TAP FACTORY

MULTI-TAP DELAY

tc electronic

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GETTING STARTED

Scroll Wheel Support

If you are using a host application that supports this feature, all parameters support scrolling on both Windows XP and Mac OS X. Simply place the mouse over a parameter value field and use the Scroll Wheel to increment/decrement the associated parameter-value.

Key Commands

In most host applications, plug-ins support keyboard commands for certain functions. The following key commands are available for all plug-in parameters.

Key Commands in Mac OS	Key Commands in Windows
Reset To Default = Alt	Reset To Default = Shift & Control

DSP USAGE

For each open instance of the Tap Factory on PowerCore devices (Express, PCI mkII, Unplugged, Compact, FireWire, X8 and PowerCore 6000), the following DSP usage applies:

Full version

@44. 1 kHz:	@48 kHz:	@88. 2 kHz:
DSP 66%	DSP 72%	DSP 93%
MEM 100%	MEM 100%	MEM 100%

LE version

@44. 1 kHz:	@48 kHz:	@88. 2 kHz:	@96 kHz:
DSP 48%	DSP 53%	DSP 76%	DSP 83%
MEM 25%	MEM 25%	MEM 25%	MEM 25%

Tap Factory – Multi-Tap Delay

Transcend the Average Delay – A Tweaker's Paradise

Let your creativity run wild with this delay/reverb hybrid. Easily design custom out-of-this-world effects that cross the borders between Ambience, Early Reflections, Reverb and Delay.

Tap Factory makes customization of your sound a breeze and brings radical signatures to your productions. Tap Factory's extremely intuitive and clean user interface allows you to make individual parameter settings for each of its 24 taps within seconds.

Tap Factory includes a bonus LE version that allows you to run multiple instances per DSP on current PowerCore systems and supports first generation PowerCore hardware.

Differences between Tap Factory and other delays

In many aspects, Tap Factory is a fairly normal delay-unit: What comes in goes out again a bit later. What sets Tap Factory apart from other delay-units is the way it can alter the delayed sound and its ability to create very short and precise delay times.

Tap Factory covers common delay parameters like delay time, level and panning. Additionally you will find the parameters Shade, Feedback and Phase. Feedback is common to most multi-tap delays and echo-units, but as you will discover the way the feedback works in TF is rather unique.

When you hear a natural echo, you do not hear an exact representation of the original sound. The sound is obviously a little weaker in level, but it is also altered in a few other ways: The sound is diffused, and the timbre has changed. And this effect is what the "Shade" parameter recreates: timbre and diffusion of the delay taps.

If a sound hits a plaster wall, the resultant echo has a small dip in the high and low frequency, but the amount of diffusion is very low and almost nonexistent. If the same sound hits a rock face, the echo will have a lot of diffusion because of the surface structure of the rocks, but there will only be very subtle coloring of the sound. Every material has its own "audio-fingerprint" so to say, and that is why the sound in a bedroom is different from the sound in an office even when the two rooms have the same size and proportions. The "Feedback" parameter is routing a portion of the signal back to the start of the delay-tap-chain. However, please exercise caution when setting up Feedback as the overall level can get really loud!

Creating 3D delays

The Phase parameter can be used to simulate three-dimensional sound. If you set two delay taps to the same delay time, set the Pan for each to the widest position possible,

and turn the phase for one of the taps, you will get the illusion of the sound coming from behind you. Like other phase-turning tricks, this one works well, although it is not usable in mono – the tap will simply disappear. But this trick can be employed even if the delay times are not exactly the same. In that situation, you will get a more subtle 3D effect, which also works in mono. In general, it is somewhat difficult to predict the results of turning a tap's phase. But if you for instance have a lot of very narrow delay times set up, and they are creating a nasty comb filtering effect, try to flip the phase of some of the taps. This will often clear up the problems.

Creating a "natural" room ambience

If you wish to create a natural ambience, you need an application to calculate the reflections (delay taps) in the room you wish to simulate. The reflections depend on the room's shape and size and on the position of both the sound source and the "listener". The color of the reflections will depend on the different surfaces in the room, and their precise absorption coefficient. By calculating these reflections, you can create a very natural audio environment. However most of us do not have such an application, so we must rely on a few rules, a rough estimate – and our ears.

A few "rules of thumb": Sound travels at 340 meters per second in air. We also know that by doubling the distance to a sound source, its sound pressure level (SPL) will be reduced by 50%.

Example:
The sound source is 5 meters away from you and its SPL is -4 dB. You now move the sound source 5 meters further away, so it is now 10 meters away from you. The SPL will now be -8 dB.
Furthermore sound pressure will decrease 0.03 dB/m just by traveling in air.

These facts can help us creating credible ambiences.
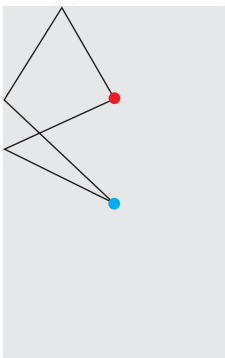
An example: The sound source is in a room 4 meters wide and 8 meters long, and it is located 2 meters from the back wall and centered between the two sidewalls. The distance between the source and the microphone is 4 meters. The exact calculation of all the reflections in this example will take quite a bit of time, a spreadsheet and good old Pythagoras to get right.

But you can also do a rough estimate: The first sound hitting the microphone is the direct signal. This will have a level of 0 dB and an angle of 0 degrees.
The subsequent reflections to reach the microphone will be coming from the floor and the ceiling. However we can leave them out since these reflections are very close to the direct signal, they are very loud, and they often create an ugly comb filtering effect. The reflections from the walls are next: The sound travels 2.8 meters before hitting the wall between the source and the microphone. Then it travels another 2.8 meters from the wall before finally hitting the microphone. That is a total of 5.6 meters, equaling 16 to 17 ms. The angle is likely about 45 degrees left. Since the sound traveled nearly three times the distance of the direct signal, you should turn the level down about 9 dB. Now add 40 % Shade to the tap and go to Shade-Settings. Here, you set the Diffusion to "Normal" and make a dip in the high frequencies with the EQ.
Now you can create a new reflection just like this one, with only tiny variations in delay time and level, and let it arrive from the other side – for instance, at an angle of 40 degrees from the right.

The next wave of reflections arrives from the wall behind the sound source. Some reflections will hit the back wall first and then the sidewall before hitting the microphone. Try to continue the calculations by yourself. Look at the illustration. If you think the room needs a little extra, try to flip the phase on some of the taps. You can also try to add some Feedback to some of the taps.

Classic echo – with a twist

If you wish to simulate a classic tape-echo effect, you can benefit from the Shade parameter. Create a delay with one tap, turn the Feedback up to 80 % and set Shade to 50%.

On the "Shade Settings" tab, set Diffusion to "Normal". Next, turn the EQ's high band and low band down until you get a soft and diffused sound. This kind of delay will often blend much better in a mix than clean, unaltered delays. And in echo-heavy genres like dub, you will in fact get closer to the original tape-echo sound by using "Shade".

Enjoy!

1 – Undo/Redo up to 20 changes

2 – L/R Mirror function

3 – Shade Factor

4 – Feedback Factor

5 – Delay Multiplier Factor

6 – Apply button for Delay Multiplier

7 – Input level trim knob

26 – Tool Tip function

25 – Tools – Selection, Crosshair and Freehand

24 – Select Tap mode (Tempo or Rhythm mode)

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8 – Panic button

9 – Screen selectors: All Taps or Shade Settings

10 – Meters

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12 – Wet/Dry mix knob

27 – Lock option

L/R PATTERN
MIRROR

SHADE FACTOR
x 1.00

FEEDBACK FACTOR
x 1.00

DELAY MULTIPLIER
x 1.00

APPLY

PANIC

INPUT
0.0 dB

TAP MODE
TEMPO RHYTHM

TAP PAD

TEMPO
120.00

TEMPO SYNC
N/A

DELAY FORMAT
BPM MS

GRID
1/256

RANDOMIZE
GO! 0%
All Parameters

ALL TAPS   SHADE SETTINGS

ZOOM D x1 x2 x4 x8

LEVEL   PAN   FEEDBACK   SHADE   PHASE

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

201.0 ms   0.0 dB   Center   100%   100%   0°
DELAY   LEVEL   PAN   FEEDBACK   SHADE   PHASE

PRESETS
FILE   Tapish Delay   A B   RESET

TAP FACTORY   Ver. 1.0.1   t.c. electronic

0
-3
-6
-12
-18
-24
-30
-40
-60
L R   L R

0.0 dB

OUTPUT
0.0 dB

DRY   WET
MIX

15 – Selection tabs for parameter pages

14 – Tap select

Preset handling
(See chapter on preset handling)

13 – Adjust knobs for Individual Delay Tap parameters

1 – Undo/Redo

The Tap Factory is a tool with endless possibilities – so don't hesitate to experiment and be creative. If something goes wrong, you have up to 20 undo steps. Undo/redo also includes the randomization and A/B functions.

2 – L/R Mirror

The L/R MIRROR button is a toggle that mirrors the delay-tap pattern at the Y-axis (Left/Right).

NOTE The pattern is mirrored instantly. The status of the button is not saved as part of a preset (while of course the consequences of having the key pressed are stored).

3 – Shade Factor

The Shade settings set on the Shade Settings page are global settings. However, with this multiplier it is possible to increase or decrease the effect of Shade settings on each delay tap.

4 – Feedback Factor

Feedback can be set for each tap individually. However, with this multiplier it is possible to multiply the current feedback settings on all taps at the same time and thereby adjust the individual taps relatively. Notice that when the feedback-sum is above 100 %, the indicated feedback percentage and the feedback factor turns red. Read more on page 19.

5 – Delay Multiplier

This parameter multiplies the value of the 24 individual taps. The "x 1.00" setting means: "What you see is what you get" when monitoring the delay settings.
If you set the Delay Multiplier knob to another value than "x 1.00" and press "APPLY", the individual tap-delays are updated to the calculated delay-time, and the delay multiplier is reset to "x 1.00", indicating that again the shown tap values are what you hear.

6 – Apply button for Delay Multiplier

When you press the "APPLY" button, all taps are recalculated according to the Delay Multiplier factor, and the Delay Multiplier is reset to "x 1.00".

7 – Input level trim knob

Use this knob to adjust the input level by monitoring the input meters.

8 – Panic button

If you have set too many taps with too high a feedback setting – this button may be handy. It will stop all delay taps immediately.

9 – Screen selector

Select either "All Taps" or "Shade" Settings.
Via the "All Taps" screen and its sub-pages (Level, Pan, Feedback, Shade and Pan) you have full individual parameter control of all taps.
On the "Shade Settings" screen you can set attenuation of any frequency area. The attenuation is applied to *all* taps.

10 – Meters

Meters on the left are input meters and meters on the right are output meters.

11 – Output level knob

Controls the output level of the plug-in. Normally, you will set this to 100 % and control the level of the delays in your host software.

12 – Wet/Dry mix knob

Use this knob to set the mix between the wet and dry signal components. When using the plug-in as a send effect, use the 100 % wet setting. When you use the plug-in as an insert effect, you can use the wet/dry mix to set the effects level.

13 – Delay, Pan, Feedback, Shade & Phase parameters – and how to adjust these.

These parameters can be set for each individual delay tap. There are two basic ways of adjusting the parameter values:

Adjusting a single tap:
Either click on the graphical indication of a tap using the arrow tool or click on tap numbers 1 to 24 ▪1▪2▪3▪4. Then use the knobs to adjust the individual delay parameters.

Adjusting several taps:

When you would like to adjust e.g. the Level or the Pan or Feedback for several taps, you can use the Crosshair ▣ or the Freehand ▣ drawing tools in the area where the parameter values are displayed.

When you select the Crosshair tool ▣, you can draw in straight lines while pressing the left mouse button. This is an excellent tool e.g. for creating a smooth fade-out over the taps on the levels page.

The freehand tool ▣ only changes the value of the bar it currently touches.

We suggest you try out both tools and get comfortable with this intuitive way of entering values.

Parameter Page Examples

Level page:

Pan page:


Feedback page:

Shade page:

Phase page:

14 – Tap select

There are 24 Direct Tap select buttons representing the 24 taps. You can also select a tap simply by grabbing the tap in the grid.

15 – Selection Tabs for Parameter Pages

Although all delay tap parameters can be set using the six parameter knobs, you will get a better overview for each parameter category by selecting the parameter pages. To select the page for a parameter (e.g. Pan), press the associated page tab right below the page area.
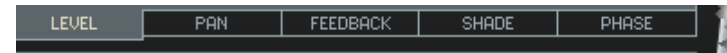
16 – Parameter Randomization menu

Use this drop-down menu to select one or more delay parameters to randomize.
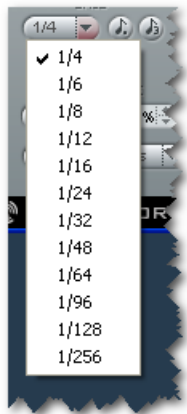
17 – GO! (Activate randomize)

Press "GO!" to activate the randomize feature.
With the randomize feature a given set of parameter values can be randomized.

18 – Delay Grid settings

Delay taps can be set at random or in a grid. A grid consists of a simple sub-division, such as 1/4, 1/8 etc., or a sub-division combined with a "dot" or "triplet" value.

Dotted or Triplets
Press these buttons to set the grid to either dotted or triplet notes.

19 – Delay Format: BPM or milliseconds

The tempo can be indicated in beats per minute (BPM) or milliseconds. If you change the delay format from milliseconds to BPM, the delay time for each tap will be quantized according to the selected grid. If you do not want this, simply click the UNDO button.

20 – Tempo Sync on/off

When you set this parameter to "On", the plug-in's tempo will be synchronized to the host tempo. If you set it to "Off", its tempo can be set independently from the host.

21 – Tempo indicator

The tempo is displayed either in BPM or milliseconds. If you set the Tempo Sync parameter to "On", this field will always indicate the current tempo of the song. When Tempo Sync is set to "Off", the tempo of the Tap Factory can be entered directly here. Click on the small up/down arrows to increase or decrease the tempo in 1 BPM steps.

22 – Tap Pad (for Tempo or Rhythm tap)

Depending on the selected Tap mode (see 24) you can enter either the global tempo or a rhythm by tapping this button.

23 – Zoom Factor buttons

Zoom tool for the grid allows you to zoom and do fine adjustments.

24 – Tap Mode

Tempo mode:
In Tempo Mode, you can enter the global delay tempo by rhythmically clicking (tapping) the Tap Pad. Typically you will tap the tempo in quarter notes. Tapping two times is enough, but tapping more times will increase the accuracy (as Tap Factory calculates the tempo as the average of *all* the taps, not just the last two).

Rhythm Mode:
In Rhythm mode you can enter delay taps as a rhythm.
The restrictions are that you can set a maximum of 24 taps within 9 seconds.

25 – Tools

Three different tools are available for setting and adjusting parameter values directly in the tap display. One tool is always selected. To switch between the tools, simply click one of the three icons.

Selection tool: This is the default selection tool. Use it to select a single delay tap by clicking on the tap. To select *multiple* taps, press and hold the left mouse button and drag the tool around several delay taps.

Crosshair tool: This tool can be used to adjust parameter values by drawing straight lines in the tap display.

Freehand tool: This tool can be used to draw parameters freely in the tap display.

26 – Tool Tip function

Activate or deactivate the Tool Tip function. When activated, various tool-tips will be presented when you hover the mouse over various buttons and functions.

27 – Lock Option

When trying out different presets it may be an advantage to keep your Input, Output and Mix settings. Therefore you can lock these parameters individually so that their current positions are kept when loading a new preset. Click on the padlock to lock/unlock.

SHADE SETTINGS

The Shade settings basically define a 3-band parametric EQ that is applied to all delay taps.

You can, however, use the Shade Factor parameter (see 3) to apply more or less of the Shade settings to the individual delay taps.

Please notice that the sound resulting from your Shade Settings will vary depending on the setting of the Diffusion knob.

You can use an external MIDI controller (e.g. a MIDI keyboard) to intuitively set the values for taps, velocity, panning and shades settings.

Let's take a look at a few examples based on Cubase LE4 as VST host. Just like any other plug-in, the Tap Factory can be used either as an insert effect on a track or as a send effect. To use Tap Factory as a send effect, insert it on a FX Channel track and then send signals to this track from your source tracks. We will use the FX Channel track method in this example.

• Create an FX Channel track and insert Tap Factory on this track.

• Create a MIDI track. Select you MIDI keyboard or controller as MIDI In for this track. A USB keyboard could e.g. be labeled USB Audio Device. Set this track's MIDI out to "Tap Factory".

To be able to enter controller data into Tap Factory you should now:

• In Cubase, select the MIDI track
• In Tap Factory, set the Tap Mode to "Rhythm Mode".

Entering delay taps

You can now use any key on the keyboard to enter delay taps in a pattern of your choice. Limitations are 9 seconds of delay for all taps summed and a maximum of 24 taps. After 24 taps have been entered or 9 seconds have passed, Rhythm Tap mode is deactivated.

> **NOTE** It is easy to enter too many delay taps with too much feedback and thereby create a feedback overflow. If you need to reset all taps, just press the PANIC button.

Adding pan and shade information to delay taps

While entering delay taps, you can also enter pan and shade values using the controllers on your MIDI keyboard. Use the Pitch wheel to set pan values and the Modulation wheel to set shade values. Simply turn the wheel as you tap in the delay taps.

When entering Shade curves as described above, Low, Mid and High bands must be selected before you start entering taps and turning the modulation controller wheel. Go to the Shade Settings page and click on 1 for low-band, 2 for mid-band and 3 for high-band.

You set the volume/velocity for the delay taps simply by hitting the keys harder or softer while tapping.

Per default, the tap tempo is assigned to any key on a keyboard. However, it is possible to assign any MIDI controller to the tempo tapping function. MIDI keyboards often have dedicated CC buttons for such functions.

- Connect the external MIDI device that you want to use for controlling the tempo to the MIDI In jack on your MIDI interface.
- In Tap Factory, right-click the red Tap Pad and select "Assign MIDI controller".
- Then press the particular MIDI controller on your MIDI device that you would like to use for tapping the tempo. That's it!

- To un-assign the currently assigned MIDI controller, right-click the Tap Pad and select "Unassign MIDI Controller".

FEEDBACK HANDLING

With 24 taps of up to 9 seconds of delay and up to 100 % feedback on any tap, it is fairly easy to create settings that will result in an unwanted feedback-sum above 100 %.

When the feedback-sum is above 100 %, the indicated feedback percentage and the feedback factor turns red.

Example: OK   OK

NOT OK   NOT OK

As previously explained, you can always press the PANIC button to reset all delay taps.

SOLO TAP LISTENING

If you want to listen to a single delay tap, use the solo function.

On Windows: Press and hold they CTRL key and click on the relevant tap number (1 to 24) to solo it.
On the Mac: Press and hold the SHIFT key and click on the relevant tap number to solo it.

Several taps can be selected for solo listening.

MUTE

If you want to mute a single tap, use the mute function.

On Windows: Press and hold the ALT key and click on the relevant tap number (1 to 24) to mute it.
On the Mac: Press and hold the COMMAND key and click on the relevant tap number to mute it.
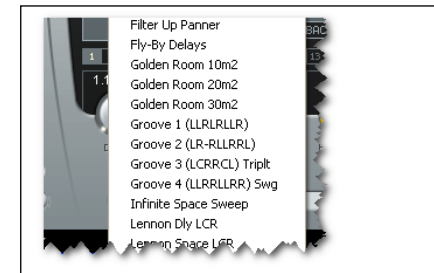
You can mute several taps.

INTRODUCTION

We recommend using the dedicated PowerCore file handling system that (apart from recall; store and compare facilities) allows for easy exchange of entire preset folders with other users, between Windows/Mac platforms and also between different host applications.

File

Click the FILE button to open the File menu.

Load Preset: Select to load presets from the default preset location.

Save Preset: Select to save the preset in My Presets folder.

My Presets: Via "My Presets", you can load you own presets.

If you chose to store presets in other locations than the "My Preset" folder, these presets will not appear in the "My Preset" drop down menu. However, you can still navigate to, and load these presets via the Load Preset function.

Preset name

This is the name of the preset.

Up/down

The UP/DOWN arrows can be used to browse through all presets.

A/B

With the A/B compare function you can easily compare different parameter settings when working with the plug-in.

PRESET HANDLING

When you start working with your preset, the A/B button is grayed out. This state indicates that the settings in both memory locations A and B are identical – so there is actually nothing to compare.
As soon as you touch one of the parameters, the memory location "A" will be active. All parameter changes will be applied to memory location "A". If you switch to memory location "B", you go back to the starting point, and all further changes will now be applied to memory location "B".
Every time you press the A/B button, you will toggle between these two memory locations.

NOTE: The A/B memory locations are temporary settings only! Saving a preset will save the currently selected memory location only. The setting of the other (hidden) memory location will not be saved!

Reset

Press "Reset" to clear memories A/B and return to the originally recalled preset.

DEFAULT PRESET LOCATIONS

The following locations will describe where you can find the presets, which are stored in a folder unique to each plug-in:

Mac OS X preset paths:

<u>Factory presets</u>:
‹Macintosh HD›/Library/Application Support/TC Electronic/‹plug-in name›/Presets/

<u>User presets:</u>
/Users/‹user name›/Library/Application Support/TC Electronic/‹plug-in name›/Presets/

Windows preset paths:

<u>Factory presets</u>:
C:\Program Files\TC Electronic\‹plug-in name›\Presets

<u>User presets:</u>
C:\Documents and Settings\‹your user name›\My Documents\TC Electronic\‹plug-in name›\Presets

- To delete a preset file, simply move it to the "Trash" or "Recycle bin".
- To create a new sub-folder that appears in the plug-in menu, simply create a new folder in the plug-in folder that resides in the PRESETS folder of the plug-ins default preset location.

NOTE: A folder will not appear in the Preset File Menu unless it has at least one preset inside!