

PedalSync™

MIDI Pulse chip MV-61



PedalSync MIDI Pulse chip MV-61 outputs Line 6™ MIDI tempo data that is synchronized to an incoming MIDI Clock. MV-61 also features adjustable Output Ratio, Output Timing Offset, and a User-Assignable Switch.

PedalSync MIDI Pulse chip MV-61 is compatible with Floor POD Plus, POD 2.0, POD Pro, POD XT, Bass POD XT, POD X3 Live, POD X3 Pro, Vetta II, Vetta II HD, Flexitone III, HD 147, Pocket POD, and Gear Box Software. See *Line 6 MIDI Continuous Controller Reference Guide*.

Key Features

- MIDI Pulse outputs synchronized to the incoming MIDI Clock
- Stores and recalls Output Ratio, Output Offset, and User Switch Status
- Ratio control multiplies or divides the output against the incoming clock for syncopation
- Offset control allows users to independently offset the output timing up to 360 degrees
- Tap “One-Shot”™ Button for setting tempo without MIDI Clock present
- User-assignable switch input and output
- Active filtering of unwanted MIDI data
- Robust, 128 program storage
- Simple, intuitive user interface
- Fully Compatible with MIDI
- Scalable - combine chips like building blocks to make elaborate designs
- Efficiently Designed to ensure Low part count
- Responds to PedalSync self-programming MIDI commands
- Thru-Hole or SMT
- Use PedalSync™ trademark on your devices and in advertising

MIDI Connections

MV-61 uses the following MIDI connections:

MIDI Output (TX) (pin 22)

MV-61 sends Line 6 MIDI Pulse data (CC64) in time with the incoming MIDI Clock. At 1:1 ratio, this corresponds to each quarter note.

MIDI Pulse data is also sent each time the Tap “One-Shot” Button is pressed.

MV-61 also actively filters incoming MIDI data as set forth in the MIDI IMPLEMENTATION CHART.

All Line 6 MIDI data is sent on Channel 1.

MIDI Input (RX) (pin 21)

MIDI Clock and other data is received at the MIDI Input pin.

MV-61 also actively filters incoming MIDI data as set forth in the MIDI IMPLEMENTATION CHART.

MIDI IMPLEMENTATION CHART

Function	Filtered	Generated	Comment
Note On	O	X	
Note Off	O	X	
Aftertouch	O	X	
Control Change	Y	Y	Incoming CC64 data is filtered, all others passed through.
Program Change	Y	X	Program Changes received on Channel 15 are converted to Channel 1.
Channel Pressure	O	X	
Pitch Bend	O	X	
System Common	Y	X	All System Common messages filtered except Song Select [F3].
System Exclusive	X	X	** MV-61 also responds to PedalSync self-programming commands.
System Realtime	O	X	MV-61 responds to MIDI Start and MIDI Clock data.

O = YES, X = NO, Y = See Comment

MIDI Compatibility

The MIDI channel for the PedalSync system is MIDI Channel 15. MV-61 also responds to Program Change messages on Channel 1. MIDI Program Change messages on any other channel are ignored by the chip.

The MIDI Pulse chip will respond to standard MIDI Start and Clock messages, as well as PedalSync self-programming commands from MASTER CONTROL and TEMPODE.

Note: The MIDI Pulse chip is compatible with Running Status format Program and Control Change data.

User Interface

Tempo LED

(pin 10)

The Tempo LED flashes in time with the outgoing MIDI Pulse data. The Tempo LED reflects ratio and offset adjustments.

Ratio Pot

(pin 2, pot 0)

The Ratio pot multiplies or divides the rate of the MIDI Pulse Output relative to the incoming clock.

The Ratios are based on nine (9) musical subdivisions: two whole notes; whole note; half note; half note triplet; quarter note (tap speed); quarter note triplet; 8th note; 8th note triplet; 16th note. As a result, synchronized devices can switch at different yet complimentary rates.

Offset Pot

(pin 4, pot 2)

The Offset pot adjusts the relative MIDI Pulse Output timing against the incoming clock with up to 360 degrees of offset shift. As a result, the pulses can accent, syncopate, push the beat, or get right in the pocket.

Tap “One-Shot”™ Button

(pin 25)

Pressing the Tap “One-Shot” button sends a single Line 6 MIDI Tap Tempo command. This is useful for setting the tempo on Line 6 devices when no MIDI Clock is present.

USER Button (pin 23)

Pressing the momentary USER button toggles the corresponding output pin (24).

USER Output (pin 24)

Pin 24 can be used to control the PedalSync Relay Bypass chip (MV-57). The program default for the USER Output is OFF (low). If using the Relay Bypass chip (MV-57), this corresponds to having the device bypassed.

The Bypass buttons and outputs can alternately control other device features such as different signal paths.

If more than one circuit is connected to the output, be sure to use a buffer.

Program Storage

The MIDI Pulse chip stores 128 programs. Programs are stored by toggling the Write Switch (pin 16) or upon a command from the PedalSync MASTER CONTROL or TEMPODE.

Write Switch (pin 16)

Using a toggle switch, the user will switch down then up again to write the current settings to the currently selected program. If the switch is in the down position, the user will need to go up, down, then up again.

It is possible to use a momentary pushbutton for the Write switch, however a toggle switch is recommended to make it difficult for users to inadvertently program a setting.

Program Recall

Programs are recalled using the PedalSync Master Controller, standard MIDI Program Change messages on Channels 1 or 15, or the PedalSync 4 Presets chip (MV-59).

Status LED (pin 17)

The Status LED is normally on. When a program is written, the Status LED will blink.

Whenever the potentiometers are not stable (*i.e.* when they are moving or have recently moved), the Status LED will turn off until they become stable again. Each pot will stabilize after approximately three (3) seconds of no motion.

Program Defaults

- USER Output Low
- Offset = zero
- 1:1 Ratio

Electrical Considerations

The schematic on page 7 shows the necessary connections. Note that you can use different resistors for the LEDs depending on the type of LED used, but do not exceed the current limits of the underlying chip.

If you require brighter LEDs, consider using buffers for the LEDs that connect directly to the chip, or use ultra-bright LEDs.

Place C16 as close as possible to Pin 13.

Place C2 as close as possible to Pin 20.

Place C1 as close as possible to Pins 27 and 28.

The datasheet for the underlying dsPIC33FJ64GP202 chip can be found [here](http://www.microchip.com/wwwproducts/Devices.aspx?dDocName=en532310):
<http://www.microchip.com/wwwproducts/Devices.aspx?dDocName=en532310>

Pin Voltage and Current Limits

Pin	Max Voltage	Max Current*
1	5	4
2	3.3	12
3	3.3	12
4	3.3	12
5	3.3	12
6	3.3	4
7	3.3	4
8	GND	
9	3.3	4
10	3.3	25
11	3.3	12
12	3.3	4
13	3.3	
14	5	12
15	5	12
16	5	4
17	5	12
18	5	12
19	GND	
20	N/A	
21	5	12
22	5	12
23	3.3	4
24	3.3	4
25	3.3	4
26	3.3	4
27	GND	
28	3.3	

* 200 mA max current sink or source for the whole chip at any given time, except on the Module which is limited to ~50 mA. Keep your currents low to minimize noise.

Noise

It is very important to properly filter your power supply as shown in the schematic.

Follow proper PCB layout design rules and isolate the digital and analog sections of your circuit as much as possible, connecting the grounds at a common point at the power supply.

Related Products

- Use with the PedalSync Master Control Dev. Board to store 128 programs and their associated tempos
- Use with PedalSync Relay Bypass chip MV-57B or module to add silent true bypass switching

Support

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