

SDS_VCO

PURE_MIDI

USER'S GUIDE

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I. Introduction

The Pure MIDI firmware for the SDS_VCO has been created to offer MIDI control from a modular rack. The 3 top knobs can be programmed to become MIDI control changers or Pitch Bend control for the same MIDI channel.

Up to 8 "Slots" can be programmed so there can be up to 24 MIDI controls from the same SDS_VCO panel which makes it a compact MIDI control by itself.

Each Slot can also be programmed with a MIDI Instrument that will be played via the T/G input and the CV input jacks.

In addition, parameters can be controlled or offset via the MOD CV input. Pitch Bend, ModWheel, Knob Offset, +/- 16 note offset, or Velocity can be programmed for each Slot if desired. The MOD CV input is bi-polar so most will work with +/- 5 volts.

A common issue with CV to MIDI converters is the T/G edge time to CV input time. Some sequencers (and other) have quite a slew between the time of a step (T/G) pulse output and the CV changing to the step. This isn't a problem with Pure MIDI as the delay time can be set from 0 mS to 15 mS.

All settings are permanent for the next power-up, so if you know what you want, you may never have to set it again!

Firmware Update:

The Pure MIDI Firmware is available at: <http://www.freshnelly.com/sdsvco/sdsvco.htm> for download in the form of an MP3 file. Simply connecting your mobile device, or a laptop etc. to the SDS_VCO via audio and playing the file will update the firmware to Pure MIDI.

- 1) If using a mobile device (iPhone/pad etc) make sure to be in airplane mode and turn off notifications/apps that may interfere with an audio mp3 file playing.
- 2) Power up the SDS_VCO module and wait for at least 12 seconds. Unplug all patches.
- 3) Turn the WAV knob fully left to select wave#0.
- 4) Plug your audio source into the CV input (top jack) with mp3 file ready to play.
- 5) Wiggle the Attack knob until the LED's all flash on and begin to countdown.
- 6) Before the LED's count down to zero start the audio file playing.

If you miss the countdown, stop & rewind the mp3 file and repeat step 5. The LED's will party for about 90 seconds, followed by the power up splash as usual.

Congrats! You now have the SDS_VCO Pure MIDI firmware alternate installed!

***On the same webpage the original SDS_VCO V.1.00 can be downloaded. I would recommend downloading it for safe keeping in case you want to revert.**

II. MIDI Panel Functions

The definitions of the panel during general use are quite simple:

- The top 3 knobs are CC1, CC2, & CC3, but any one knob can be assigned as a Pitch Bend.
- The Bottom knob (WAV) is for selecting one of the 8 Slots that have been programmed.
- The CV jack is always for selecting MIDI notes (0-5V @ 1V/Octave)
- The T/G jack is always for triggering/holding these MIDI notes.
- The MOD jack can:

0) Be Off / disconnected

1) Be an independent Mod Wheel (MIDI CC#1)

2) Be an independent Pitch Bender

3) Be a Note offset (+/- 16 notes = +/- 5V)

4) Be a knob offset to CC3 [REL] (+/- 5V)

5) Be a knob offset to CC2 [DCY] (+/- 5V)

6) Be a knob offset to CC1 [ATK] (+/- 5V)

7) Control Velocity of MIDI Notes triggered by T/G input

-The Audio OUT jack outputs a simple sine wave to match the MIDI notes.

III. Setup

Besides just selecting a Slot to use, each LED selected by the WAV knob can be "wiggled" upon to enter individual MIDI settings (rather than selecting a Slot). Wiggling the ATK knob quickly back and forth will cause all of the LED's to flash, which signals the entry into a setting selected by the LED. This in no way selects the SLOT to edit, but merely the setting that will be applied to the Slot that will be selected once inside on of the Settings modes.

*** Make sure, when wiggling the ATK knob, to stay away from the fully CCW (left) position as this is used to exit & save the setting, which hasn't been made yet.**

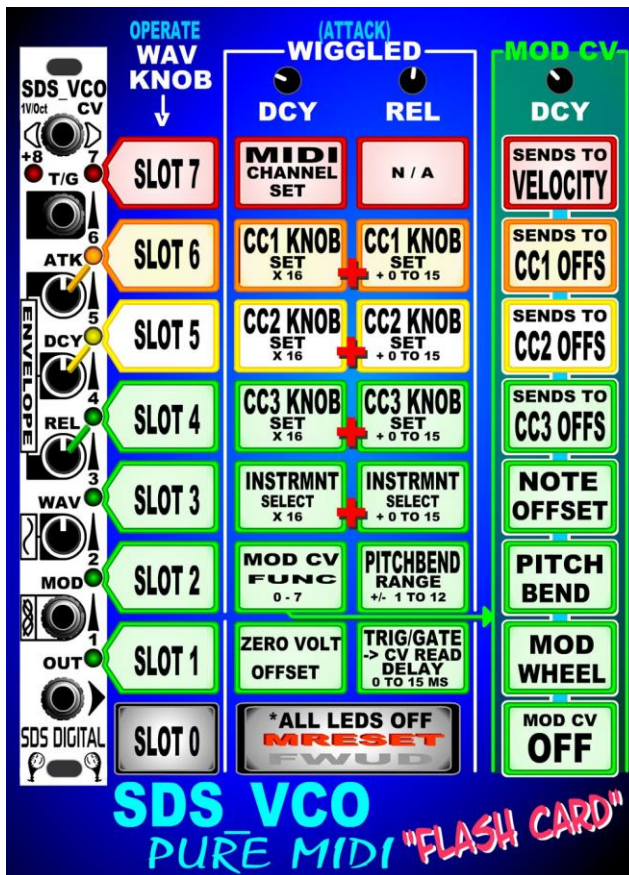
Use the "card" shown (possibly print it for reference, see webpage) as a guide while setting up the MIDI parameters.

Normal Operation: Use the WAV knob to select a Slot, LED "0" to 7, which has your instrument, knob, and MOD CV settings.

Setup: Use the WAV knob to select a setting to modify & wiggle ATK knob:

To change a setting:

- 1) Select a setting with the WAV knob as listed in the 2nd & 3rd columns.
- 2) Wiggle the ATK knob until LED's flash
- 3) Adjust the WAV knob fully left, then right to activate the SLOT you will be editing. Wait for the LED to time out.
 - *This only needs to be set once. All of the following edits will be made to this slot until changed. The SLOT to edit will be remembered until power down.
- 4) Use the DCY & REL knobs to adjust the setting you selected in step (1)
- 5) When finished, turn the ATK knob fully CCW (left) to exit & save. The LED's Will flash briefly.



*Keep in mind that the ATK knob is now turned down, so any MIDI control assigned to it in selected slot will be sent (Volume?!)

The LED's numerical representation is the same as the SDS_VCO original firmware: 0=no LED's on, 1 to 7 is LED's but +8 LED off, 8= +8 LED, 9 to 15 is LED's with +8 LED on.

Global Settings: [1]

Two settings are "across the board" and don't change with selected Slot.

Zero Volt Offset is set from MIDI Note 12 (C) +0 to 15 notes.

i.e. A @ 0V would be 9 (LED +8 and LED 1)

Trig/Gate CV Read Delay is to address any T/G->CV slew problems other modules impose.

i.e. For digital/ uP modules, set 0 or 1 mS, for slower analog+digital set 2 to 15 mS.

**Keep in mind that both of these global settings must be done at the same time!*

MOD CV Function: [2]

The MOD CV can be assigned (use DCY knob with LED "0" to 7 shown in green box on card above) to control a selected MIDI parameter for each Slot:

- LED 1) Be an independent Mod Wheel (MIDI CC#1)
 - LED 2) Be an independent Pitch-Bender (REL knob Sets Range in semitones)
 - LED 3) Be a Coarse Note offset (+/- 16 notes = +/- 5V)
 - LED 4) Be a knob offset to CC3 [REL] (+/- 5V)
 - LED 5) Be a knob offset to CC2 [DCY] (+/- 5V)
 - LED 6) Be a knob offset to CC1 [ATK] (+/- 5V)
 - LED 7) Control Velocity of MIDI Notes triggered by T/G input
- All LED's off (LED 0) Mod CV is Off / disconnected

Instrument Select: **[3]**

Wiggling on LED3 will enter Instrument Selection. The instrument is also 0-127 so is calculated the same way as a CC (see below). Using a trigger on T/G allows previewing.

Calculating CC (MIDI Control Change) Values: **[4,5,6]**

To avoid integrating 128 values into a small knob the value has been broken up as:

DCY Knob: LED x 16 (i.e. 48 would be LED 3)

-plus-

REL Knob: 0 to 15 = LED 0 to 7, LED+8 & LED 0 to 7 (i.e. 12 = LED 4 & +8)

...This yields a range of 0 to 127 (00 to 7F in Hexidecimal)

The DCY Knob allows the +8 LED also, even though the range is 0-7. This activates a Pitch-Bend assignment that is not a MIDI CC. The Pitch-Bend range can be set by wiggling on LED2. *Keep in mind that entering this setting will alter both MOD CV Func & P-B Range!

MIDI Channel: **[7]**

Wiggle on LED7 to set MIDI Channel 1-15=LED1-15 and 16=all off

LED Visuals:

The REL knob's LED is always the brighter one, while the DCY is always dimmer. This way both can be displayed at the same time. If the WAV knob is turned end to end to activate a different slot, it will "take over" the LED's for few seconds.

IV. Using Pure MIDI

Default Settings:

Upon first power-up, the factory settings will be loaded. All ATK knobs are MIDI CC#7 (volume). All DCY knobs are MIDI CC#10 (pan) and all REL knobs are MIDI CC#1 (mod). The instruments are every 16 starting at zero (acoustic piano) for variety. The MOD CV input is set to off for all 8 Slots.

Setup:

The order of setup isn't important, but as mentioned previously, setting 1 (Zero volt offset & T/G→CV Delay) should be set to reduce confusion further along.

Probably one of the first things you'll want to do is set the instruments for the slots. LED3 is wiggled upon to enter instruments.

Not mentioned above is the possibility to enter all of the instruments with only one exit/save. Once the WAV knob is turned to each end it becomes active, but won't update the selected Slot's instrument until it times out (5 seconds). Here's how:

- 1) Patch a slower T/G and CV input so you can hear the instruments
- 2) Wiggle on LED3 to enter instrument setting
- 3) Turn the WAV knob fully right, then fully left to activate then quickly to the SLOT 0-7 you want to update, start at Slot 0 if doing all of the instruments.
- 4) Wait for a few seconds and start adjusting DCY & REL to select a MIDI instrument.
- 5) Move the WAV knob to select the next SLOT and repeat step 4 to set instrument.

If you did all of them, then the last Slot selected is Slot#7. Keep in mind that that will be the Slot that will be modified the next time you enter a setting (i.e. a CC knob)

This same method can be used to program any setting, MIDI channel, MOD CV etc.

When switching to another slot, the DCY & REL knob's setting will be applied, so say you wanted to set MOD CV to control velocity: Wiggle on LED2, set DCY to LED7, then activate SLOT change with WAV knob. Let it time out on each SLOT and "Velocity" will be assigned for each.

Mod CV Function:

You may have noticed the MOD CV functions align with the settings descriptions for DCY and REL from setting 2 to 6. This was intentional to maybe assist in setting the MOD function.

I Hope you enjoy the Pure MIDI alternate firmware for the SDS_VCO!

SDS*