INSTRUo Dual All Pass Filter User Manual

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INSTRUo Dual All Pass Filter

Specifications

- **Module Type:** Dual All-Pass Filter
- **Power Requirement:** Eurorack synthesizer system
- **Width:** 4 HP
- **Features:** Phase shifting, CV inputs, Pole toggle

Description / **Features**
The Dual All-Pass Filter module provides two independent all-pass filters for phase shifting audio signals. It features phase sliders, CV inputs for modulation, and a pole toggle to set the filter slope.

Installation

1. Confirm that the Eurorack synthesizer system is powered off.
2. Locate 4 HP of space in your Eurorack synthesizer case.
3. Connect the 10-pin side of the IDC power cable to the 2×5 pin header.

4. **Note:** This module has reverse polarity protection. Inverted installation of the power cable will not damage the module.

Channel 1

- **Input (IN):** Provides direct access to the channel 1 all-pass filter.
- **Output (OUT):** Provides the filtered signal from the channel 1 input.
- **Pole Toggle:** Sets the slope of the all-pass filter.
- **Phase Slider:** Shifts the center frequency of the filter processing the input signal.
- **Phase CV Input:** Bipolar control voltage input for modulating the phase slider.
- **Phase CV Attenuverter:** Determines depth and polarity of external modulation on phase parameter.

Channel 2

- **Input (IN):** Provides direct access to the second all-pass filter.
- **Output (OUT):** Provides the filtered signal from channel 2 input.
- **Phase Slider:** Shifts the center frequency of the filter processing the input signal.
- **Phase CV Input:** Bipolar control voltage input for modulating the phase slider.
- **Phase CV Attenuverter:** Determines depth and polarity of external modulation on phase parameter.
- **Output Indicator:** Provides LED illumination of signal amplitudes at channel 2 output.

Global Normalling
The normalling of input signals moves clockwise from channel 2 Input to channel 2 Output, suitable for mono-to-mono, mono-to-stereo, and stereo-to-stereo processing.

Patch Examples

1. **Mono Phase-Shifting:**
   An oscillator connected to channel 1's Input is monitored through channel 1's Output. Modulate the phase with a control voltage signal.
2. **Serial Mono Phase-Shifting:**
   An attenuated oscillator connected to channel 2's Input is monitored through channel 2's Output, creating a mono sum. Modulate each channel's phase with different control voltage signals.

FAQ

1. **Q: Can I use this module with other synthesizer systems?**
   A: This module is designed for use with Eurorack synthesizer systems and may not be compatible with other systems without proper adapters or converters.
2. **Q: How do I ensure proper power connection?**
   A: Make sure to connect the IDC power cable correctly, aligning the pins and avoiding reversed polarity to prevent damage to the module.

Dual All-Pass Filter

User Manual

Description
Introducing dåpf, the first dedicated effects processor in the Instruō product line. The Instruō dåpf is a set of two analogue all-pass filters.
You might be asking yourself, “What is the point of a filter that passes everything?” All-pass filters don’t actually attenuate frequency amplitudes directly, but rather alter the phase relationship of frequencies across the spectrum. All-pass filter stages appear in the vast majority of voltage-controlled filter topologies as well as serving as a core building block within DSP.
The normalled I/O of dåpf allows for cascaded or independent use of the two all-pass filter circuits, offering everything from classic phase-shifting to psychoacoustic stereo enhancement and synthetic
Doppler effect.

Features

- Two parallel all-pass filters
- Independent attenuverters for voltage control
- 1-Pole/2-Pole configuration for channel 1
- Gascaded normalisation
- Global 1 volt per octave tracking

Installation

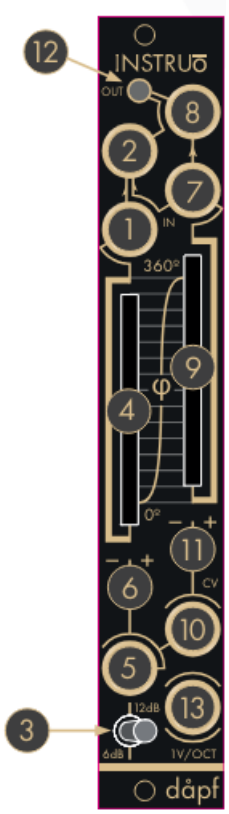
1. 1. Confirm that the Eurorack synthesizer system is powered off.
   2. Locate 4 HP of space in your Eurorack synthesizer case.
   3. Connect the 10 pin side of the IDC power cable to the 2×5 pin header on the back of the module, confirming that the red stripe on the power cable is connected to -12V.
   4. Connect the 16 pin side of the IDC power cable to the 2×8 pin header on your Eurorack power supply, confirming that the red stripe on the power cable is connected to -12V.
   5. Mount the Instruō dåpf in your Eurorack synthesizer case.
   6. Power your Eurorack synthesizer system on.

Note:
This module has reverse polarity protection.
Inverted installation of the power cable will not damage the module.

Specifications

- **Width**: 4 HP
- **Depth**: 30mm
- **+12V**: 60mA
- **-12V**: 60mA

dåpf | da:/f | (acronym) Dual All-pass Filter



Key

1. Channel 1 Input
2. Channel 1 Output
3. Pole Toggle
4. Channel 1 Phase Slider
5. Channel 1 Phase CV Input
6. Channel 1 Phase CV Attenuverter
7. Channel 2 Input
8. Channel 2 Output
9. Channel 2 Phase Slider
10. Channel 2 Phase CV Input
11. Channel 2 Phase CV Attenuverter
12. 1V/Oct Input

Channel 1

- Input (IN): The channel 1 Input (left) provides direct access to the channel 1 all-pass filter.
- Output (OUT): The channel 1 Output (left) provides the filtered signal present at the channel 1 Input.
    - If no cable is connected to the channel 1 Output, then the signal present at the channel 1 Input is processed and passed to the channel 2 Output. Either configuration can be used for mono-to-mono processing.

Pole Toggle: The Pole Toggle sets the slope of the all-pass filter.

- If the toggle is in its left position, the profile of the all-pass filter is set to – 6dB/Octave (1-Pole).

- If the toggle is in its right position, the profile of the all-pass filter is set to -12dB/Octave (2-Pole).
- **Phase Slider**: The Phase Slider shifts the centre frequency of the all-pass filter processing the input signal.
    - If the Slope Toggle is set to -6dB/Octave (1-Pole), moving the Phase Slider from its minimum position to its maximum position results in a global phase shift of the input signal by 180°.
    - If the Slope Toggle is set to -12dB/Octave (2-Pole), moving the Phase Slider from its minimum position to its maximum position results in a global phase shift of the input signal by 360°.
- **Phase CV Input:** The Phase CV Input is a bipolar control voltage input for the Phase Slider.
    - Control voltage is summed with the Phase Slider and scaled and/or inverted by the Phase CV Attenuverter.
- **Phase CV Attenuverter:** The Phase CV Attenuverter determines the depth and polarity of external modulation applied to the phase parameter.

Channel 2

- Input (IN): The channel 2 Input (right) provides direct access to the second all pass filter.
- If no cable is connected to the channel 1 Input, the signal present at the channel 2 Input normals to both all-pass filter channels. In this scenario, only the corresponding phase parameter will affect the signal present at the respective channel Output. This can be used for mono-to-stereo processing.
- If no cable is connected to the channel 1 Input or channel 1 Output, then both channel's phase parameters will affect the signal present at the channel 2 Input, creating a mono sum of both Outputs. This can be used for mono-to-mono processing with two parallel all-pass
  filter stages.
- Attenuating the input signal before connecting to the channel 2 Input is advisable to avoid clipping.
    - **Output (OUT)**: The channel 2 Output (right) provides the filtered signal present at the channel 2 Input.
- **Phase Slider:** The Phase Slider shifts the centre frequency of the all-pass filter processing he input signal.
    - Moving the Phase Slider from its minimum position to its maximum position results in a global phase shift of the input signal by 360°.
- **Phase CV Input:** The Phase CV Input is a bipolar control voltage input for the Phase Slider.
    - Control voltage is summed with the Phase Slider and scaled and/or inverted by the Phase CV Attenuverter.
- **Phase CV Attenuverter: T**he Phase CV Attenuverter determines the depth and polarity of external modulation applied to the phase parameter.
    - **Output Indicato**r: The Output Indicator provides LED illumination of the signal amplitudes present channel 2 Output.

Global

- **1V/Oct Input:** The 1V/Oct Input is a bipolar control voltage input that is calibrated for 1 volt per octave tracking.
    - Control voltage is summed with the values set by the Phase Sliders and Phase CV Inputs.

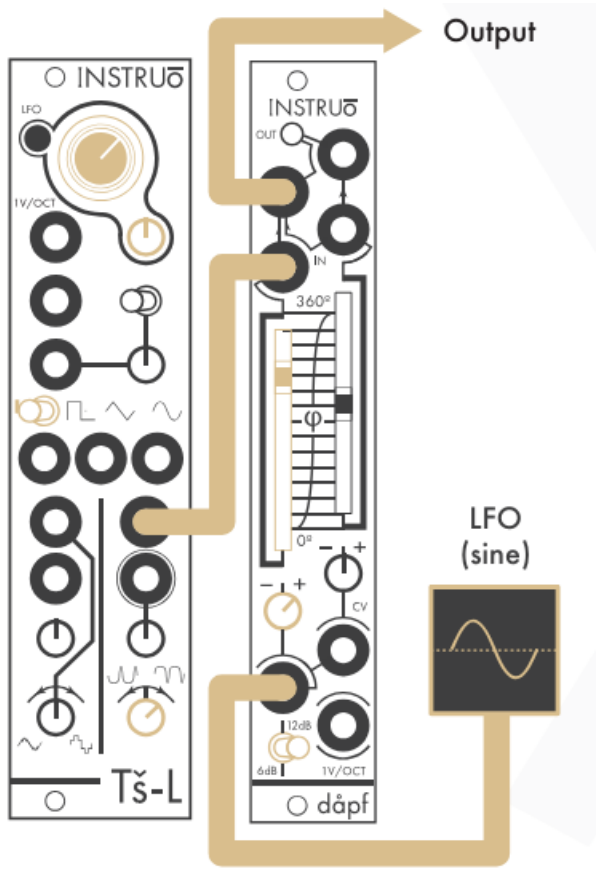
Normalling

- The normalling of input signals moves clockwise around the panel from the channel 2 Input to the channel 2 Output.

- This normalling scheme can be used for mono-to-mono, mono-to-stereo, and stereo-to-stereo processing.

Patch Examples

- **Mono Phase-Shifting:**
  - **Summary:** An oscillator is connected to channel 1's Input and monitored through channel 1's Output. A control voltage signal modulates the phase.



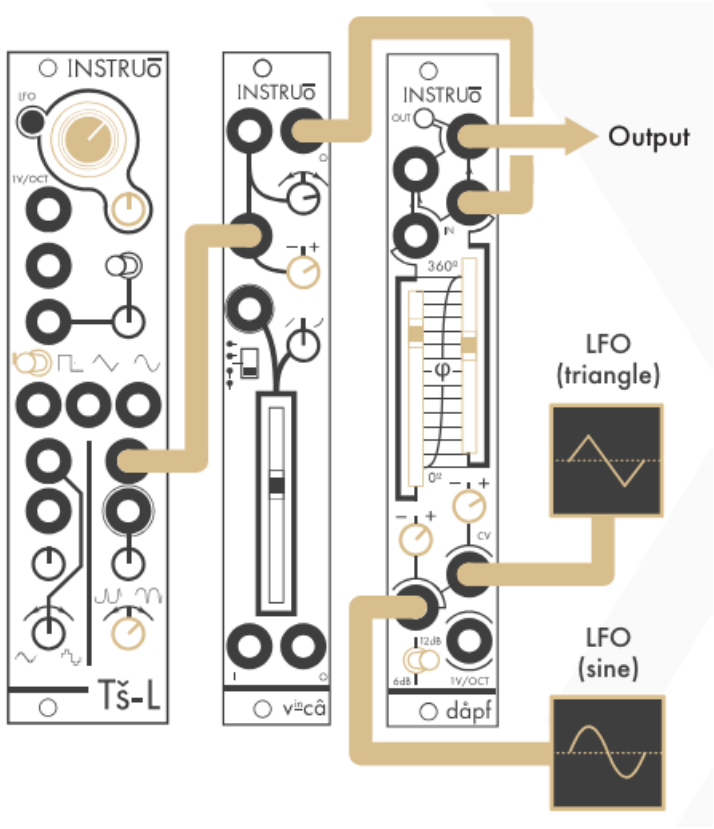
Audio Path:

- Connect the output of a harmonically rich oscillator waveform to the channel 1 Input.
- Monitor from the channel 1 Output.
- Set the Pole Toggle to a desired setting.

Control Path:

- Connect a control voltage signal to the channel 1 Phase CV Input and set the corresponding Phase CV Attenuverter to a desired position.
- **Note:** If using bipolar control voltage signals, bias the corresponding Phase Slider so that negative voltage doesn't clip the Phase CV Input.

Serial Mono Phase-Shifting:
Summary: An oscillator is attenuated and then connected to channel 2's Input and monitored through channel 2's Output, creating a mono sum of both channels. Two different control voltage signals modulate the phase of each channel.

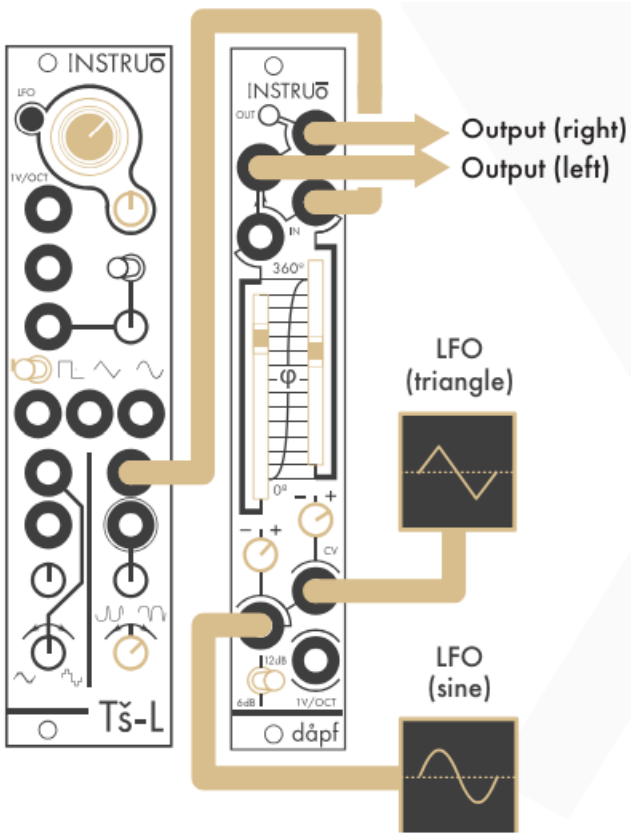


Audio Path:

- Connect the output of a harmonically rich oscillator waveform to an attenuator to attenuate the amplitude of the waveform. Set the attenuator to a desired level.
- Connect the output of the attenuator to the channel 2 Input.
- Monitor from the channel 2 Output.
- Set the Pole Toggle to its right position to set a -12dB/Oct pole for channel 1.

Control Path:
Connect two different control voltage signals to both Phase CV Inputs and set the corresponding Phase CV Attenuverters to a desired position. Note: If using bipolar control voltage signals, bias the corresponding Phase Sliders so that negative voltage doesn't clip the Phase CV Inputs.

Mono-to-Stereo Phase-Shifting:
Summary: An oscillator is connected to channel 2's Input and monitored through both Outputs. Two different control voltage signals modulate the phase of each channel.



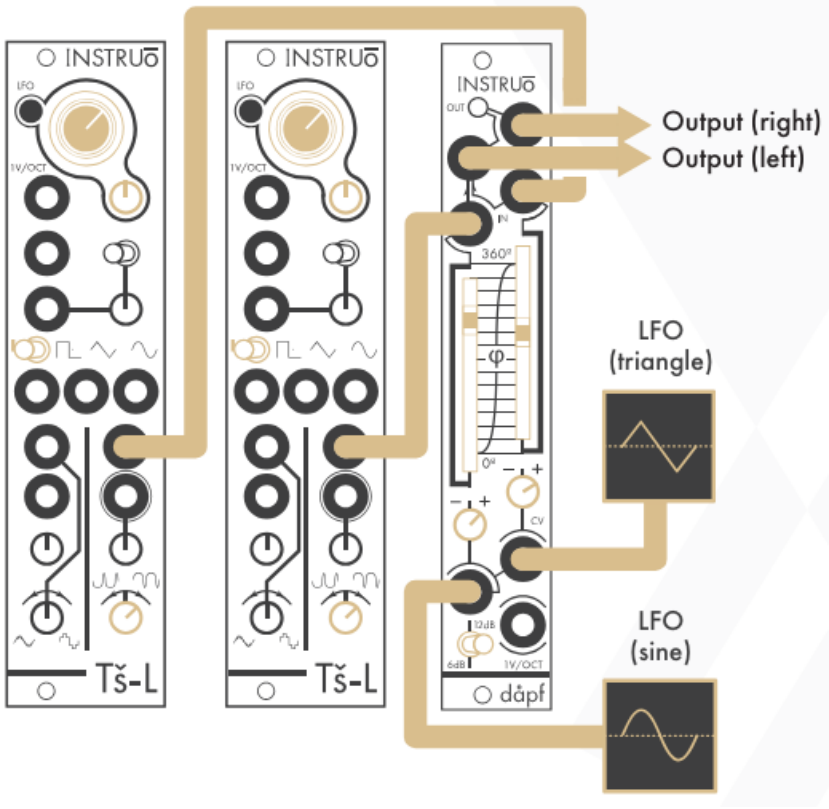
Audio Path:

- Connect the output of a harmonically rich oscillator waveform to the channel 2 Input.
- Monitor from both Outputs.
- Both outputs will need to be externally panned hard left and hard right.
- Set the Pole Toggle to its right position to set a -12dB/Oct pole for channel 1.

Control Path:

- Connect two different control voltage signals to both Phase CV Inputs and set the corresponding Phase CV Attenuverters to a desired position.
- **Note:** If using bipolar control voltage signals, bias the corresponding Phase Sliders so that negative voltage doesn't clip the Phase CV Inputs.

Stereo Phase-Shifting:
Summary: Two oscillators are connected to both Inputs and monitored through both Outputs. Two different control voltage signals modulate the phase of each channel.



Audio Path:

- Connect the outputs of two harmonically rich oscillator waveforms to both Inputs.
- Monitor from both Outputs.
- **Note:** Both outputs will need to be externally panned hard left and hard right.
- Set the Pole Toggle to its right position to set a -12dB/Oct pole for channel 1.

Control Path:

- Connect two different control voltage signals to both Phase CV Inputs and set the corresponding Phase CV Attenuverters to a desired position.
- **Note:** If using bipolar control voltage signals, bias the corresponding Phase Sliders so that negative voltage doesn't clip the Phase CV Inputs.

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Manual Design: Dominic D'Sylva

CE This device meets the requirements of the following standards: EN55032, EN55103-2, EN61000-3-2, EN61000-3-3, EN62311.

Documents / Resources

	INSTRUo Dual All Pass Filter [pdf] User Manual Dual All Pass Filter, All Pass Filter, Pass Filter, Filter

References

- User Manual