PANda

Version a1, build #6, 2024-07-25

P.moon PANda is a panner with various functions. Some are common, others aren't. Though rather many controls are needed, module front contains only a few knobs with switchable labels and operations.

PANda is used to distribute a mono signal to two stereo channels. If no signal cable is connected to input, module outputs will provide CV, which can be used to control other devices.

In order to prevent from unwanted noises, panorama value change is smoothed.

Functions:

- **MAN**ual operation
- modulation by internal **LFO**
- **MOD**ulation by external CV
- **TRIG**gered switching between 1 to 8 panorama values
- **KEYB**oard like pitch controlled operation
- pipe **ORGAN** like pitch controlled operation
- **W**ide stereo enlargement is possible

Common controls and connectors

Several controls are used for several functions. They will explained later. First common controls get introduced.

Any signal may be fed to this input. There isn't any limitation for neither frequency nor voltage.

If no cable is connected to signal input, PANda will process with 5 volt DC.

Below signal input there is a gray area with a CV input. Expected kinds of CV as well as label depend on selected mode.

Front areas with dark gray background contain a knob. It's usage as well as it's labels depend on selected mode.

If not needed for operation, knob area stays empty.

Gray handle lets you select an operation mode. Selected mode is shown in black display.

At the bottom is the output area with two channel output jacks **L** and **R**.

Above jacks a light green dot visualizes actual panorama position on a horizontal bar meter. Dark green background marks regular stereo signal range. "Regular" means an output signal level between zero and 100 percent of input signal level. In center position each jack outputs 50% of input signal.

When small **W** ("wide") button is toggled on, stereo enlargement gets enabled. That allows signal level of one channel to reach 150%, while the other channel provides -50%. That means 50% with inverted polarity.

Operational modes and their controls

In **MAN**ual mode panorama position has to be set by turning the **pan** knob.

Range: -2.0 to +2.0 (regular stereo range is -1.0 to +1.0)

Default: 0.0

In **LFO** mode internal low frequency oscillator is used to modulate panorama position.

A trigger pulse at CV input lets LFO start a new cycle. This may be helpful, if several **PANda** modules have to be synchronized.

Blue **rate** knob sets LFO frequency.

Range: 0.01 to 10.0 Hz

Default: 0.5 Hz

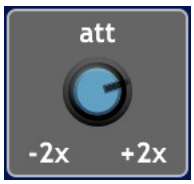
Width knob lets you set modulation depth.

Range: -2.0 to +2.0 (regular stereo range is -1.0 to +1.0)

Default: +1.0

In this mode an external CV **MOD**ulates panorama position.

CV source must be connected to **pan** input jack.



Modulation intensity can be adjusted with **att**enuverter knob.

Range: -2.0 to +2.0

Default: +1.0

Orange knob lets you preset a panorama position.

Range: -2.0 to +2.0 (regular stereo range is -1.0 to +1.0)

Default: 0 (center)

In **TRIG** mode **PANda** switches panorama position between a distinct number of predefined values.

When a voltage at trig input rises from low value and exceeds +2.5 volt, an internal trigger pulse gets initiated.

Each trigger pulse provides a “jump” to another panorama position. Direction is preset with blue knob:

>> from left to right

<> alternating from left to right and from right to left (default)

<< from right to left

rnd at each trigger position changes randomly within stereo field

With orange **pos** knob number of different positions is set.

Range: 1 to 8

Default: 5

These positions are placed in the stereo field with equal distances to each other.

In **KEYB**oard mode panorama position is controlled by pitch CV.

With blue button an offset can be added to pitch voltage. It should be adjusted to a value, which lets center of played keys match with center position in stereo field.

Range: -5 to +5

Default: +2 (this sets middle C2 key of hardware keyboards to Voltage C2 @ 0 volt)

Orange button is used to fit played keys to stereo field.

Range: 1 to 8 octaves

Default: 5 octaves (common for many synth keyboards)

A smaller width can be used to enlarge stereo impression, if **W**ide button is toggled on.

ORGAN mode is a very special function, that can create wide stereo impression. It emulates placement of pipes in church organs.

Mostly large pipe organs offer a symmetric view. This is done by placing pipes ordered by their length left or right beside a center pipe. So on each side pipe pitches differ in exactly two halftones.

Depending on instrument specification and available room space organ builders use(d) two basic designs:

large pipes (lower pitches) in center

small pipes (higher pitches) in center

With orange knob you can chose one of these designs as well as number of octaves, that should fit stereo range.

left side: **lo**wer pitches in **center**

right side: **hi**gher pitches in **center**

width (bottom up):

2 octaves

4 octaves

6 octaves

8 octaves

With blue button an **offset** can be added to pitch voltage. It should be adjusted to a value, which lets center of played keys match with center position in stereo field.

Range: -5 to +5

Default: +2 (this sets middle C2 key of hardware keyboards to Voltage C2 @ 0 volt)

You need to play a little bit with both knobs in order to find a setup, that matches played notes.

For better stereo impression with mostly narrow keys it is recommended to select less octaves. Activating stereo enlargement with **W**ide button may increase the effect.

Example presets

There are some example presets, which help you getting familiar with PANda. Each preset contains variations.

PANda Example 1.voltagepreset

PANda Example 2.voltagepreset

PANda Example 3.voltagepreset

PANda Example 4.voltagepreset

These presets are also available as free preset pack in CA Store .