

IMP-3PDT – 2nd Generation

Installation and Usage

This document describes the installation and usage of the Imp-3PDT MIDI mod of the 2nd generation. For a description of the product, its features and further information visit <https://oscillatordevices.com/imp>

Electrical Properties

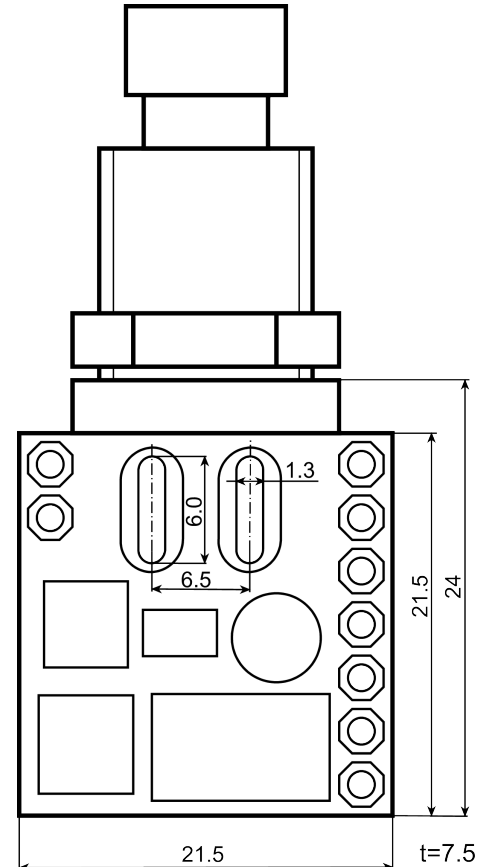
Electrical Properties	Min	Typ	Max	
Supply Voltage (+9V Terminal)	7	9	20	VDC
Current Consumption	3		33	mA
Maximum voltage at LED terminal			20	VDC
Output voltage at SW terminal			5	VDC

The Imp-3PDT has reverse polarity protection at the +9V terminal. Be careful nonetheless to not reverse polarity upon installation, as long as other wires are connected. Negative currents could flow through the microcontroller and damage it.

Attention: Digital signals, such as MIDI signals, can lead to crosstalk on other lines. This particularly applies to effects with multiple gain stages (distortion, fuzz, etc.). Pay attention to keep the MIDI wires as far away from the analog circuit as possible. Otherwise it can happen that a click can be heard in the audio signal with every MIDI command. To further reduce possible crosstalk, use shielded wires.

Mechanical Properties

Make sure to have at least 24 mm room under the switch.

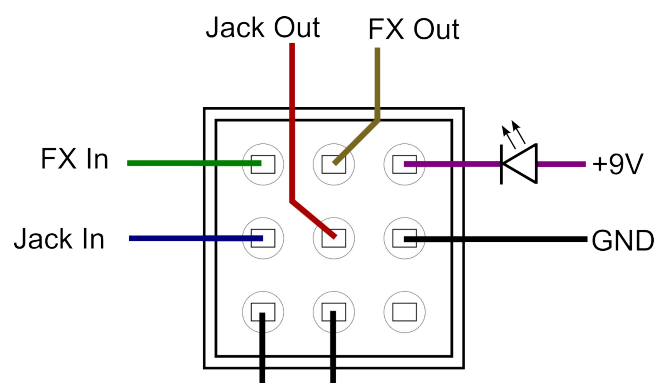


Installation

The Imp-3PDT is made to replace a 3PDT switch how it's found in guitar effects pedals. In the "On" state, **Jack In** is connected to **FX In**, **Jack Out** to **FX Out** and the **LED** to **GND**. In the "Off" state **Jack In** is connected to **Jack Out** via the bridge and the **LED** is left open. The wiring can be different than in the picture, but you'll almost always find those 5 signals.

If the wiring isn't clear grab a DMM and proceed as follows:

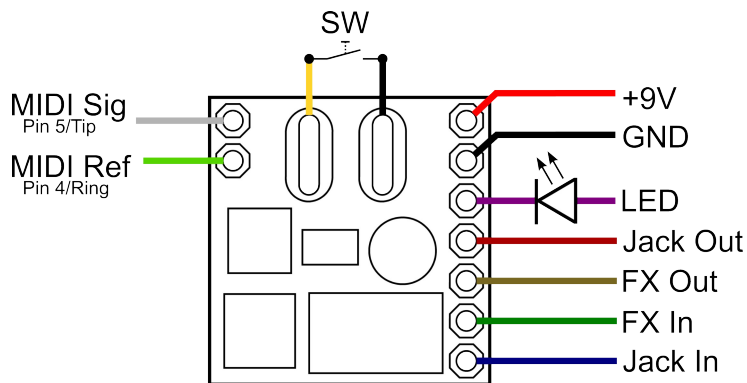
- Plug patch cables into the input and output jack, so the sockets aren't shorted to GND.
- Switch the effect **Off** and measure which pins of the switch connect to the in and output jack. This should be at least four pins. Write them down. One of them is **Jack In** and one of them **Jack Out**
- Switch the effect **On** and measure which pins are connected to the input jack. These should be two pins. **Jack In** and **FX In**. **Jack In** is one of the pins of the previous step. **FX In** is the other. Do the same with the output jack.
- Switch the effect **Off** and locate the LED. Check which pin is connected to one of the pins of the LED.



Example wiring of a 3PDT switch in a guitar effects device

Connect the signals as follows:

- **+9V and GND:** This is the power supply. Connect them directly to the DC jack of the guitar pedal.
- **LED:** Connect the LED here. This is a 20V MOSFET that switches to GND, when the effect is on.
- **Jack Out:** Connect the output jack here.
- **FX Out:** Connect the output of the FX (or the wet signal) here.
- **FX In:** Connect the input to the FX here.
- **Jack In:** Connect the input jack here.
- **SW:** If the Imp-3PDT hasn't a switch soldered on, solder your own SPST switch here or connect wires to a remote switch.
- **MIDI Sig:** This is the active MIDI signal. It is connected to **Pin 5** of a DIN 5-PIN MIDI Connector, or **Tip** if a TRS connector according to MIDI standard (Type A) is used.
- **MIDI Ref:** This is the reference MIDI signal. It is connected to **Pin 4** of a DIN 5-PIN MIDI Connector, or **Ring** if a TRS connector according to MIDI standard (Type A) is used.



Recommended order

- Start with the power supply (+9V and GND). When connected, power up the Imp and check if the switch works. You can see it by checking the integrated red LED. It's between the switch terminals. It should toggle on and off, when the switch is pressed. You should also hear a faint clicking sound from the relay.
- Next, connect the MIDI wires. That way you can check if MIDI works, early on. With CC 20 02 the internal LED should toggle on and off. Also, the internal LED should flicker, when the Imp receives MIDI messages. The Imp is shipped in omni mode, i.e. it reacts to every channel. If it's not working, try to switch the MIDI wires.
- Finally you can connect LED, Jack In/Out and FX In/Out. Don't forget to test if the guitar signal is passed through, before putting everything together.

MIDI Channel

To change the MIDI channel with the switch, follow the steps below:

1. Disconnect the device from the power supply.
2. Press and hold the foot switch and connect the device to the power supply. The device starts to flash its LED.
3. Press the foot switch according to the number of the MIDI channel you wish to set (e.g. twice for MIDI channel 2). The Imp acknowledges this by emitting short flashing pulses corresponding to the number of the desired MIDI channel.
4. Once the desired channel is set, press and hold the switch until the **Imp** switches off completely.
5. Disconnect supply voltage. The next time the **Imp** is started, it reacts to the new MIDI channel.

To put the Imp in omni mode (i.e. it responds to every channel) skip step 3.

To change the MIDI channel with MIDI commands send the following commands one after another without any other command in between, with `<ch>` being the desired MIDI channel: CC 15 `<ch>`, CC 09 18, CC 09 52, CC 09 01

MIDI commands

CC	#	Function	#	Function
20	00	Effect off (Bypass)	16	Toggle to the beat of the MIDI clock in 1/2 notes
	01	Effect on	17	Toggle to the beat of the MIDI clock in whole notes
	02	Toggle (On to off or off to on)	18	Toggle to the beat of the MIDI clock every 2nd whole note
	10	Toggle to the beat of the MIDI clock in 1/4 notes	19	Toggle to the beat of the MIDI clock every 3rd whole note
	11	Toggle to the beat of the MIDI clock in 1/8 notes	20	Toggle to the beat of the MIDI clock every 4th whole note
	12	Toggle to the beat of the MIDI clock in triplet notes	21	Toggle to the beat of the MIDI clock every 5th whole note
	13	Toggle to the beat of the MIDI clock in 1/16 notes	22	Toggle to the beat of the MIDI clock every 6th whole note
	14	Toggle to the beat of the MIDI clock in dotted 1/8 notes	23	Toggle to the beat of the MIDI clock every 7th whole note
	15	Toggle to the beat of the MIDI clock in 1/32 notes	24	Toggle to the beat of the MIDI clock every 8th whole note