IMP-2PDT
Installation and Usage

This document describes the installation and usage of the Imp-2PDT MIDI mod. 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 (V+ 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-2PDT** has reverse polarity protection at the V+ 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.
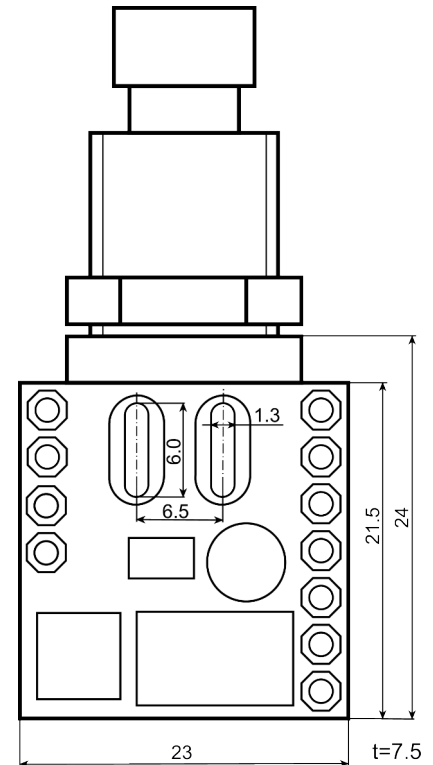
Installation

The **Imp-2PDT** is made to replace a 2PDT (or DPDT) relay. In the **"On"** state, **A1** is connected to **C1** and **A2** is connected to **C2** and **LED** is connected to GND. In the **"Off"** state **B1** is connected to **C1** and **B2** is connected to **C2** and **LED** is left open.

- **V+ and GND**: This is the power supply. Connect them directly to the DC jack of the guitar pedal. Don't exceed 20VDC.

- **V_{LED}**: Connection for a LED. This is a 20V MOSFET that switches to GND, when the effect is on. **Make sure to use a series resistor.**

- **SW**: If the Imp-2PDT 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.

- **A1, B1, C1 and A2, B2, C2**: These are the relay connections. Refer to the picture for the wiring.
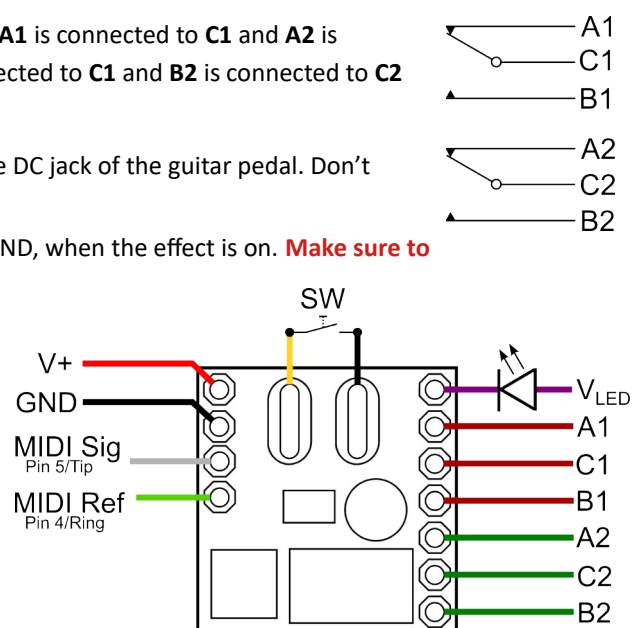
Recommended order

- Start with the power supply (V+ 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 and the relay wiring. Don't forget to test if 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 00

MIDI Commands

CC	#	Function		#	Function
	00	**B1 → C1, B2 → C2 (Off State)**		16	Toggle to the beat of the MIDI clock in 1/2 notes
	01	**A1 → C1, A2 → C2 (On State)**		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
20	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

LED Polarity

If you want the LED to light up, when C1 is connected to B1 and C2 is connected to B2, send the following commands without any other command in between: CC 17 01, CC 09 18, CC 09 52, CC 09 01.

To reset to normal polarity send: CC 17 00, CC 09 18, CC 09 52, CC 09 01.

Choosing the MIDI command

By default CC 20 is the command to operate the **Imp**. If you want to have several **Imps** in a pedal you can either assign every **Imp** its own channel, or you can change the CC command the **Imp** reacts to.

Send the following commands without sending any other command in between: CC 18 *<cc>*, CC 09 18, CC 09 52, CC 09 02. Replace *<cc>* with the desired CC command. For example, if you want to use CC 50 send CC 18 50, CC 09 18, CC 09 52, CC 09 02.

Following CC commands are reserved and cannot be used: CC 09, CC 15, CC 17, CC 18.