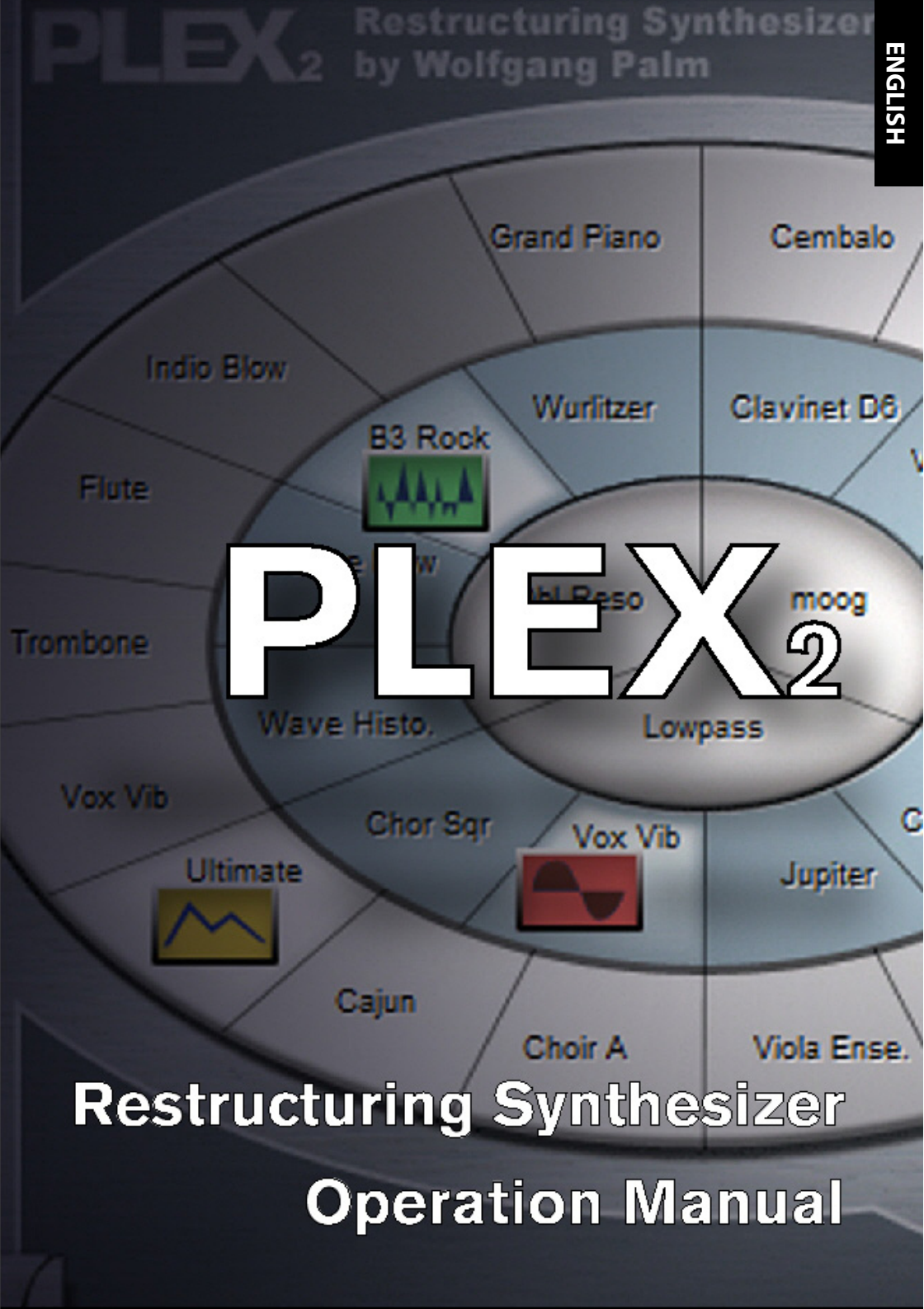
PLEX 2 Restructuring Synthesizer by Wolfgang Palm
ENGLISH
Grand Piano
Cembalo
Indio Blow
Wurlitzer
Clavinet D6
B3 Rock
Flute
PLEX 2
moog
Trombone
Wave Histo.
Lowpass
Vox Vib
Chor Sqr
Vox Vib
Ultimate
Jupiter
Cajun
Choir A
Viola Ense.
Restructuring Synthesizer
Operation Manual

PLEX 2 Restructuring Synthesizer by Wolfgang Palm
Audio algorithm and concept: Wolfgang Palm

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Operation Manual by d.popow@musicandtext.com

Table of Contents

Introduction

PLEX 2 is a Restructuring Synthesizer. It is based on a new synthesis concept that combines ease-of-use with powerful sound editing possibilities.

PLEX 2 is an upgrade to the original version, released in 2002. This VST Instrument was developed by Wolfgang Palm, the creator of the ground-breaking PPG Wave Synthesizers.

PLEX 2 has the following features:

- Reproduces all types of sound, natural or synthetic.
- More than 90 sound resources and more than 300 preset sounds including acoustic instruments, synthesizer sounds and sound effects.
- All sound resources have been transformed in a way that they fit to a common set of parameters which include well-known synthesis functions like ADSR envelopes, LFOs etc.
- Each sound resource is split into four components - called partial components or components for short. These can be combined and merged freely to create completely new preset sounds. The partial component types are called “Base” (red icon), “Top” (green icon) and “Filter” (yellow icon). The fourth component doesn’t have an icon, but you can make separate settings for it and also copy them from other sound resources.
- The “Base” component contains the basic sound (the lower harmonic sound content). The “Top” component contains the higher frequencies (the higher spectral content). The “Filter” component contains the filter characteristics that give the sound its distinctive tonal shape. The fourth component contains the level development of the Base and Top signals, i.e. the gain envelopes.
- The nature of the resulting sound depends on which combination of partial components you use.
- Simple and intuitive handling: For editing, PLEX 2 has a Sound Palette with 33 fields. You can load it with any of the available sound resources.
- Separate ADSR envelopes and individual LFOs with predefined or freely definable waveforms are available for each partial component, which lets you further control the sound of all components.
- PLEX 2 also has various global controls such as Pitch LFO, Pan, Delay etc.
- PLEX 2 is a VST Instrument. You can therefore load it into any compatible host application and use it from within that program.
- Each PLEX 2 module that you load into your host application represents a complete mono-timbral instrument with up to 64 voices and you can of course load as many PLEX 2 units as your system can cope with.

System Requirements

Please find the corresponding information on the Plex 2 page on the web:

http://plex.hermannseib.com/

Installation

- Unpack the downloaded .zip file and move the PLEX 2 folder into the VstPlugin folder of your host application.

❒ **Please note that PLEX 2 is a VSTi PlugIn, i.e. a software instrument. To use it, you need a compatible host application. A host application is a program which provides the framework that lets you open and use PLEX 2. This can be a VSTi-compatible sequencer or another VSTi-compatible program - e.g. one for live performance. You can load PLEX 2 from within the host application, edit its parameters, play it via MIDI and route its sound via the host application's audio outputs.**

❒ **If you don't have a VST host application, you can download the simple stand-alone variant SAVIHost from the PLEX 2 page on the web - http://plex.hermannseib.com/**

Setting up PLEX 2 in your Host Application

Please find the corresponding information in the sections of your host application's documentation that describe how to use VST Instruments.

Playing PLEX 2 from a MIDI Keyboard

To play PLEX 2 directly from a MIDI keyboard, you should use a sound card with an ASIO-compatible driver for the smallest possible latency time.

Please proceed as follows:

1. Connect a MIDI interface to your computer and set it up in your host application, as described in the corresponding documentation.
2. Set up PLEX 2 in your host application.
3. Select a MIDI track in your host application and set it to output to PLEX 2.
4. Connect your MIDI keyboard to an input on the MIDI interface and make sure that it receives MIDI data that you generate by playing a few notes.

   Now you can play PLEX 2 via MIDI, like any other instrument.

Using a Wheel mouse

If you use a Wheel mouse, you can use its wheel to change the sound sources as well as values of dials and faders in PLEX 2. Proceed as follows:

- Position the mouse pointer over the respective element and move the wheel up or down.

The PLEX 2 Controls

PLEX 2 has four types of control: switch buttons, dials, faders and partial component icons.

Buttons

In PLEX 2, buttons are either used to switch to another view or to select/activate a function.

Various buttons

Dials

The dials behave similar to the dials in other Cubase or Nuendo windows.

- To set a value, click on the dial, hold down the mouse button and drag around the dial in a circle. The greater the circle, the finer the value resolution.

❒ **Please note that you can use the arrow keys on your computer keyboard to change the setting of the last selected parameter. Simultaneously pressing the [Shift] key lets you change the value in smaller steps.**

- To set a dial to its default value, press [Ctrl] (Windows-PC) or [Command] (Apple Computer) and click on it.

Faders

In PLEX 2, each fader has two handles, one each for the “High” and “Low” ADSR envelope settings. Find more info on page 29.

- To set a fader, drag its handle to a new position with the mouse. To set both handles of a fader in one go, press [Alt] and drag a handle.

Partial component Icons

To create new PLEX 2 preset sounds, you can use the mouse to drag these icons between fields in the Sound Palette. Find more details on page 15.

PLEX 2 – Quick Introduction

The following sections of this manual assume that you use PLEX 2 with Cubase as your host application. If you use a different host application, please refer to its documentation for information about how to load and open VST Instruments.

1. Start PLEX 2 from the VST Instruments rack and open the PLEX 2 window by clicking the Edit (“e”) button.
2. If it isn’t selected already, select the sound bank “Introducing PLEX” in the pop-up menu at the top of the Plex window.
3. Open the D Group Preset view by clicking on the D button and select the “PLEX Piano Init” by clicking on its slot.
4. Set the output of the currently selected MIDI track in your host application so that it outputs to PLEX 2.
   How this is done, is described in the documentation of your host application.
5. Play something on your MIDI keyboard.
   As an alternative, play back a MIDI track that is set to output to PLEX 2.
6. Now use the mouse to drag the yellow “Filter” component icon onto the “Cembalo” field in the Sound Palette on the left side of the PLEXwindow.
   You still hear the piano, but this has now acquired the sound shape of a Cembalo.
7. Try dragging the yellow “Filter” component icon onto the “B3 Rock”, “Moog” or “Sitar” fields.
8. Go back to the original piano sound by clicking on it in the Group D Preset sound list.
9. Now, drag the red “Base” component icon onto the “Moog” field.
   Instead of using the Piano sound’s Base component, PLEX 2 will now use the Moog’s sawtooth type sound as the newly edited sound’s Base component.
   The sound changes and you hear the Moog´s three oscillators, but the typical piano sound remains audible, too.
10. If you drag the green “Top” component icon onto the “Moog” field, the complete Moog wave will be used. But it will still be played back with the filter settings used for a piano.
11. Finally drag the red “Base” component icon onto the fields “Voice A”, “Flute” or “Gong Harmo”.

    You have now understood the basic principle behind PLEX 2! But of course there is more.

You can completely change any sound´s characteristics by using the ADSR envelope and LFO settings and the other PLEX 2 parameters. Please read the following sections to get more information.

How this Instrument works

Basic Concept

PLEX 2 uses a new analysis/synthesis technology that has been developed by Wolfgang Palm. The concept provides the means to split all kinds of imaginable sounds into 4 components which will reproduce the original sound when applied together. The components are chosen in a way that each contains certain specific properties of the sound. These are:

- The gradual sound colour changes of the original sound over time. A time varying digital filter is used for the approximation. In the PLEX 2 program, a yellow icon represents this Filter component.
- The lower frequency spectrum of the remaining signal. In PLEX 2, a red icon represents this Base component.
- The upper frequency spectrum of the remaining signal. In PLEX 2, a green icon represents this Top component.
- The Level development of the Base and Top signals, i.e. the Gain envelopes, that you can set in the Base and Top views of the ADSR envelope section and apply to other Presets by using the Preset parameter selector fields in the Preset Group section.

Although all cover the same spectral range, the Top components of a piano sound, a violin, or a trumpet each have a different structure.

Each component only contains a certain acoustic domain. A Base component will only contain the lower harmonics of the original sound. It won't contain sound colour or volume change information. A Top component is similar, but it contains the high frequencies, instead. The time varying Filter component only contains the sound colour development over time but no other information about the remaining parts of the signal like cycle length or noise intensity.

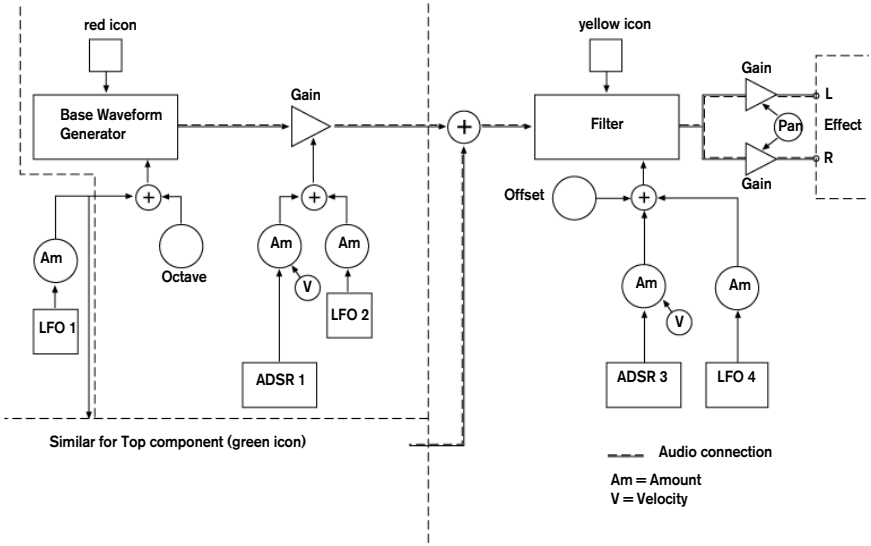
This strict separation of important characteristics makes it possible, for example, to freely interchange all the Base components with each other and still maintain a natural sound character or sound sequence, respectively.

The analysis process is quite complicated. For this reason, PLEX 2 comes with more than 90 predefined factory sound resources.

About the Signal Chain

In the signal chain, each sound generator is followed by a gain modifier, which is controlled via a separate ADSR (short for Attack, Decay Sustain, Release) envelope and via an LFO (short for Low Frequency Oscillator).

The resulting signals are then added and sent through a time varying filter which serves as another pillar in PLEX 2's concept: its third component. This is also controlled via a separate ADSR envelope and an LFO.



PLEX 2 – basic signal chain diagram

The partial components

PLEX 2 has more than 90 sound resources that you can use as a starting point to create your own sounds.

Each sound resource consists of separate components called partial components (short: components), which you can combine freely.

It is the strict separation of important characteristics which makes it possible to freely interchange all partial components and thus create fresh and surprising sounds with a natural tonal character.

The components are created so that each only reproduces certain specific characteristics of the analysed sound.

Together, all partial components that belong to one sound resource represent the original sound (provided that no other parameters have been changed).

When you generate a new Preset by assembling partial components, the sound that results depends on the selected sound resources.

The sound of each component can additionally be changed drastically by applying separate ADSR envelopes and LFOs as well as a number of Global parameter settings like Delay, Pitch LFO etc.

Filter component

Filter component icon

The yellow icon symbolizes the Filter component. It represents the gradual sound colour changes over time of the originally analysed instrument/sound. PLEX 2 uses a time varying digital filter for the approximation. A Filter component doesn't "know" about the characteristics of the remaining parts of the signal like cycle length or noise intensity.

The Filter component contributes to the overall sound by modifying the tonal colour of the other basic components.

The Filter component does not use the usual low-pass filter, commonly used in analog synthesizers. Here, the characteristic of the filter is controlled by the position of the yellow partial component icon on the Sound Palette. In other words: The sound resource, to which it is associated, controls the filter's characteristics. For details see page 36.

Base component

Base component icon

The red icon represents the Base partial component. The Base component includes the lower frequencies of the remaining parts of the signal, thus the lower harmonics of the original sound, but no sound colour or volume change information.

Top component

Top component icon

The green icon stands for the Top partial component, which includes the upper spectrum of the signal.

The degree to which the Top and Base components contribute to the overall sound of a Preset is controlled in the LFO and ADSR envelope Top and Base sections.

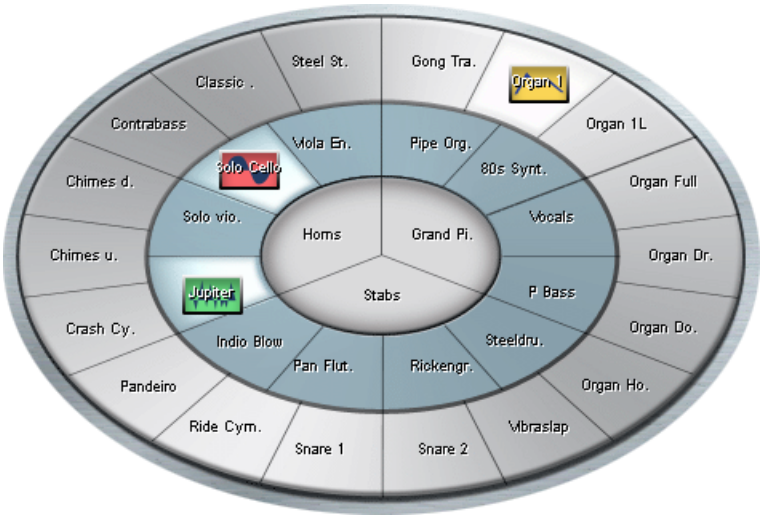
The fourth component

The ADSR envelope and LFO controls in the Top and Base section form complex gain controls that include controlling the component Levels via MIDI Note Velocity.

The Base and Top signal level development (the Gain envelopes) that you set in the Base and Top views of the ADSR envelope section control another important component of the sound. It is possible to apply these Gain envelope settings to other Presets by using the Preset parameter selector fields in the Preset Group section, see page 21.

The Sound Palette

The left part of the PLEX 2 window is called the Sound Palette. Its oval shape is divided into separate fields.



The Sound Palette

To create new preset sounds, you can load up to 33 of all available sound resources into the Sound Palette's fields or use the default Presets.

❒ **When you create new sounds, it is a good idea to select partial components with a different basic sound character. If you use the components of similar sounding sound resources, the variation in sound will not be very distinctive. If you want distinctive sound changes, try mixing Top components that are rich in spectral content with Base components that have a more "dark" character.**

❒ **Combinations of certain partial components can cause distortion. To prevent possible damage to your audio system, it may therefore be a good idea to lower the Master Volume setting, when you try out new combinations.**

If you use the predefined bank that came with PLEX 2, Group D in the Preset Group section will also contain some preset inits of various basic types for you to create your own Presets "from scratch".

❒ **If red question marks or red sound resource names appear in the Sound Palette when you load PLEX 2, then the program doesn't find the respective sound resources. This can e.g. happen if you move or delete the PLEX 2-Data folder or parts of its content. To solve the problem, you must re-install PLEX 2.**

Sound Palette Editing

Loading sound resources

You can freely assign any of the available sound resources to any field in the Sound Palette. When you load a sound resource, it automatically replaces the one previously present in the field. Proceed as follows:

- Right-click (PC) or [Ctrl]-click (Mac) onto a field in the Sound Palette and select the desired sound resource from the local menu that appears.
- If you use a wheel mouse, simply move the cursor onto the desired field and use the wheel to select the sound.

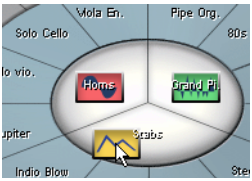
❒ **The current Sound Palette layout is saved with each Preset. It is however useful to keep a certain order to facilitate quick orientation.**

❒ **By selecting the empty General submenu item you can empty individual Sound Palette slots. This speeds up loading/switching time. Another option to create blank Palette slots is available on the Palette Tools drop down menu, see below.**

Combining components for a new preset sound

To create a new preset sound, you must first determine, which three partial components of the available sound resources it should use. This is done as follows:

1. Using the mouse, drag the red partial component icon onto the Sound Resource field whose lower harmonics you wish to use.
2. Now drag the other two component icons (green and yellow) onto Sound Resource fields whose higher spectral content and filter settings you wish to use.

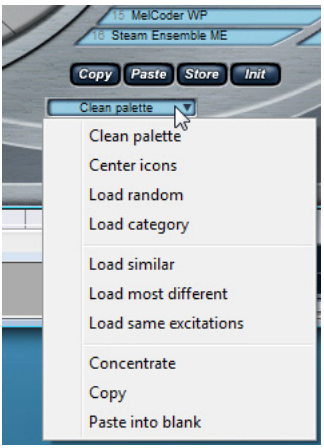


Each new partial component combination will result in a new sound, as described on page 9. The resulting sounds will sometimes be quite surprising. When you have become more familiar with PLEX 2, you will use it intuitively and probably have a good idea of the likely result.

- To restore a basic preset sound to its original settings, re-select it in the Preset Group section, as described on page 21.

❒ **You can use automation to change partial component positions on the Sound Palette. Please note that the corresponding sound change will only be effective on the next Note On message. Thus, a smooth transition between components doesn't happen here.**

Palette Tools drop down menu



This drop down menu at the bottom of the Preset Group section offers a number of functions that help you manage Sound Palette content according to certain criteria.

The respective function is triggered as soon as you select it in the menu.

❒ **Selective functions in this menu always refer to the Base partial component (the component with the red icon).**

The individual functions have the following effect:

Function	Effect
Clean palette	Removes all sound resources from the Palette, except for those used by the current sound.
Center icons	Places the partial components of the current sound in the center of the palette.
Load random	Removes all partial components currently loaded onto the palette and randomly creates one new partial component combination.
Load category	Loads all resources of the current category of the Base component (red icon) into the outer ring of the palette.
Load similar	Loads all resources acoustically similar to the Base component into the outer ring of the palette.
Load most different	Loads resources acoustically most different from the Base component into the outer ring of the palette.
Load same excitation	Excitation means the sound excitation of the acoustic instruments. If, for example, the red icon is located on "Horns", then sounds will be selected, which are also excited by airstream.
Concentrate	Moves the sounds of the outer ring to the middle ring.
Copy	Copies all resources into a clipboard.
Paste into blank	Pastes the resources on the clipboard onto ALL empty fields

In this manner, you can quickly fill the palette with your favourite sounds.

❒ **The more empty fields there are on the palette, the faster the loading process will be on Preset change.**

Before we get to more detailed editing – as described starting on page 25 – let's quickly check out how you store what you have created and how you load it again.

The Preset Group Section

The Preset Group section of the PLEX 2 window

Same as all other PLEX 2 editing sections, the Preset Group section is located to the right of the Sound Palette.

This is where you temporarily store and load single preset sounds.

When you first load PLEX 2, a default Bank is automatically loaded from disk.

It contains 8 Programs (“Instruments”).

Each Program can hold 4 PLEX 2 Preset groups of 16 Presets each.

Several groups in the default bank will contain predefined Preset, others will be free for you to create and store your own sounds.

The PLEX 2 sound resources and Preset groups have been designed by well-known German sound designer Hubertus Maaß, by CS and by Wolfgang Palm.

Each Preset contains a complete set of parameters for one sound.

- To open the Preset Group section, click on the Preset button in the top right of the PLEX 2 window.

  PLEX 2 has four groups called A, B, C and D. Each group has 16 Preset slots, all four groups together do therefore contain 64 sounds.

  From top to bottom, the Preset Group section consists of the items described below.

Group Name

You can separately name each of the four PLEX 2 groups.

- Select the desired group button (A, B, C or D). Then click on the group name field at the top of the section to select it.

- Type in a new name and confirm by pressing [Return]

Group selector buttons

Four group selector buttons are available below the group name field.

- To select a PLEX 2 RAM group of 16 preset sounds, just click on any of the group selector buttons.

The group selector buttons

Preset Slots and Preset Parameter Selectors

Selecting a Preset

- Open the PLEX 2 window and click on one of the Group icons A to D. Then select a single Preset from the currently visible Group by clicking on it with the mouse.

❒ **To avoid confusion, PLEX 2 Presets are not selected using the Program pop-up menu in the VST Instruments rack. Please use the Preset Groups in the PLEX 2 window. If you use "Load Instrument" or "Load Bank" in the rack's File menu to load a single Program ("Instrument" file = 64 Presets) or a Bank file (= 8 programs or 512 Presets) from disk, then this will overwrite the previous Program in RAM. In other words: all four current Groups will be overwritten!**

- You can also use Program change messages to select a Preset. To do this in Cubase, you can for example use the Prg field in the Inspector, enter a Program change in the List Editor or record a Program change message.

❒ **A program change might take some time, depending on the size of the sound resources that must be loaded.You should therefore avoid to insert a program change between two close notes.**

- You can use the vertical arrows on your computer keyboard to select a Preset in a Preset Group.

Resetting a Preset to its Default Settings

You can reset a Preset to its default values, i.e. the settings as they were when you loaded the Group (Program or Bank) into RAM.

- To do this, click on the Preset while holding down the [Ctrl] key.

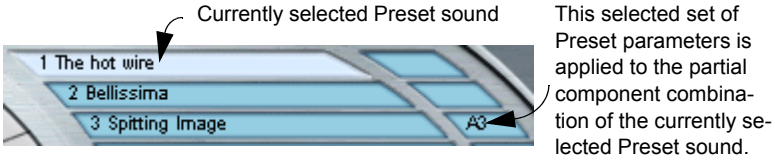
Applying the Preset Parameters of another Preset to the currently selected one

To the right of each Preset slot in the Group, there is a small field called Preset parameter selector.

Its function is simple, yet powerful. You can use it to quickly exchange all parameter settings of the currently selected Preset sound with those of the sound on whose Preset parameter selector field you click.

- This lets you very quickly assign the fourth component (the Base and Top signal level development) as well as all Global PLEX 2 settings to another Preset sound.

  You can even use the parameter settings of any Preset sound in the PLEX 2 Groups A, B, C or D.



❒ **The partial components of the originally selected Preset sound remain selected when you change the parameter settings by using the Preset parameter selectors!**

Proceed as follows:

1. Select a Preset sound in any of the current PLEX 2 Groups.
2. If necessary, change the currently visible Group by clicking on any of the Group Selector buttons.
3. Click onto the Preset parameter selector field of the sound whose parameter set you wish to use in connection with the partial components that have been set by the Preset sound that you selected in step 1.

Copy, Paste, Store and Init Buttons

Using these buttons, you can copy Presets from one Preset slot to another within the PLEX 2 window. (It is of course possible to rename them.) You can furthermore temporarily store individual Preset sounds in RAM and recall the last Preset sound version that was stored in RAM.

The Copy, Paste, Store and Init buttons

Copy & Paste

Proceed as follows:

1. Select the desired Preset by clicking on it.
2. Use the Copy button to copy the Preset into an invisible clipboard memory.

3. Use the Group selector switches (A to D) to find an “empty” Preset slot or one you wish to overwrite. Select it, then click on the Paste button.
   The copied Preset is pasted from the clipboard into the selected Preset slot.

Store

1. Change the Preset settings as desired.
   Read the following pages of this manual to find out what you can do with the various controls or use the Preset parameter selectors, described above.
2. When you have finished editing, press [Alt] and click the name of the Preset. Then enter a new name via your computer keyboard.

3. Click the Store button. This will store the current parameter settings in RAM as part of the currently selected Preset sound.

❒ **Clicking Store does not store anything onto disk! The edited sound is only temporarily stored in RAM and is lost when you close PLEX 2! You must use the “Save Instrument” or “Save Bank” commands in PLEX 2’s File pop-up menu to actually store the sound onto disk! How this is done is described below.**

Init

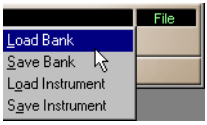
When you have edited a sound and wish to undo your editing and revert to the original version as saved in the Instrument or Bank file, then click this button.

❒ **This function only affects the currently selected Preset. It does not store anything to disk.**

VST Instrument and Bank Files

As mentioned earlier, one PLEX 2 Group holds up to 16 Preset sounds. All four Groups thus contain up to 64 sounds.

One such entity of 64 sounds can be saved to and loaded from disk as a “Program” (in Cubase or Nuendo this is called “Instrument”).



You can also load or save Preset Banks (.fxb-files) via the File pop-up menu in the VST Instruments rack. Each Bank contains up to eight “Programs” (“Instruments”), thus 512 Preset sounds.

In Cubase and Nuendo, the corresponding functions are called “Load/Save Instrument” and “Load/Save Bank”.

When you save your Cubase or Nuendo Song file, the following information is saved with it:

- The number of PLEX 2 modules used in the Song
- Which Groups and Presets were used
- Changed Preset settings

❒ **However, if you wish to use the edited version of a Preset in another Song, then you must save it using one of the Save functions in the File pop-up menu on the VST Instrument rack.**

Loading a Program or a Bank

Proceed as follows to load a Program or Bank:

1. In the VST Instruments rack or the PLEX 2 window, click on the “File” pop-up menu and select “Load Instrument” or “Load Bank”.
   A dialog will open where you can select the desired Program or Bank.
2. Do this, then confirm by clicking “Open” or pressing [Return].
   The Program or Bank will be opened.

Saving a Program or a Bank

Proceed as follows to save a Program or Bank:

- In the VST Instruments rack or the PLEX 2 window, click on the “File” pop-up menu and select “Save Instrument” or “Save Bank”.
  A dialog will open where you can save the Program or Bank under the same or a new name.

Creating a Default Bank

You can quite simply create your own default Bank that is automatically loaded each time you start PLEX 2:

- Rename a PLEX 2 .fxb file to plex2def.fxb and save it in the PLEX 2-Data folder (which is located in the Vstplugins folder).

The LFO Section

If you click on the LFO button in the top right of the PLEX 2 window, you can access the LFO sections for the Base, Top and Filter components to the right of the Sound Palette.

The LFO section

LFO is an abbreviation for Low Frequency Oscillator. In synthesizers, this type of oscillator generates a regularly repeated waveform at a fairly low frequency, which can be controlled. The waveform type can be selected and is e.g. used to modulate the signal pitch and/or filter modulation.

In this section, you can make individual Low Frequency Oscillator settings for the Base, Top and Filter components.

Here's a short description of each control and what you can do with it:

LFO Bypass Button

If you click on this button at the top of the LFO section so that it is highlighted, then you bypass the LFO completely for all three components.

Preset Sound Name

This field next to the LFO Bypass button shows the name of the currently selected Preset sound.

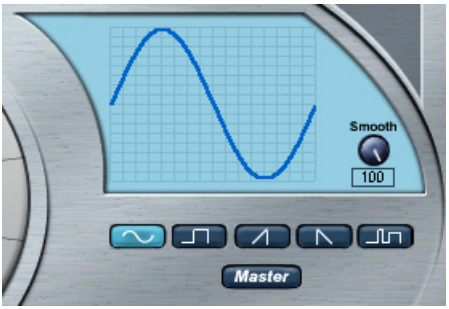
Base, Top and Filter Buttons

Three individual views and parameter sets – one for each partial component icon– are available in the LFO section of the PLEX 2 window.

- To get access to these views, you must first click on the LFO button and then on one of the three component buttons (Base, Top or Filter).

Wave Type Selectors and Wave Display

The center of each view in the LFO section is occupied by a display that shows the current LFO waveform.

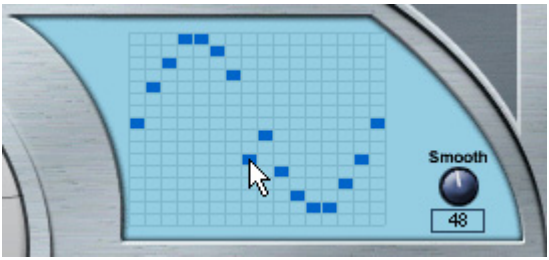


Wave display, Wave type selectors, Smooth dial and Master button

These basic waveform types are available:

- Sine wave
- Square wave
- Sawtooth
- Reverse Sawtooth
- Random wave. Each time that you click on this button, a new waveform is generated.

All waveforms consist of 16 steps which can individually be set with the mouse.



- To get the hang of it, select a sine wave by clicking on the sine wave button. Then click somewhere into the wave display.
  The display will now show all sixteen steps and you can use the mouse to position each of them individually.

❒ **You can use standard Copy and Paste functions (PC: [Ctrl]-[C] and [Ctrl]-[V], Mac: [Command]-[C] and [Command]-[V]) to copy edited LFO waveforms to another view or even to another Preset sound.**

Smooth Dial

You can use this dial to smooth the “curve” that you create by positioning the 16 steps described above.

Master Button

When you activate this button, the LFO settings of the corresponding LFO view (Base, Top or Filter partial component setting) serves as the Master for the other two LFOs. That is, all three LFOs will run in sync with the same frequency.

Speed

This dial lets you control the LFO frequency. It has a logarithmic resolution. That is, lower values can be set in finer “steps” than higher values. Values between 0 and 100 are available.

- If Sync (see below) is On, the Speed dial uses musical notes values for setting the LFO speed, which lets you perfectly sync the LFO to the music. With Sync active, you can also select the musical note values on a pop-up menu that appears when you click onto the value display below the Speed dial.

Sync

This On/Off button lets you change the Speed parameter to display musical values ranging from a 32nd note triplet to a whole note.

Delay

Using this dial, you can set the length of a pause between the moment when the sound sets in and the moment when the LFO starts to have an effect on the sound.
Values between 0 ms and 11 s are available.

Amount

This dial lets you controls the LFO amplitude level.
Values between 0 and 100 are available.

The ADSR Envelope Section

If you click on the ADSR button in the top right of the PLEX 2 window, the ADSR views for the Base, Top and Filter partial components become available to the right of the Sound Palette.

The ADSR envelope section (Filter view is visible)

- Click on the Base, Top or Filter button to select the corresponding view of the ADSR envelope section.

Here, the Top view is selected.

In the Base and Top views of this section, you apply the ADSR envelope to the Gains of PLEX 2's Sound Generators. In other words: you control the level of the sound they generate. Base and Top cover different sound spectra. Therefore, different ADSR envelope settings for both will cause changes in sound.

In the Filter view, you make the settings for the Filter Resource. In other words: This is where you control the chronological development of tonal colour that was originally analysed and stored in a sound resource as the Filter component. You control it by creating a shape and setting the degree to which – as well as the point in time at which – it is applied.

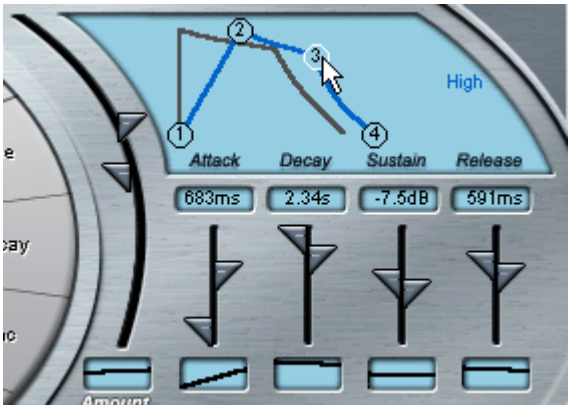
In contrast to the usual low-pass filters, often used in analog synthesizers, the characteristic of PLEX 2's Filter component therefore depends on the sound resource that it belongs to.

The filter will sound quite different when you move the yellow Filter icon to another Sound Resource field on the Sound Palette.

The Filter of a Cembalo, for example, has a considerably brighter character than that of a Piano.

PLEX 2 has an Emphasis dial that you can use to emphasize or attenuate resonances in the the Sound Resource. Find more info on page 35.

Key Balance



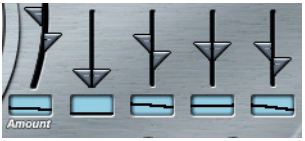
This section contains an unusual feature: To create a Key Balance across a musical keyboard, each of the five faders Amount, Attack, Decay, Sustain and Release gives you the opportunity to make two different ADSR envelope settings for each component.

These settings are reflected by the graphs in the small rectangle displays below each fader pair and by the "High" and "Low" ADSR envelope shapes.

- To directly change an ADSR point or line in the display, simply drag it to another position with the mouse.
- To set both handles of a fader in one go, either press [Alt] and drag a handle or drag the line inside the small rectangle display.

You can switch between the "High" and "Low" ADSR envelopes:

- On a Windows-PC, right-click in the “High” and “Low” ADSR envelope display or click in the envelope display and press the keys [1] or [2] in the main part of your computer keyboard.
  Your host application must support this feature (Cubase and Nuendo do so).
- On an Apple Computer, click in the envelope display press the keys [1] or [2] in the main part of your computer keyboard.
  Your host application must support this feature (Cubase and Nuendo do so).



The left part of each fader has the strongest effect on MIDI Notes starting from Note number 24 upwards, while the right part of each fader affects MIDI Notes starting from Note number 85 downwards. The two note numbers stand for the lowest and highest keys on a 5 octave keyboard (C to C).

Example: If you set the left half of the Decay fader handle to its highest value and the right half of the Decay fader handle to its lowest value, then the lower notes will have a long decay while the higher notes will have a short decay.

Elements in the ADSR Envelope Section

Here’s a short description of all elements in the three ADSR views and what they are used for:

Preset Sound Name

This field next to the ADSR logo shows the name of the currently selected Preset sound.

Here you can also load another Preset sound:

1. Click on the Preset Sound Name field to open a pop-up menu that contains four sub-menus with the four Preset Groups.
2. Move the mouse pointer onto the desired Group and select the Preset sound in the sub-menu that pops up.

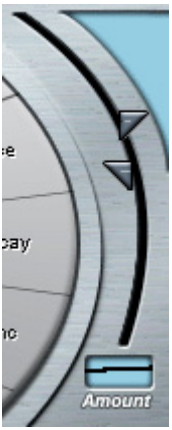
Selecting a new Preset sound in the ADSR envelope section

Base, Top and Filter Buttons

Three individual views and parameter sets – one for each partial component – are available in the ADSR section of the PLEX 2 window.

- To get access to these views, you must first click on the ADSR button and then on one of the three component buttons (Base, Top or Filter).

Amount Fader



In the Base and Top views, you can use this fader to set the envelope gain – i.e. the level – of each Sound Generator. In the Filter view, this fader controls the Filter amount, i.e. the degree to which the filter is applied to the signal generated by the Sound Generators. The two separate fader handles are used to create a Key Balance across a musical keyboard. Find more details on page 30.

The Filter component of each sound resource reflects the original instrument's complete tonal colour development over time – from the first attack to the end of the sound or its sustain.

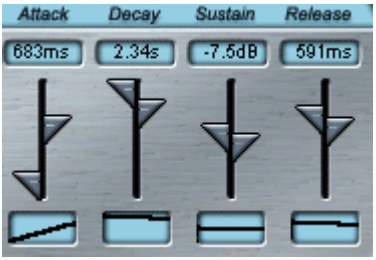
Fully turning up the envelope's Amount Fader will therefore reproduce the complete tonal development of the sound.

- If Attack is set to 0, then the envelope starts with its maximum value, which corresponds to the start of the original tonal development.
- If Sustain is set to 0, then the filter will naturally sound out, which corresponds to the original sound's end.

  Many instrument sounds do not drastically change their tonal colour. The Filter effect set for these may be less obvious than e.g. the moog setting.

❒ **The fader resolution of all faders in the ADSR section is higher when you hold down [Shift] while setting a fader.**

Attack, Decay, Sustain, Release – Display and Faders



The Attack, Decay, Sustain and Release faders

The center of each view in the ADSR section is occupied by a display that shows the current settings of the respective ADSR envelope and its faders.

Control	Value range	Effect
Attack	0 ms – 10,76 s	Controls the speed with which the envelope reaches its maximum level value.
Decay	0 ms –10,76 s	Controls the time needed for the envelope to reach the Sustain level value.
Sustain	-∞ – 0.0 dB	Lets you set the Sustain level value. This is held until you let go of the key on your keyboard.
Release	0 ms – 10,76 s	Controls the speed with which the envelope drops from Sustain value to a level of —∞.

❒ **Please note that you can both directly grab and change the ADSR point positions in the display as well as create bent curves by dragging the individual envelope lines with the mouse. On a PC, use the right mouse button to select the other of the two possible envelope variations. On a Mac, click into the display, then press [1] or [2] on the main computer keyboard.**

Velocity

This dial controls the effect of MIDI Note Velocity on the level of the respective partial component.

Vel Attack

Using this dial, you can control the effect of MIDI Note Velocity on the Attack value of the ADSR envelope.

Octave (Base and Top component only)

This dial is used to define the basic pitch setting for the Base and/or the Top component. In other words: This is where you give the Base and/or Top partial component a certain basic pitch. Available values range from -2 to +2 octaves.

Start Offset (Base and Top component only)

You can use this dial to define the starting point within the waveform. The available values range from 0 to 100.

- If you set this dial to 0, the wave will start at its beginning.
- If you set this dial to a higher value, wave reproduction starts later in the wave.

Velocity Start (Base and Top component only)

If you play PLEX 2 from a MIDI keyboard capable to generate Note Velocity values, then these are also sent to PLEX 2.

The Vel(ocity) Start dial lets you control the degree to which Note Velocity has the effect to move the starting point backwards within the waveform. The available values range from 0 to 100.

❒ **The effect of this parameter is always added to the effect generated with the Start Offset dial.**

- If you set this dial to 0, Note Velocity has no effect on the start position within the waveform.
- The higher you set this dial, the later within the waveform reproduction will start.

Emphasis (Filter component only)

Filter resonance occurs when frequencies near the filter's cutoff frequency are emphasized while the other frequencies are attenuated.

The Emphasis dial is used to control this parameter.

- If you set this dial to a center position, filtering will match the settings in the sound resource.
- Setting the dial to somewhere between the center and extreme left positions will attenuate resonance.
- Setting it to a position somewhere between center and extreme right will increase emphasis and thus create stronger peaks.

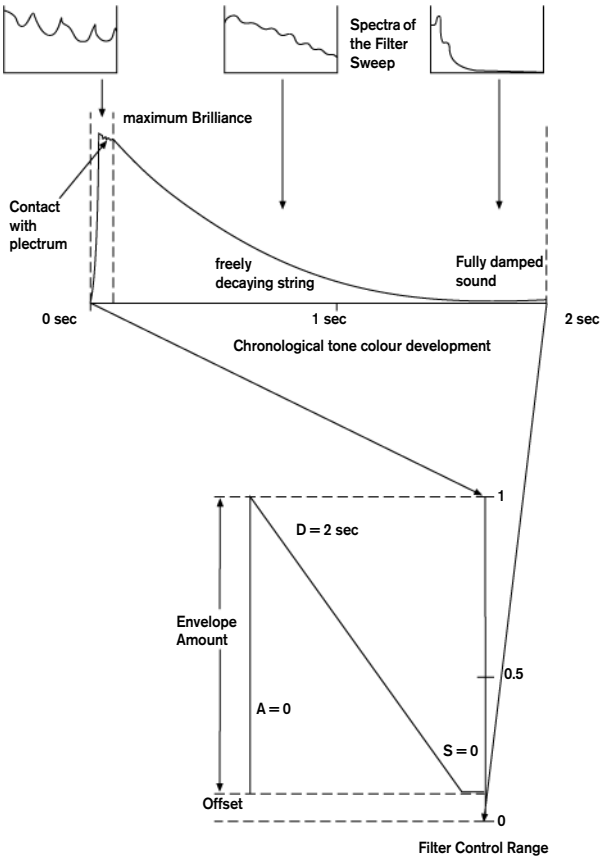
This parameter has strong similarities with a Moog™ filter, but the PLEX 2 variant creates individual results, that depend on which sound resource is used. If the filter creates several resonances, these can all be emphasized or attenuated with the Emphasis dial.

Offset Lo/Hi (Filter component only)

These two Offset parameters can be used to set the starting-point of the envelope, separately for low and high notes. This will help you to minimize the proportion of the envelope and use the Key Balance – see page 30 – to define the envelope range.

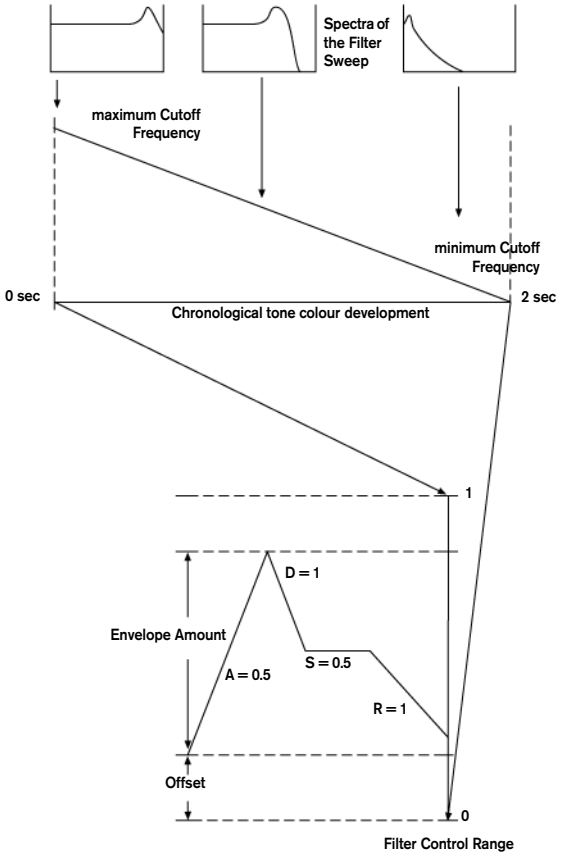
Examples

Acoustic Guitar



If you set the PLEX 2 ADSR envelope to the values shown above, then the synthesizer passes through almost the complete tonal development of the guitar. If you set Offset to 0 and Amount to 1, then the synth reproduces the complete tonal development.

Moog with a decaying Filter Sweep



This example shows that PLEX 2 can reproduce the typical tonal development of a Moog synthesizer 1:1. Depending on the Offset setting, the sound will initially be more or less muffled, become brighter while passing through the Attack phase and becomes muffled again during the Decay phase. You can find an example of this in Group D. The Preset is called “moog with key balance”.

Global Settings

PLEX 2 lets you make a number of global settings that you can use to further edit and change the sound.

- To open the Global section, click on the Global button in the top right corner of the PLEX 2 window.

The Global section

These are the individual functions available here:

Preset Name

At the top of this section, next to the term “Global”, you find the Preset field. If you wish to select another Preset from here, do this:

- Click in the Preset field to open a pop-up menu where you can select a Group and a Preset from that Group.

Pitch LFO

This additional Low Frequency Oscillator controls the pitch of both the Base and Top Sound Generators.

The Pitch LFO

These are the parameters:

Control	Value range	Effect
Speed	0 – 100	Controls the LFO frequency. When Sync is On, you can control the LFO frequency by selecting musical notes values. Click on the small Speed value display to bring up a pop-up where you can select a note value.
Sync	On/Off	Changes the Speed parameter to musical values ranging from a 32nd note triplet to a whole note.
Delay	0 ms – 11 s	Lets you set the length of a pause between the moment when the sound sets in and the moment when the LFO starts to have an effect on the sound.
Amount	0 – 100	Controls the LFO amplitude level.
Waveform	Various	Lets you select a Pitch LFO waveform.

You can use the Modulation wheel on your MIDI keyboard to control the intensity of the Pitch LFO, see page 40.

Pan

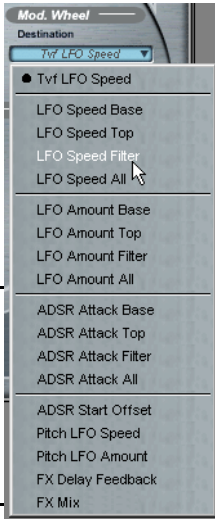
The Pan section

The Pan section consists of two parameters:

Control	Value range	Effect
Pan	0 – 100	Defines the stereo position of the signal.
Spread	0 – 100	Adds a random value to the pan position of the current sound.

Mod. Wheel

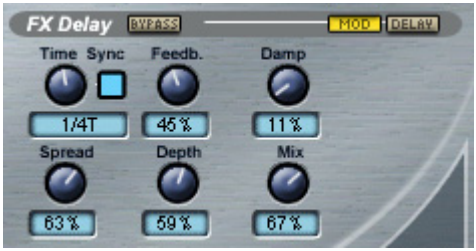
This pop-up menu lets you freely assign any PLEX 2 parameter or one of the parameters pre-selected in the pop-up to the Modulation wheel of your MIDI keyboard (MIDI Controller number 1).



- Click on the “Destination” pop-up and select the desired parameter.
  The freely assignable parameter is always listed at the top of the pop-up and displayed in the Destination field in italic characters.

❒ **The freely assignable parameter remains the same for all Presets and/or PLEX 2 units that are open at the same time, because it belongs to the controllers.ini file (see page page 44). All other parameters in the pop-up are saved with each Preset and will therefore change when you select another Preset.**

FX Delay



This is an effect unit with a variety of functions:

Function	Parameter range	Effect
Bypass button	On/Off	In On position, the signal bypasses this section.
Mod/Delay	Toggles setting	This toggles between two available effect types: “Mod” is a Flanger/Phaser type effect while Delay is used to generate echoes.
Time	Delay: 20 ms – 2 s Mod: 0.002 Hz – 5 Hz	Lets you set the time between individual echoes or the modulation speed. When Sync is On, the time values are changed to musical notes values. Click on the small Time value display to bring up a pop-up where you can select a note value.
Sync	On/Off	Changes the Speed parameter to musical note values. Lets you thus synchronize the effect to the music.
Feedback	0 – 100%	Lets you set the amount of echoes or the intensity of the modulation.
Damp	0 – 100%	Is used to set a percentage of the high frequencies in the effect signal that should be filtered out.
Spread	0 – 100%	Defines how much of the available stereo width is used by the current effect.
Depth (Mod mode only)	0 – 100%	Sets the frequency range of the Flanger effect.
Mix	Dry – Wet	Dry = original signal only. Wet = effect signal only.

Voices

Using this dial, you can set the number of simultaneously available voices per PLEX 2 module. Available values range between 1 and 64 voices.

The Voices and Master Tune dials

Master Tune

Using this dial, you can change the Master Tune setting by up to a semitone lower (–100ct) or higher (100ct).

Volume Dial

This dial is always visible. It lets you control the volume that PLEX 2 outputs to its host application.

❒ **This parameter is saved individually for each Preset Sound!**

The on-screen Keyboard

If necessary, PLEX 2 can provide you with a standard keyboard (61 keys) on your screen.

- To open the on-screen keyboard, simply click on its button in the lower left corner of your PLEX 2 window.

If you click here…

…this on-screen keyboard appears. You can play it by clicking keys with the mouse.

If you use a real keyboard that is connected to your host application via MIDI, then you can hide the keyboard by clicking on its button once more.

Click here to make the on-screen disappear again.

Remote-Controlling the PLEX 2 Parameters

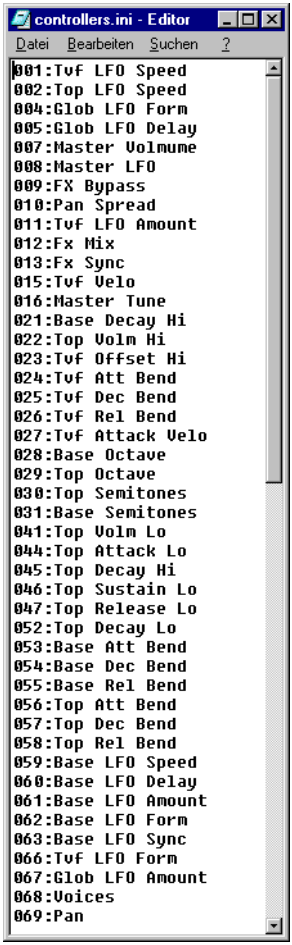
You can assign all PLEX 2 parameters to MIDI Controller numbers. You can use this feature to remote-control PLEX 2 from an external hardware controller or synth that sends MIDI Control messages. You can also record and play back the MIDI controller data in your host application and thus automate parameter changes in PLEX 2.

There is a default list, that defines which MIDI Controller number is assigned to which PLEX 2 parameter. When you first start PLEX 2, it will automatically generate this file and store it as “controllers.ini” in the PLEX 2-data folder that is located in the Vstplugins folder.

You can edit the “controllers.ini” list in any text editor and change the assignment of a Controller to a certain PLEX 2 parameter.

- All you must do is change the controller number listed before the parameter and save the list under the same name.

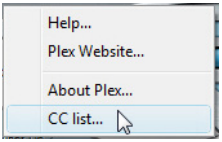
  If you delete the “controllers.ini” file, PLEX 2 will automatically create a new default version when you start the Plug-In next time.



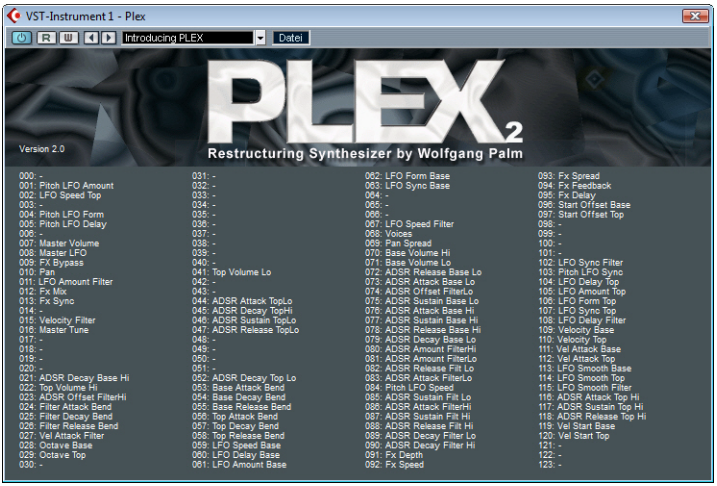
This document defines which MIDI controller number and PLEX 2 controls are assigned to each other.

For quick reference, all “controllers.ini” settings are also available in the PLEX 2 CC list:

- On a Windows-PC, right-click on an empty area outside the Sound Palette. window section. On an Apple Computer, use [Ctrl]-click. Then select “CC list...” in the pop-up menu that appears.



This will open the following PLEX 2 view:



- To close this later, simply click on it.

Pop-up Menus

PLEX 2 provides a number of pop-up menus in certain sections of its user interface. On a Windows-PC, these can be brought up by right-clicking on the corresponding window section. On an Apple Computer, you bring up a pop-up by [Ctrl]-clicking on the corresponding window section. These pop-ups are available:

Pop-up Menu	Commands / Options / Functions	
General	Help…	Brings up the Adobe Acrobat Reader (if that is installed on your computer) and automatically loads the Help information.
	PLEX 2 Website…	Connects you directly to the PLEX 2 page on the web, provided that you have a working and active connection to the internet.
	About PLEX 2...	Brings up a screen that lists people who have contributed to the development of PLEX 2.
	CC list...	Brings up a screen with all MIDI Controller numbers and their current assignment to PLEX 2 parameters.
Sound Palette	Various sound resource group sub-menus that contain individual sound resources	
Musical values	These pop-ups are available when the Sync buttons of an LFO or of the FX Time is active. They let you select musical values for synchronisation.	
Mod. Wheel	This lets you assign one of the parameters listed in the pop-up to the Modulation wheel of your MIDI keyboard. This choice can be saved with each individual Preset. As an alternative, you can assign the Modulation wheel (MIDI Controller 1) to any PLEX 2 parameter in the controllers.ini file. This setting will then be used globally for all Presets and PLEX 2 units that you currently use.	

Key Commands

LFO Section

Windows-PC	Apple Computer	Function
[Ctrl]-[C]	[Command]-[C]	Copy LFO Curve
[Ctrl]-[V]	[Command]-[V]	Paste LFO Curve

Preset Group Section

Windows-PC	Apple Computer	Function
[Alt]+Click	[Alt]+Click	Edit Preset Name
[Ctrl]+Click	[Command]+Click	Reset Preset to original settings (as originally loaded)

ADSR Envelope Section

Windows-PC	Apple Computer	Function
Click in the envelope display, then press [1]or [2] on main keyboard or right-click in the envelope display	Click in the envelope display, then press [1] or [2]	Toggle between the two envelopes in the ADSR envelope display

Sound Palette

Windows-PC	Apple Computer	Function
Right-click	[Ctrl]+Click	Open Sound Resource pop-up menu

All Dials

Windows-PC	Apple Computer	Function
[Ctrl]+Click	[Command]+Click	Reset to dial default value

Selected Dials or Faders

You can use the arrow keys to change the setting of the last selected dial or fader. Simultaneously pressing [Shift] increases the resolution of the selected control.

Tips and Tricks

How can I quickly create certain specific sounds?

If you have a certain idea of how a Preset should sound, try this:

1. In the Preset Group section, click on the Group D icon to open this Preset Group.
2. Select one of the “Plex Init” Presets.
3. Say, you want to create a sound that is percussive, similar to a piano, but somehow more brilliant in the Attack, you can select the Preset “PLEX Piano Init”.
   You will see that all component icons are now positioned on the Piano sound resource.

   You can of course select components from several other percussive sounds in the Sound Palette.
4. Simply try out other sounds by moving the green icon onto another sound resource in the Palette.
   This exchanges the upper part of the sound’s spectrum.
5. You can move the yellow component icon to exchange the sound’s complete sound colour development over time.
6. If you have found something good, switch to the ADSR envelope section and change the Gains of the Base and Top components (Amount), the MIDI Note Velocity and the envelope settings.
7. You can change the Filter amount in the Filter view of the ADSR envelope section and use the Offset-Parameters to set the starting-point of the envelope.

How can I create unusual and surprising sounds?

PLEX 2 is the ideal tool for this kind of task! Try this:

1. Simply select a Preset, e.g. “Plex Strings Init” in Group D.
2. Change the Top component for an atonal sound. Try dragging the green icon onto the Sound Resource field “Chimes Down” in the “Percussion” category.
3. Now change the Base and Top envelopes to make them set in with a delay.

How can I create an empty field on the Sound Palette?

- Right-click (Windows-PC) or [Ctrl]-click (Apple Computer) on the field to bring up the Sound Resource pop-up menu. In the last category, select the empty field.

  Using an empty field can be useful if you want to experiment and not change another Preset or e.g. if you want to check out a Top or Base component's sound without a filter.

Finding out about PLEX 2's Filter characteristics

You can directly compare the Filter Resources by using the "Noise Generator" Preset, located in Group D:

1. Select it and only move the yellow icon onto other fields.
   This lets you test the effect of the Filter, as the Base and Top components only create White Noise.
2. Now, try out various envelope settings in the Filter view of the ADSR envelope section.

Do I have additional possibilities to dynamically change the tone colour?

Yes! Try setting the Key Balance between the Base and Top components.

As the Base component only contains the lower part of the frequency spectrum and the Top component contains the higher part, you can use the envelopes to create a nice tonal dynamic.

- Try setting the Attack time of the Base Generator to ca. 2 sec and set the Top envelope so that it generates a percussive sound.

  Or

- Modulate the Gains with the LFOs.
- Also, try out using the MIDI Note Velocity.

Glossary

Term	Explanation
ADSR	Abbreviation for the envelope parameters Attack, Decay, Sustain and Release. In this Glossary, all four terms are described under their individual names. Also see: Envelope.
Attack	Envelope parameter. Actually, it is a time value that you set. By doing so, you control the speed with which the envelope reaches its maximum level.
Bank	Group of up to 512 Preset sounds (grouped as eight “Programs” or “Instruments”) that you can load or store. In host applications like Cubase or Nuendo, this is either done via the File menu of the PLEX 2 window or via its “brother” on the VST Instruments rack.
Decay	Envelope parameter. Same as Attack, Decay is a time value that you set. By doing so, you define how much time it takes for the envelope to reach the Sustain level value.
Delay	a) Type of effect that creates echoes of the signal it receives. b) In LFOs: Adjustable time gap between the moment, when the trigger signal arrives in the LFO and the actual start of the modulation added by the LFO.
Envelope	An envelope is a signal created by an Envelope Generator. It is a control signal that modulates a basic sound shaping element within a given period of time. An envelope can for instance modulate the pitch of a basic sound or the filter corner frequency of a filter. The filter is then controlled by the envelope shape and can thus continuously change the characteristics of the filtered sound. Various types of envelope are used in different synthesizers. The classic envelope form consists of four separately adjustable phases: Attack, Decay, Sustain and Release. For this reason, it is called ADSR envelope. When a trigger signal arrives, the envelope starts its travel through the Attack and Decay phases until it reaches the Sustain level. This is held for as long as the trigger signal lasts. Thereafter the envelope starts its Release phase, which lowers the level to the minimum value.

Term	Explanation
Filter	Filters are very important sound shaping elements in a synthesizer. In contrast to the usual low-pass filters, often used in analog synthesizers, the characteristic of PLEX 2's Filter component depends on which sound resource it uses. In many cases, the filter will reproduce the chronological sound development of the original instrument and it can therefore sound quite different when it uses another sound resource.
Group	Group of up to 16 Preset sounds. PLEX 2 has four internal Groups (A, B, C and D) in RAM.
Instrument	Also called Program. In this context: Entity used in the VST host applications Cubase and Nuendo. One "Instrument" or "Program" includes the sounds of all four internal PLEX 2 Preset Groups, thus 64 sounds. It can be stored or opened from disk via the File pop-up menus in the PLEX 2 window or in the VST Instrument rack. Also see Group, Program and Bank.
LFO	Abbreviation for Low Frequency Oscillator. In synthesizers, this type of oscillator generates a regularly repeated waveform at a fairly low frequency, which can be controlled. This frequency is then used to modulate a signal pitch and/or a filter modulation etc. Usually, you can select one of several basic waveform types for the LFO oscillation. PLEX 2 goes one step further. Actually, it goes 16 steps further, as you can split each basic LFO waveform into 16 separately adjustable steps which can be positioned as desired. It is thus possible to generate any imaginable waveform. If desired or necessary, a Smooth dial can be used to smooth jumps between steps.
MIDI	Abbreviation for "Musical Instrument Digital Interface". Standard for connecting electronic instruments of different type and brand, computers etc with each other.
Modulation	Process during which a signal from a source called modulation source influences a sound. Examples for modulation sources are LFOs, envelopes or MIDI messages.
Pan	Dial used to position a mono audio signal within a stereo left/right spectrum.
Pitch LFO	In PLEX 2: Type of Low Frequency Oscillator that controls the pitch of the Base and Top Sound Generators

Term	Explanation
Program	Also called Instrument. In this context: Entity used in the VST host applications Cubase and Nuendo. One “Program” or “Instrument” includes the sounds of all four internal PLEX 2 Preset Groups, thus 64 sounds. It can be stored or opened from disk via the File pop-up menus in the PLEX 2 window or in the VST Instrument rack. Also see Group, Instrument and Bank
Release	Envelope parameter. Controls the speed with which the envelope drops from Sustain value to a level of $-\infty$.
Steps	The basic LFO waveforms in PLEX 2 can be split up into 16 separately adjustable steps which can be positioned as desired. This makes it possible to generate a great variety of waveforms. If desired or necessary, a Smooth dial can be used to smooth strong jumps between steps.
Sound Generator	Basic sound source in a synthesizer. Also called oscillator.
Sound Palette	Oval section in the PLEX 2 window where you can combine partial components to create new Presets.
Sound Resource	A basic sound that has been processed so that parts of it can easily be combined with parts of other basic sounds. Each sound resource is split into three different components - called partial components or short components. These can be combined and merged freely to create completely new Preset sounds. The three partial component types available in PLEX 2 are called “Base” (red), “Top” (green) and “Filter” (yellow).
Sustain	Envelope parameter. Controls the Sustain level value of the envelope. This level is held until you let go of the key on your keyboard.
Velocity	Here: Speed and therefore pressure with which you play the keys of a musical keyboard.