



MIDI-Solutions and Custom FX

# Garbage Collector 1.0

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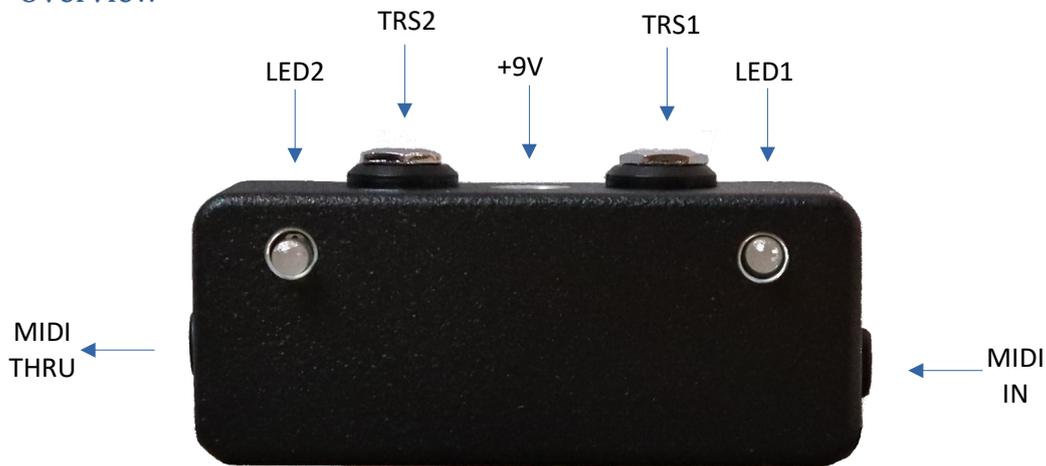
# 1 Introduction

## 1.1 Wait, what?!

The **Oscillator Devices Garbage Collector** is a MIDI controllable foot switch. All applications in which external foot switches are used (e.g. tap tempo on guitar pedals, channel switches on amplifiers) can be executed automatically by the **Garbage Collector**. The **Garbage Collector** can be synchronized with MIDI clock and thus synchronize time-based effects. It can emulate two foot switches with two channels each. The MIDI channel is adjustable and complex switching functions can be combined in presets.

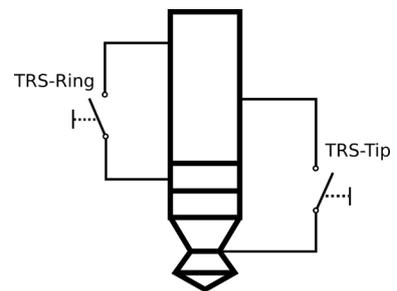


## 1.2 Overview



Garbage Collector Top View

- **TRS1/2:** Two 1/4 " stereo jack sockets. Sleeve is GND, Tip and Ring of the stereo jack are open and close to GND.
- **LED1/2:** Associated LEDs. The LEDs light up whenever the contact is closed. If the LED lights up green, tip is connected to GND, if it lights up red, the ring is connected to GND.
- **+9V:** Power supply 9-18V. 2.1mm barrel connector, center negative. This corresponds to the standard "Boss-Style" power supply. Current consumption maximum 32mA.
- **MIDI In/Thru:** 3.5 mm stereo jack sockets, assigned according to **MIDI TRS type A**.



Signal	Function	MIDI TRS Type A	5-Pin DIN
MIDI Ref	Current Source	Ring	Pin 4
MIDI Sig	Current Sink	Tip	Pin 5
GND	Shield	Sleeve	Pin2

## 2 MIDI Commands

The **Garbage Collector** is controlled by two groups of commands. General commands and line-specific commands. It tries to pack as much functionality as possible into as few commands as possible, so the command set is very extensive and some functions may occur twice.

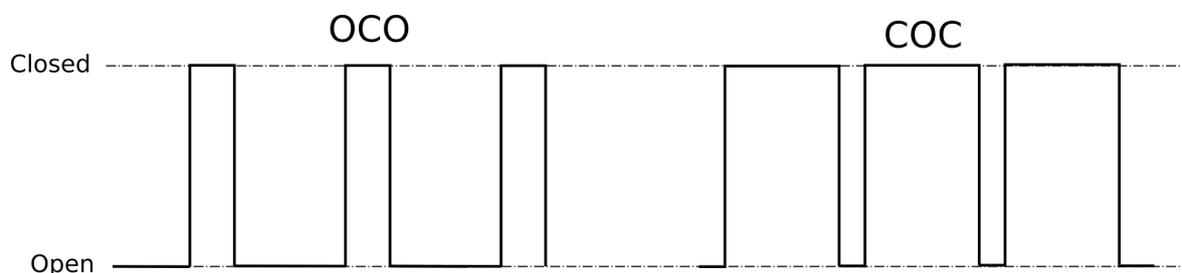
### 2.1 OCO vs COC

Most effects expect a switch that is open in the idle state and is activated by a connection to the sleeve (i.e. GND). But there are also manufacturers who, conversely, expect a closed switch for the idle state (e.g. Boss).

Commands that generate pulses are therefore available twice: *OCO* and *COC*. *OCO* means Open-Closed-Open (corresponds to *normally open*) and *COC* means Closed-Open-Closed (corresponds to *normally closed*).

**OCO:** The impulse always ends open. If the switch is already closed at the beginning, it is only opened

**COC:** The impulse always ends closed. If the switch is open at the beginning, it is only closed.



OCO vs COC

### 2.2 Switching of Multiple Lines

The commands *CC 00* to *CC 02* are used to switch several lines at the same time with a single command.

CC	#	TRS1-Tip	TRS1-Ring	TRS2-Tip	TRS2-Ring
00	00	Open	Open	Open	Open
00	01	Closed	Open	Open	Open
00	02	Open	Closed	Open	Open
00	03	Closed	Closed	Open	Open
00	04	Open	Open	Closed	Open
00	05	Closed	Open	Closed	Open
00	06	Open	Closed	Closed	Open
00	07	Closed	Closed	Closed	Open
00	08	Open	Open	Open	Closed
00	09	Closed	Open	Open	Closed
00	10	Open	Closed	Open	Closed
00	11	Closed	Closed	Open	Closed
00	12	Open	Open	Closed	Closed
00	13	Closed	Open	Closed	Closed
00	14	Open	Closed	Closed	Closed
00	15	Closed	Closed	Closed	Closed

CC	#	TRS1-Tip	TRS1-Ring
01	00	Open	Open
01	01	Closed	Open
01	02	Open	Closed
01	03	Closed	Closed
01	04	Pulse OCO	Pulse OCO
01	05	Pulse COC	Pulse COC

CC	#	TRS2-Tip	TRS2-Ring
02	00	Open	Open
02	01	Closed	Open
02	02	Open	Closed
02	03	Closed	Closed
02	04	Pulse OCO	Pulse OCO
02	05	Pulse COC	Pulse COC

## 2.3 Line-specific Commands

Each line has a set of identical commands. These commands start at *CC 10* and are each 10 apart from the next line. This means that e.g. command *CC 10* for TRS1-Tip and command *CC 20* for TRS1-Ring cover the same functions and have the same coding.

The following commands are the basic functions. The commands for the individual lines are as follows:

CC					Function				
TRS1-Tip	TRS1-Ring	TRS2-Tip	TRS2-Ring	#	Basic functions and OCO	#	COC	#	Toggle
10	20	30	40	00	Set „Open“				
				01	Set „Closed“				
				02	Single pulse OCO				
				03	Single pulse COC				
				10	Pulse OCO MIDI clock 1/4	30	Pulse COC MIDI clock 1/4	50	Toggle MIDI clock 1/4
				11	Pulse OCO MIDI clock 1/8	31	Pulse COC MIDI clock 1/8	51	Toggle MIDI clock 1/8
				12	Pulse OCO MIDI clock triplets	32	Pulse COC MIDI clock triplets	52	Toggle MIDI clock triplets
				13	Pulse OCO MIDI clock 1/16	33	Pulse COC MIDI clock 1/16	53	Toggle MIDI clock 1/16
				14	Pulse OCO MIDI clock dotted 1/8	34	Pulse COC MIDI clock dotted 1/8	54	Toggle MIDI clock dotted 1/8
				15	Pulse OCO MIDI clock 1/32	35	Pulse COC MIDI clock 1/32	55	Toggle MIDI clock 1/32
				16	Pulse OCO MIDI clock 1/2	36	Pulse COC MIDI clock 1/2	56	Toggle MIDI clock 1/2
				17	Pulse OCO MIDI clk every whole note	37	Pulse COC MIDI clk every whole note	57	Toggle MIDI clock every whole note
				18	Pulse OCO MIDI clk every 2nd whole n.	38	Pulse COC MIDI clk every 2nd whole n.	58	Toggle MIDI clock every 2nd note
				19	Pulse OCO MIDI clk every 3rd whole n.	39	Pulse COC MIDI clk every 3rd whole n.	59	Toggle MIDI clock every 3rd note
				20	Pulse OCO MIDI clk every 4th whole n.	40	Pulse COC MIDI clk every 4th whole n.	60	Toggle MIDI clock every 4th note
				21	Pulse OCO MIDI clk every 5th whole n.	41	Pulse COC MIDI clk every 5th whole n.	61	Toggle MIDI clock every 5th note
				22	Pulse OCO MIDI clk every 6th whole n.	42	Pulse COC MIDI clk every 6th whole n.	62	Toggle MIDI clock every 6th note
23	Pulse OCO MIDI clk every 7th whole n.	43	Pulse COC MIDI clk every 7th whole n.	63	Toggle MIDI clock every 7th note				
24	Pulse OCO MIDI clk every 8th whole n.	44	Pulse COC MIDI clk every 8th whole n.	64	Toggle MIDI clock every 8th note				

### 2.3.1 Pulse

It is also possible to send a certain number of pulses, e.g. to select a preset. This is also possible as OCO and COC.

CC					Funktion	
TRS1-Tip	TRS1-Ring	TRS2-Tip	TRS2-Ring	#	Funktion	
11	21	31	41	0	1 pulse OCO	
				1	2 pulse OCO	
				2	3 pulse OCO	
				n	n+1 pulse OCO	
				126	127 pulse OCO	
				127	128 pulse OCO	

CC					Funktion	
TRS1-Tip	TRS1-Ring	TRS2-Tip	TRS2-Ring	#	Funktion	
12	22	32	42	0	1 pulse COC	
				1	1 pulse COC	
				2	1 pulse COC	
				n	n+1 pulse COC	
				126	1 pulse COC	
				127	1 pulse COC	

### 2.3.2 MIDI Clock Pulse

Some Tap Tempo effects may react strangely when the Tap Tempo pulse is sent continuously. Therefore, it is possible to send only a limited number of pulses until the effect has recognized the beat. This is also possible as OCO and COC.

CC					Function
TRS1-Tip	TRS1-Ring	TRS2-Tip	TRS2-Ring	#	
13	23	33	43	0-19	1-20 pulses OCO MIDI clock 1/4
				20-39	1-20 pulses OCO MIDI clock 1/8
				40-59	1-20 pulses OCO MIDI clock triplets
				60-79	1-20 pulses OCO MIDI clock 1/16
				80-99	1-20 pulses OCO MIDI clock dotted 1/8
				100-119	1-20 pulses OCO MIDI clock 1/32

CC					Function
TRS1-Tip	TRS1-Ring	TRS2-Tip	TRS2-Ring	#	
14	24	34	44	0-19	1-20 pulses COC MIDI clock 1/4
				20-39	1-20 pulses COC MIDI clock 1/8
				40-59	1-20 pulses COC MIDI clock triplets
				60-79	1-20 pulses COC MIDI clock 1/16
				80-99	1-20 pulses COC MIDI clock dotted 1/8
				100-119	1-20 pulses COC MIDI clock 1/32

### 2.3.3 Pulse Length

The standard length of a pulse is approx. 80 ms. If this is too short for some devices, the pulse length can be set in 10 ms steps.

CC					Function
TRS1-Tip	TRS1-Ring	TRS2-Tip	TRS2-Ring	#	
15	25	35	45	n	Pulse length in steps of 10 ms

## 2.4 Presets

### 2.4.1 Saving

It is possible to save 16 configurations and recall them with Program Change (PC) commands. The last command that was called is saved for each line. The exception is the pulse length, which is always saved. With the command *CC 03*, TRS1 and TRS2 are saved together; with the commands *CC 04* and *CC 05*, TRS1 and TRS2 can be saved separately. The TRS that has not been saved is not changed when the preset is recalled.

CC		Function
03	0-15	Save the last commands from TRS1 and TRS2 to memory location 0-15
04	0-15	Save the last commands from TRS1 to memory location 0-15
05	0-15	Save the last commands from TRS2 to memory location 0-15

## 2.4.2 Recall

To recall the saved presets, the corresponding number is sent as a Program Change (PC).

**ATTENTION:** Preset no. 0 is the start state that is called up when the device is switched on.

## 2.4.3 Delete

CC		Function
06	0-15	Delete the corresponding preset

## 2.5 MIDI Channel

The **Garbage Collector**'s MIDI channel is adjustable. To change the MIDI channel, proceed as follows

1. Disconnect the device from the power supply
2. Remove the bottom plate. To do this, remove the 4 screws.
3. There is a button inside. Carefully press this button and restore the power supply while it is pressed. Be careful not to touch the electronics.
4. After the boot process is complete, the device starts to flash (LED1 green). Press the button according to the number of the desired channel (e.g. twice for channel 2). The **Garbage Collector** acknowledges this by emitting short flashing pulses corresponding to the number of the channel.
5. Once the desired channel is set, press the button and hold it down until the **Garbage Collector** switches off entirely.
6. Disconnect the supply voltage and mount the bottom plate. The next time it is started, the **Garbage Collector** reacts to the selected MIDI channel.

To put the **Garbage Collector** in omni mode (i.e. it responds to every channel) skip step 4.

## 2.6 Applications and Examples

### 2.6.1 Examples

Below are some simple examples.

With *CC 10 00* TRS1-Tip is opened, with *CC 10 01* it is closed.

With *CC 20 00* TRS1-Ring is opened, with *CC 20 01* it is closed.

With *CC 30 00* TRS2-Tip is opened, with *CC 30 01* it is closed.

With *CC 40 00* TRS2-Ring is opened, with *CC 40 01* it is closed.

For example, to pulse TRS2-Tip COC in 1/8 MIDI clock, the following is sent: *CC 30 31*

### 2.6.2 DigiTech FS 3X

To emulate a DigiTech FS 3X switch, the following commands are sent (for TRS1)

Function FS 3X	Function TRS	CC Commandos	Description
Mode	Tip to GND	CC 10 02	A single pulse on the tip emulates a non-latching button press on Mode
Down	Ring to GND	CC 20 02	A single pulse on the tip emulates a non-latching button press on Down
Up	Tip and Ring to GND	CC 10 02 + CC 20 02	A single pulse on the tip emulates a non-latching button press on Up

### 2.6.3 DigiTech DOD Rubberneck

The foot switch input of the Rubberneck is matched to the above FS 3X switch.

Function	Function FS 3X	CC Commandos	Description
Modulation on/off	Button Down pressed	CC 20 02	A single pulse on the ring toggles the modulation
Rubbernecking	Button Up press and hold	CC 10 01 activate, CC 10 00 deactivate	Closed state activates Rubbernecking, Open state deactivates
Tap Tempo	Button Up tapping	CC 10 02 + CC 20 02 or CC 01 04	Single pulse activates tap tempo
Tap Tempo with MIDI clock	Button Up tapping	CC 10 10 + CC 20 10	Every 1/4 note MIDI clock a pulse on tip and ring is triggered

### 2.6.4 Strymon El Capistan

The Strymon El Capistan has the option of calling up the favorites setting via the EXP socket

Function El Capistan	Function TRS	CC Commandos	Description
Recall Favorite setting	Tip Closed	CC 10 01	A closed line at the tip calls up the favorites setting
Back to Live Mode	Tip Open	CC 10 00	An open line at the tip changes back to live mode

### 2.6.5 Walrus Monument

The Walrus Monument tremolo has a foot switch input for the tap tempo.

Function Monument	Function TRS	CC Commandos	Description
Tap Tempo	Pulse OCO at Tip	CC 10 02	Repeating pulses on the tip synchronize with the tap tempo
Tap Tempo with MIDI Clock	Pulse OCO at Tip with MIDI Clock 1/4 note	CC 10 10	Repeating MIDI clock 1/4 note pulses on the tip synchronize with the tap tempo