TRASH PANDA
## QUAD
User Manual

The **Oscillator Devices Trash Panda Quad** is a MIDI controllable expression pedal splitter. Plug an expression pedal into the expression input and control up to four effects pedals with it. Either control one pedal at the time in manual mode, or control several pedals at a time in preset mode. When using MIDI every expression output can be controlled individually and the **Trash Panda Quad's** internal LFO can drive the expression outputs with 3 different waveforms, synced to MIDI clock.
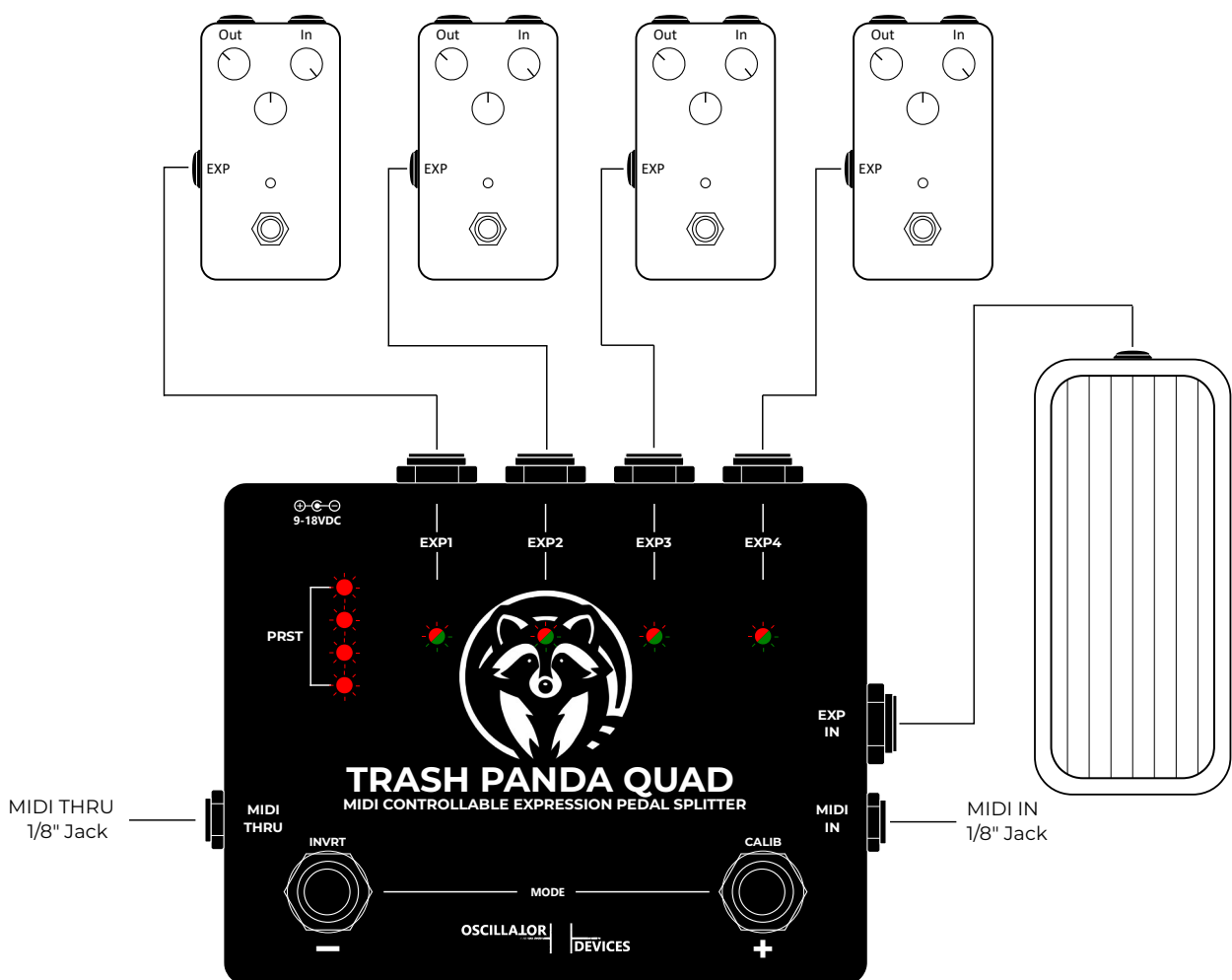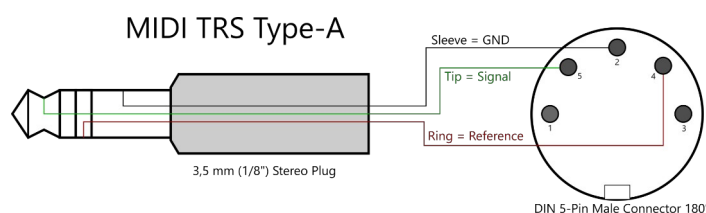

Please disconnect all devices from the power supply, before making any connections.

Caution: Under no circumstances should there be more than +5V or negative voltages be applied to any expression socket.

Connections

- **EXP1/2/3/4:** Expression outputs. 1/4'' stereo jack sockets wired like a standard expression pedal and thus will fit most common pedals. Every *EXP* has a corresponding dual color LED to represent the state of the expression output. It lights green in the heel position, shifts to orange in the middle position and gradually fades to red towards the toe position.

- **EXP IN:** The expression pedal input. Connect a standard expression pedal (resistance does not matter) here to directly control one or more of the expression outputs.

- **Power:** Power supply 9-18V. 2.1mm barrel connector, center negative. This corresponds to the standard "Boss-Style" power supply. Current consumption maximum 180mA.

- **MIDI In/Thru**: 1/8" stereo jack sockets according to MIDI standard for MIDI TRS (**MIDI TRS-Type A**).

MIDI TRS Type-A

Sleeve = GND
Tip = Signal
Ring = Reference

3,5 mm (1/8") Stereo Plug

DIN 5-Pin Male Connector 180°

Modes

The *Trash Panda Quad* has 3 main modes. By pressing and holding both footswitches, you can switch between *Manual Mode* and *Preset Mode*. By unplugging the expression pedal at the expression input, you automatically enter the *MIDI Mode*. Regardless, MIDI commands can be sent in every mode.

Mode 1: Manual Mode

When none of the preset LEDs light up, the *Trash Panda Quad* is in *Manual Mode*.

In *Manual Mode* you can control one of the expression ouputs (*EXP1/2/3/4*) at a time with the expression pedal plugged into the expression input. The corresponding LED of the output that is connected to the expression pedal input will light up. The expression outputs that are not active will stay at the last posititon, until selected again. Every expression output can be inverted individually (Heel on the expression input is toe at the output and vice versa)

Footswitch	Action	Function
+/CALIB Footswitch	Press	Selects the next expression out to be active
	Hold 3s	Enters the calibration procedure (see section Calibration Procedure)
-/INVRT Footswitch	Press	Selects the previous expression output to be active
	Hold 3s	Inverts the active expression out (This is saved permanently)

When in *Manual Mode*, the active expression output can be selected via MIDI, too. Just send the corresponding PC message. (When the PC messages of your MIDI controller start at 0, subtract 1 → PC 0 = EXP1).

PC	Function
n	Select expression out n

For more commands to extent the functionality of the *Manual Mode* see section MIDI Commands for Preset and Manual Mode.
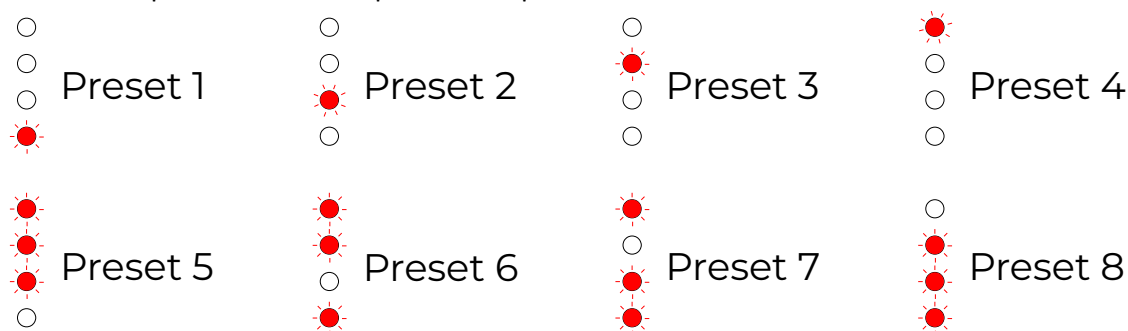
Mode 2: Preset Mode

When one or more of the preset LEDs light up, the ***Trash Panda Quad*** is in ***Preset Mode***.

In ***Preset Mode*** one or more expression outputs can be active at the same time and the direction can be inverted individually. Like in ***Manual Mode***, the corresponding LED of the outputs that are controlled by the expression pedal input will light up. The expression outputs that are not active will stay at the last posititon, until selected again.

Footswitch	Action	Function
+/CALIB Footswitch	Press	Selects the next preset
	Hold 3s	Enters the calibration procedure (see section Calibration Procedure)
-/INVRT Footswitch	Press	Selects the previous preset
	Hold 3s	Enters the preset save procedure (see section Preset Save Procedure)

There are 8 presets that correspond to the preset LEDs like this:

Preset 1   Preset 2   Preset 3   Preset 4

Preset 5   Preset 6   Preset 7   Preset 8

When in *Preset Mode*, the presets can be selected via MIDI, too. Just send the corresponding PC message (When the PC messages of your MIDI controller start at 0, subtract 1 → PC 0 = Preset 1).

PC	Function
n	Select preset n

For more commands to extent the functionality of the *Preset Mode* see section MIDI Commands for Preset and Manual Mode.

Preset Save Procedure

To save a new preset, proceed like this.

- Make sure you're in ***Preset Mode*** and the preset you want to overwrite is selected.

- Press and hold the left footswitch (**-/INVRT**) for 3s. The preset LEDs of the selected preset starts flashing along with the LED of ***EXP1***. Use the same footswitch (**-/INVRT**) to choose if ***EXP1*** will be:

  - Active with normal direction (LED flashes green)

  - Active with inverted direction (LED flashes red)

  - Inactive (LED is off)

  You can cycle through these three options as many times as you like.

- When the desired behaviour is set, press the right footswitch (**+/CALIB**) to proceed to the next ***EXP.***

- When all four ***EXP*** are set the way you like it, press and hold the right footswitch (**+/CALIB**). The LEDs flash fast a few times. The preset is saved.

To cancel the Preset Save Procedure, press and hold the left footswitch (**-/INVRT**).

Mode 3: MIDI Mode

When no expression pedal is connected to the expression input, the ***Trash Panda Quad*** is in ***MIDI Mode***.

In MIDI mode all corresponding EXP LEDs are on and show the state of the expression outputs. The footswitches have no function.

Calibration Procedure

Sometimes you may notice that an particular expression pedal doesn't reach full heel or full toe. The calibration procedure is a way to tell the ***Trash Panda Quad*** where is full heel position and full toe position.

To calibrate a new expression pedal, proceed like this.

- In ***Preset Mode*** or ***Manual Mode*** press and hold the right footswitch (**+/CALIB**) for 3s. The *EXP* LEDs start flashing green and the preset LEDs show the position of the expression pedal before calibration.

- Move the expression pedal to heel position and press the right footswitch (**+/CALIB**) again. The *EXP* LEDs start flashing red.

- Move the expression pedal to toe position and press the right footswitch (**+/CALIB**) again. All LEDs flash fast a few times. The expression pedal heel and toe positions are saved.

To cancel the Calibration Procedure, press the left footswitch **(-/INVRT)**.

MIDI Channel

The ***Trash Panda Quad*** ships in omni mode (i.e. it responds to every channel).

The MIDI channel can be set in two ways. With the **+/CALIB**-Footswitch, or with a MIDI command.

To change the MIDI channel using the **+/CALIB**-Footswitch, proceed as follows:

1. Disconnect the device from the power supply

2. Press and hold the **+/CALIB**-Footswitch and restore the power while the footswitch is pressed.

3. After the boot process is complete, the device starts to flash its LEDs. Press the footswitch according to the number of the desired channel (e.g. twice for channel 2). The ***Trash Panda Quad*** acknowledges this by emitting short flashing pulses corresponding to the number of the channel.

4. Once the desired channel is set, press the footswitch and hold it down until all LEDs stop flashing.

5. Disconnect the supply voltage. The next time the ***Trash Panda Quad*** is started, it reacts to the selected MIDI channel.

To put the ***Trash Panda Quad*** in omni mode skip step 3.

To change the MIDI channel via MIDI command, the following two commands are sent directly one after the other.

CC	#	Function
119	0-16	Set MIDI channel 1-16, 0 for Omni
119	127	Saving the MIDI channel. The Device restarts.

Generic MIDI Commands

The expression out has 256 steps. The first two line of commands distributes the entire range over 128 steps. The high-resolution commands on line 3 and 4 can be used to set a precise value.

CC				#	Function
EXP1	EXP2	EXP3	EXP4		
20	40	60	80	0-127	Expression out from heel (0) to toe (127)
21	41	61	81	0-127	Expression out from toe (0) to heel (127)
22	42	62	82	0-127	Expression out from heel (0) to middle position (127)
23	43	63	83	0-127	Expression out from middle position (0) to toe (127)

To set all four expression outputs to the same value at the same time, use the following command.

CC	#	Function
102	0-127	All Expression outs from heel (0) to toe (127)

MIDI Commands for Preset and Manual Mode

When in *Preset* or *Manual Mode*, there are some commands to enhance the possiblities.

Use the following commands to activate or deactive a certain expression out. Note that these are set back as soon as you select a new preset (*Preset Mode*), or select a different expression out (*Manual Mode*).

CC	#	Function
103	0-3	Activate EXP1 (0), EXP2 (1), EXP3 (2), or EXP3 (2)
104	0-3	Deactivate EXP1 (0), EXP2 (1), EXP3 (2), or EXP3 (2)

With the following command, the expression value of the active expression outs can be set.

| CC	#	Function
105	0-127	Set expression value from all active expression outs from heel (0) to toe (127)

To save on MIDI commands there are commands to activate/deactivate all expression outputs at the same time. Which one is selected is binary encoded. CC 106 00 is all off, CC 106 15 is all on, for example.

CC	#	EXP1	EXP2	EXP3	EXP4
106	00	Deactivated	Deactivated	Deactivated	Deactivated
	01	**Activated**	Deactivated	Deactivated	Deactivated
	02	Deactivated	**Activated**	Deactivated	Deactivated
	03	**Activated**	**Activated**	Deactivated	Deactivated
	04	Deactivated	Deactivated	**Activated**	Deactivated
	05	**Activated**	Deactivated	**Activated**	Deactivated
	06	Deactivated	**Activated**	**Activated**	Deactivated
	07	**Activated**	**Activated**	**Activated**	Deactivated
	08	Deactivated	Deactivated	Deactivated	**Activated**
	09	**Activated**	Deactivated	Deactivated	**Activated**
	10	Deactivated	**Activated**	Deactivated	**Activated**
	11	**Activated**	**Activated**	Deactivated	**Activated**
	12	Deactivated	Deactivated	**Activated**	**Activated**
	13	**Activated**	Deactivated	**Activated**	**Activated**
	14	Deactivated	**Activated**	**Activated**	**Activated**
	15	**Closed**	**Closed**	**Closed**	**Closed**

LFO Waveforms

The *Trash Panda Quad* has an internal, MIDI clock synchronous, LFO engine with 3 waveforms to drive the expression outputs. These are the basic commands for selecting the waveform and starting point. Refer to the following chapters how to alter these commands to change speed and range.

CC					Function		#	Function
EXP1	EXP2	EXP3	EXP4	#				
30	50	70	90	0	Stop LFO		50	LFO square wave with starting point A
				1	Restart LFO		60	LFO square wave with starting point B
				10	LFO sine wave with starting point A		90	LFO sawtooth forward with starting point A
				20	LFO sine wave with starting point B		100	LFO sawtooth forward with starting point B
				30	LFO sine wave with starting point C		110	LFO sawtooth backward with starting point C
				40	LFO sine wave with starting point D		120	LFO sawtooth backward with starting point D
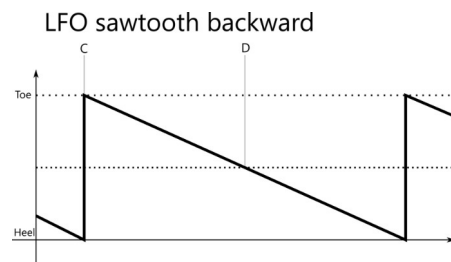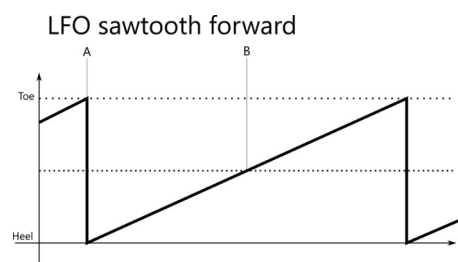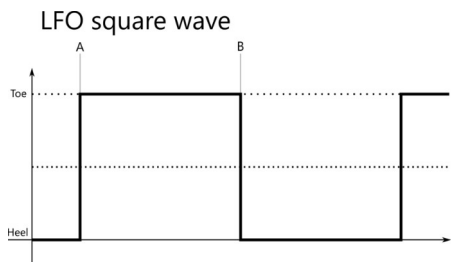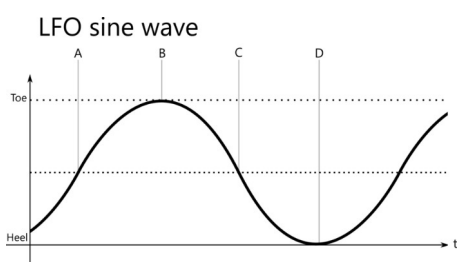
The LFO starts immediately at the specified starting point. Resending the commands will reset the engine to start over from the starting point.

LFO Speed

The speed of the LFO, relative to MIDI clock, can be increased or decreased. The commands above (CC30/50/70/90) perform one pass of the waveform per 1/4 note. The commands to change the speed are determined by adding to the basic command (CC30 10, CC 30 20 etc.).

- Basic Command: Normal speed
- Basic Command+1: Half speed
- Basic Command+2: Double speed
- Basic Command+3: Quarter speed
- Basic Command+4: Quadruple speed

For example:

CC					Function
EXP1	EXP2	EXP3	EXP4	#	
30	50	70	90	10	LFO sine wave with starting point A, speed normal (1/4 Note)
				11	LFO sine wave with starting point A, half speed (1/2 Note)
				12	LFO sine wave with starting point A, double speed (1/8 Note)
				13	LFO sine wave with starting point A, quarter speed (Whole Note)
				14	LFO sine wave with starting point A, quadruple speed (1/16 Note)

This procedure can be applied to all waveforms. E.g. rectangle with starting point B in 1/8 notes: CC 30 62

LFO Parameter (Expression)

The waveforms set this way always runs through the entire range, from heel to toe. The range can be reduced and the center point moved. The waveforms are shifted in 13 steps, with step 6 being the waveform in the middle. This corresponds to the *Offset* in the graphic.
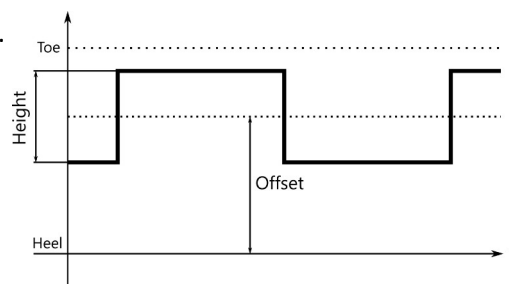
CC					Function
EXP1	EXP2	EXP3	EXP4	#	
31	51	71	91	00	Offset 0. The middle of the waveform is at Heel
				60	Offset middle: The middle of the waveform is right between the heel and toe (default)
				120	Offset Max: The middle of the waveform is at Toe

All values in increments of 10 are valid.

In addition to the shift, the height of the waveforms can also be restricted. This corresponds to *Height* in the graphic. As with command CC 20/40/60/80, this parameter is calculated by addition to the basic command.

- Basic Command: Normal Height
- Base Command+1: Half Height
- Base Command+2: Quarter Height
- Base Command+7: Height 1/128

For example:

CC					Function
EXP1	EXP2	EXP3	EXP4	#	
27	47			60	No constraint on height, waveform sweeps full range (default)
				61	Waveform height halved
				62	Waveform height 1/4
				63	Waveform height 1/8
				…	
				67	Waveform height 1/128

The *Offset* and *Height* settings persist across a new waveform. Reset with CC 31 60.

Examples

Controlling a filter pedal with LFO expression: This is for controlling a simple low pass filter pedal with a LFO over an expression out.

Function LFO	Function TRS	CC commands	Description
1/4 notes sinus sweep	Expression LFO on TRS1	CC 30 10	Expression out of TRS1 controls the filter and sweeps in 1/4 notes sinus in sync to MIDI clock.
1/8 notes sawtooth forward sweep	Expression LFO on TRS1	CC 30 92	Expression out of TRS1 controls the filter and sweeps in 1/8 notes sawtooth forward in sync to MIDI clock
1/2 notes sinus sweep w/ reduced range	Expression LFO on TRS2	CC 30 11 + CC 31 61	Expression out of TRS2 controls the filter and sweeps in 1/2 notes sinus in sync with MIDI clock with half the full range.