be set to any number from one to five to match the specific needs of a whole host of mastering situations. Auto Make Up Gain can be de-activated whenever desired. By individually boosting each of the five bands, the overall balance can be more precisely finetuned.

OPTIMISED FOR VOICE PROCESSING → With selectable crossover slope characteristics and an additional target curve made especially for voice processing, MASTERX⁵ is perfect for processing vocals and voice overs.

48 BIT DOUBLE PRECISION PROCESSING → TC MASTERX⁵ operates at a resolution of 48 Bit at 48k for even more accurate processing results.

Contact your local TC Works distributor to order your TC MASTERX³⁺⁵ Upgrade! A list of all TC Works distributors can be found on the enclosed Product Line brochure or at www.tcworks.de



TABLE OF CONTENTS

I

ABOUT THE COMPANY	2
WELCOME TO TC MASTERX	3
INSTALLATION MAC	4
USING PRESETS	5
GENERIC CONTROLS	5
MASTERX³ – OVERVIEW	6
MASTERX³ – PARAMETERS	8
MASTER YOUR MIX WITH TC MASTERX	14

TC WORKS is a TC Electronic company dedicated to designing and developing TC-quality products for computer-based audio workstations. We want to supply you with the best tools to get the job done while offering you superior audio quality and unprecedented ease of use. We would like to encourage you to get in touch with us and let us know your needs. Help us to help you!

WE ARE IN IT FOR THE TOOLS, NOT THE TOYS!

How to contact TC WORKS

E-mail us at info@tcworks.de

For technical support please have a look at the customer support sheet or visit our website: www.tcworks.de

Or if you prefer more “traditional” methods of communication, here are the details:

TC Works Soft- & Hardware GmbH
Flughafenstrasse 52B
D22335 Hamburg
Germany
Phone: +49.40.531 08 30
Fax: +49.40.531 08 31

TC | WORKS is a **t.c. electronic** company
ULTIMATE SOFTWARE MACHINES ULTIMATE SOUND MACHINES

COPYRIGHT © 1998-2001 BY TC WORKS SOFT- UND HARDWARE GMBH. TC MASTERX AND TC POWERCORE ARE TRADEMARKS OF TC WORKS SOFT- UND HARDWARE GMBH. ALL OTHER PRODUCT AND COMPANY NAMES ARE TM OR ® TRADEMARKS OF THEIR RESPECTIVE HOLDERS. ALL SPECIFICATIONS SUBJECT TO CHANCE WITHOUT NOTICE. ALL RIGHTS RESERVED.

Congratulations on your purchase of TC Works' MasterX3, which will provide you with a powerful tool to master your audio material in your native recording environment, equipped with TC PowerCore.

TC MasterX's new approach to multiband expansion/compression/limiting makes total recall of your favorite dynamics settings finally come true, combining all aspects of dynamics treatment in one Plug-In!

Our *visual effect interpretation* groups all seemingly abstract parameters and presents them in an intuitive graphical manner. What's more, the innovative Target Meta-Parameters have allowed us to significantly reduce the parameter "flood", normally found in such multiband dynamics processors.

You will find a **Hands-On workshop** in this manual, which will guide you to use this Plug-In in a mix situation step-by-step.

So if you normally stop reading manuals on this page, we strongly recommend to go through the workshop once. It should answer most of your questions before you even knew what you wanted to ask!

And now put on your musical pair of glasses – and ENJOY!

The TC WORKS Team

MacOS



System Requirements

In order to use TC Master X3 on your Mac You will need:

- PowerMac G3/233 or better
- 128 MB RAM
- MacOS 9.01 or higher
- TC PowerCore board
- VST or MAS compatible application



Installation

Run the TC MasterX installer from the installation CD and follow the instructions on the screen.

Please also refer to the TC PowerCore manual on how to install and use TC PowerCore Plug-Ins in your VST/MAS compatible application.

Factory Presets

TC MasterX comes with factory presets. These presets were designed by audio professionals who created them in real-life sessions. The presets are extremely useful to get started quickly, and some users might even feel no need to edit them!

Preset Handling

The presets are handled in the same way as the presets of other plug-ins are handled in your host application. Please refer to your host application's manual for details.



Plug-In Automation

The TC MasterX parameters can be automated, in case your host applications supports automation. Please refer to your host application's manual to check if and how Plug-In automation works.

Generic Controls

Before we get into details, here are some basic methods for operating TC MasterX.

Fine Trim Mode

If you press the <CONTROL> key while you're moving a fader, you will get into a Fine Trim Mode. This mode allows you to edit values with extra-high accuracy!

Reset

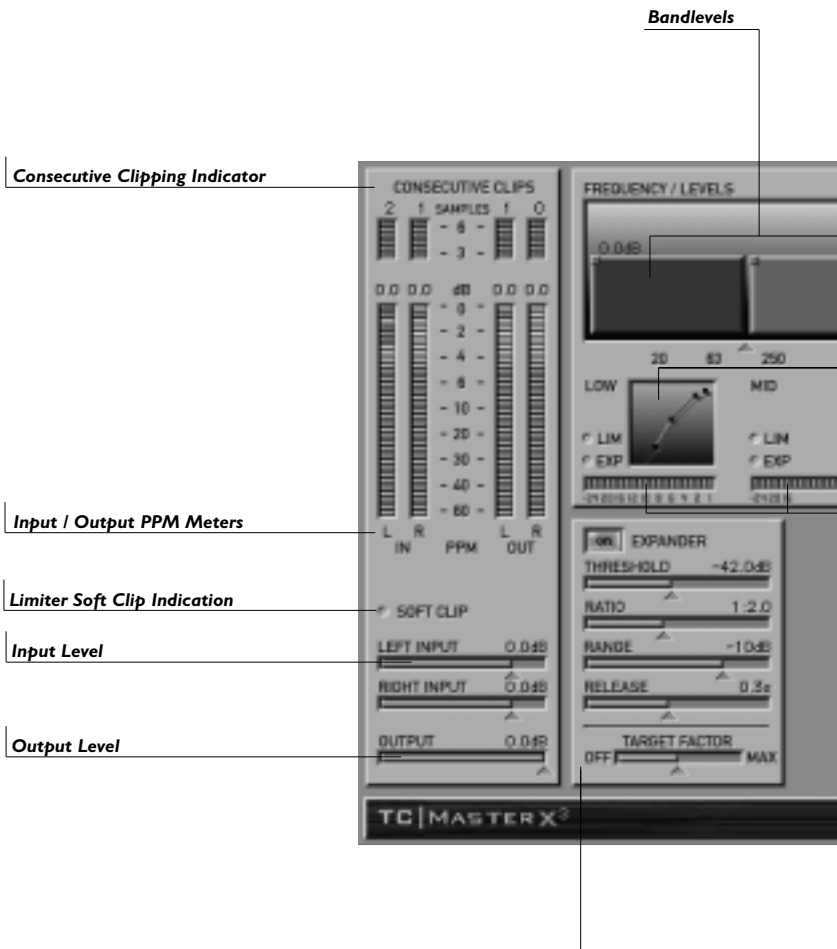
If you want to reset a parameter to its default value, hold the <OPTION (ALT)> key while clicking on the fader.

Group / Ungroup

To group / ungroup faders, for example the band levels or the input faders, hold the <SHIFT> key while moving the fader(s).

Inactive Controls / Use of color

Inactive controls are grayed out, color signals active controls! In bypass mode all controls are grayed out.



Crossover Frequencies

Look-ahead Delay

Output Dithering

Target Curve

Displays for •
Low / Mid / High band / solo buttons

Compressor reduction meters

3-Band Limiter Controls

3-Band Compressor Controls

3-Band Expander Controls

The image shows a detailed view of the TC|MASTERX3 software interface. At the top, there are crossover frequency controls for Low (L), Mid (M), and High (H) bands, with values of 1.25 kHz and 2.75 kHz. Below this is a frequency response graph showing 0.0dB gain across the spectrum. The interface includes a 'LOOK-AHEAD DELAY' set to 5ms, 'DIGITAL CEILING' at 0dB, and 'OUTPUT DITHER' set to OFF. A 'TARGET CURVE' section shows a 'HYPER' curve. The bottom half of the interface is divided into 'COMPRESSOR' and 'LIMITER' sections. The compressor has a threshold of -12.0dB, a ratio of 2.5:1, an attack of 2ms, and a release of 0.2s. The limiter has a threshold of -3.0dB, soft clip at 10%, and an attack of 2ms. Both sections have a 'TARGET FACTOR' control ranging from OFF to MAX. The TC|WORKS logo is visible at the bottom.

Meters & Consecutive Clippings

Meters

These PPM meters (Peak Programme Meters) include a very accurate Peak Hold function. Set your levels as close to 0 dB as possible, without distorting the signal. The numerical peak display gives you the exact reading you require for that.

Clicking on the meters will bring up a pop-up display with a variety of meters options.

Consecutive Clippings

The CONSECUTIVE CLIPPINGS display is a highly accurate tool which will display any and all clips in your material. The numerical reading even counts single clips, the meters give you an additional visual feedback after the 3rd consecutive clip.

Like in the METERS display, clicking on the clipping meters will bring up a menu with a variety of options.



Left & Right Input

Adjust the signal so you leave the smallest possible headroom and get the compressor working. The separate faders for left and right channel assist you in fixing level differences between the channels.

To ungroup the faders, hold the <SHIFT> key on your computer keyboard while moving a channel fader.



Output

Sets the Output level. Make sure you set the OUTPUT LEVEL properly, i.e. make sure there are no clips displayed in the OUTPUT METERS.



NOTE: Output-Clips are only displayed, if DIGITAL CEILING is set to 0 dB.

Frequency / Levels

Here you set the crossover frequencies and compressor gains for the 3 bands.

You could adjust the crossovers by clicking / holding in the numerical fields and moving the mouse to left/right. A third possibility is to click into one of the three blocks and move the mouse to left/right. The minimal bandwidth of a band is 2 octaves. The gains are adjusted by clicking into one of the 3 blocks and simultaneously moving the mouse up or down. The exact gain is displayed numerically right above the block.



Holding <SHIFT> while dragging, will allow for simultaneous level editing when moving the mouse up or down.

Holding the <OPTION> key while clicking on a band block, will reset its gain value to 0 dB.

Holding the <OPTION> key while clicking on the background, will reset all bands.

Displays LOW / MID / HIGH

These displays give you a visual feedback on the dynamics processing applied to each band. Clicking on the display will activate the SOLO function, clicking again will deactivate it again.



The LEDs below the display show if the band's Expander or Limiter section are active. The Gain Reduction Meter displays how much the compressor is working on the signal.

Expander

On-Switch

3-Band Expander on/off

Threshold

Sets the Expander's threshold. Values below the threshold will be lowered in volume according to the ratio set and for the defined range.

Ratio

The Ratio determines how much the output signal will be lowered in proportion to the original signal.

Range

Range defines how far the Expander is able to lower the part of the signal which is below the set Threshold value.

For example: When you set the Threshold to -40 dB, the Ratio to 1:2.0 and the Range to -10 dB, the Expander will only work when your input signal exceeds -50 dB and doesn't go over -40 dB.

Release

Release determines the time the Expander takes to return to the original signal level.

This parameter only has an effect, when the Threshold and Range parameters are set in a way that the Expander is actually active.



Compressor

On/Off

3-Band Compressor on/off.

Threshold

Sets the Compressor's threshold i.e. above what level it starts processing. Values exceeding the threshold will be compressed.



Ratio

Determines the amount of compression, the higher the ratio the “stronger” the processing and the lower the remaining dynamics range.

Attack

The Compressor's attack time determines how fast the compressor will react on signals exceeding the threshold. Shorter attack times will compress harder but might introduce a 'pumping' sound.

Release

The Release time determines how fast compressed signal returns to unprocessed, whenever the level falls below the set Threshold.

Limiter**On-Switch**

3-Band Limiter On/Off.

Threshold

Whenever the signal surpasses the set Threshold, the Limiter processes it with a ratio of “infinite-to-one” ($\infty:1$) to limit the possible maximal level.

Softclip

Softclip allows to affect the way the Limiter works. In Off position, the signal will be limited “hard” whenever the Threshold is surpassed. With Softclip active, limiting starts slightly before the set Threshold and then glides into limiting using a much softer curve, making the limiting process less audible.

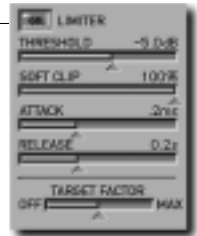
The Softclip LED beneath the Meters will indicate that Softclip is working.

Attack

The Limiter's attack time determines how fast the limiter will react on signals exceeding the threshold.

Release

The Release time determines how fast the limited signal returns to unprocessed, whenever the level falls below the set Threshold.



Look-ahead Delay

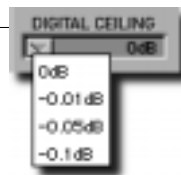
MasterX can look into the future, whenever this parameter is active! This won't help you fortune-telling, but it'll help MasterX to be prepared for sudden peaks in your material, thus ensuring a much better quality processing!



Digital Ceiling

Digital Ceiling will let you define a marginally lower level than 0 dB as maximal value, so you can ensure that you definitely don't have any values reaching 0 dB.

This can be important for mastering – as some devices already show a clip or overload, when 0 dB is reached for one single sample – others take up to 5 or more consecutive clips before they display an overload.



NOTE: Do not activate Digital Ceiling before you have adjusted the setting to your liking – MasterX won't display clips with Digital Ceiling active!

Target Curve & Target Factors

The Target Curves and Target Factors simplify the handling of MasterX significantly, by reducing the amount of parameters necessary to control the Plug-In by approximately 2 / 3. Thanks to these innovative parameters it will be easy for you to keep an overview of all relevant settings at all times – and get to a result fast anyway!

Although you are using a 3-Band solution you only have one set of parameters for each module. This is possible due to the use of the Target Meta-Parameters:

The displayed values are always referring to the center band, with Target Curves you define the basic “focus” (like “all equal” or “less treble” etc.) as displayed by the little curve in the Target Curve display – and with the Target Factor you can edit that “focus”, move the target elsewhere in the frequency spectrum.

Target Factor

The Target Factor allows fast editing of the relation between the 3 bands, separately for each module. For example: with just one move of the Target Factor in the Limiter block, you can increase the focus of the Limiter block on the hi frequency spectrum.



In OFF position, the Target Factor is deactivated for the module – all 3 bands will be processed with the setting you see on screen. In MAX position, the selected Target Curve will be applied to the maximum – and the 3 bands will be processed differently.

So in a way you could say: The Target Factor determines the amount of differences between the bands.

Target Curves

The Target Curves determine how the 3 bands work together:

Linear

All 3 bands are processed equally. The Target Factor has no effect. (imagine the frequency characteristics of white noise)



Pink

The Hi band will be processed less. (imagine the frequency characteristics of pink noise)



Hyped

The Hi band will be processed more.



Smiley

Lo and Hi band are processed more.



Master your miX with MasterX!

...or six easy steps to ultimate happiness! The following chapter introduces the various modules and features of MasterX in a “hands-on” tutorial.

Let’s imagine we’re working with some rock music. It’s the final mix from that very expensive recording studio down the road, but for some reason there is 5.0 dB of headroom left, wasting precious volume reserves. No compression was applied to the stereo mix. (Actually, we are happy about this because it leaves all options open).

1. Setup

Before we start, let’s set up MasterX3 as follows:

LOOK AHEAD DELAY:	3 ms
DIGITAL CEILING:	0 dB
3 BAND LEVELS:	0 dB
OUTPUT:	0 dB
EXPANDER:	OFF
COMPRESSOR:	OFF
LIMITER:	OFF
TARGET CURVE:	LINEAR

(Alternatively, load the Preset “Manual Workshop 1.”)

2. Input Level Adjustment

Set the input level for both channels to +5.0 dB. In our example, this will bring the input level up to an optimal value of 0 dB. Adjust this value until no clipping is indicated (i.e., until there are no Consecutive Clips in the input). For this example, set it to +4.9 dB.

Remember: as long as you don’t alter any settings in the signal chain before MasterX, you won’t get any changes in the input level, so there is no risk of clipping once you’ve set the level correctly!

3. Turn on the Compressor block

The FREQUENCY / LEVELS display in the upper-half of the Plug-In window, the three displays beneath them, and the Compressor’s parameter faders come to life! The music has probably come up in volume already, and the sound has changed a little too – and perhaps some “pumping” is evident. So, let’s set the Compressor properly to get rid of the pumping, beef up the overall sound, and, yes – we want it louder!

(Alternatively, load the Preset “Manual Workshop 2.”)

Let's set the Attack and Release Times to remove the "pumping" from the sound. We start with small values for both parameters. If the attack time is too short, we may remove some "kick" from the material. That's certainly not what we want, so if it happens, try a greater value. Heavy peaks can be smoothed using the limiter section.

If the release-time is too fast, it will result in a terrible "pumping," because the compressor returns to the uncompressed signal immediately whenever the signal falls below the compressor's threshold setting. Increase the value of the release time until you are satisfied with the result. In our example, we have chosen an Attack time of 1ms and a Release time of 0.2 s. If you don't get the desired result, try some different crossover frequencies. Keep in mind that you have three independent bands – why should a bass drum signal affect the mid and high bands when its peak is in the low end? (We chose 125 Hz and 2.5 kHz as the settings for our example.)

NOTE: Sometimes it's easier to adjust the Attack and Release times and the Crossover frequencies by using extreme values for Threshold and Ratio during setup. This will make the effect of your settings much easier to hear. Additionally, the band SOLO-Function helps to focus on a single band.

Now we will adjust the compressor's threshold and ratio. Set these parameters to the desired values. In most cases, you would use a low threshold in combination with a small ratio and vice-versa. Let's choose a low threshold of -20 dB and a small compression ratio of 2.5:1 to be satisfied.

Satisfied? Why be satisfied? We have now set the compressor – but with identical settings for all three bands! With identical settings, we are not taking full advantage of the multiband capabilities. This is where the famed Target Curves and the Target Factor come in.

The Target Curves create different settings for each of the three bands. The displayed values in each fader section are always the mid-band settings. If the Target Curve is set to "Linear" (or if the Target Factor is set to "Off"), the values will be identical for all three bands. If you select the "Hyped" curve, for example, the high band will be compressed more than the others.

The Target Factor defines how much the target curve characteristics will influence the hi or low band. To set the Target Curve and Factor properly, we recommend that you compare the processed signal with the uncompressed, because you can use it to change the overall sound impression. Does your mix lack treble? Use the "Hyped" curve and adjust the target factor to your liking. Too bright? Select "Pink" and adjust the target factor. Not enough treble and bass? Go for "Smiley" and you'll be smiling too!

To get a better impression of how the sound – as opposed to the output volume – is influenced by MasterX, reduce the output level so the bypassed and processed signals are equally loud – but don't forget to bring the output level back up in the end!

The band levels in the upper display supply you with an additional tool for easily adjusting the sound of your mix. Use them like a low, mid, treble EQ!

(Alternatively load the Preset “Manual Workshop 3.”)

4. Activate the Limiter

We've pumped up the volume and reduced the dynamics to optimize the sound and to make it more compact and “punchy.”

But there's something really nasty that can happen when you work with digital audio: digital clipping. If you have more than one tiny sample clip, your whole master will be worthless for serious use – such as putting the music on CD.

That's why there is a Limiter block in MasterX. It ensures that you get only the levels you want, and eliminates the ones that would not only spoil your day but also your whole mix!

You should use the Limiter carefully, as a limiter is always a somewhat “drastic” tool to apply to your audio. Just a couple dB should be enough to limit strong peaks. Softclip will help the limiter work even more smoothly.

For our example we have chosen a threshold of -4 dB and a Softclip of 20%. The Attack Time is short (50 μ s), so the Limiter is capable of preventing clips. The release time is set to a value that avoids unwanted pumping (0.3 s).

Set the target factor in the same way you set the compressor. Trust your ears (and the Consecutive Clips meters) to judge whether a band needs more limiting.

(Alternatively load the Preset “Manual Workshop 4.”)

5. Expand!

By compressing the signal we made it sound louder. However, an unwanted side effect is that the ground floor level is also brought up (which may cause you to remark, “Where did all that noise come from?”). The noise will be most evident in the pauses.

The Expander is one possible cure for this. (Obviously, the Expander can't replace broadband noise reduction – but it will reduce audible noise when applied to vocal tracks, for example.)

Use the Expander carefully. The modulated noise of the ground floor level is much more audible than a higher ground floor level without such modulation.

The Expander's threshold must be lower than the compressor's threshold. If you raise it too much, you might cut into low parts of the signal, such as reverb tails.

The Expander's range parameter determines the width of the level range. Also, the target Factor enables you to determine whether to apply different settings to all three bands, and if so, just how different the settings should be!

(Alternatively load the Preset “Manual Workshop 5.”)

6. Adjust the Output Level

We are almost finished – just one parameter left: the Digital Ceiling. Set this parameter to a value lower than 0 dB to prevent unwanted clipping.

The most common value is -0.01 dB. With this setting, the maximum output level is -0.01 dB. No portion of your signal will be able to pass this absolute setting. Now you can be absolutely sure that there is no clipping – and the difference from 0 dB will be imperceptible.

NOTE: If you want to further edit your settings, please make sure that you first switch the Digital Ceiling back to 0 dB. Otherwise, you won't be able to tell if there are internal clips!

(Alternatively load the Preset “Manual Workshop 6:Final”)