

MIDI Controls

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Overview of MIDI

What is MIDI Sync?

MIDI (short for Musical Instrument Digital Interface) is the digital language that musical equipment use to talk to one another. This section is about using MIDI Commands in order to allow your BeatBuddy to talk to other devices which allows for other devices to control your BeatBuddy (BeatBuddy is called "**Slave**") and for your BeatBuddy to control other devices (BeatBuddy is called "**Master**"), making it a very powerful tool for live performance and recording.

How do I connect my BeatBuddy with MIDI?

On the output side of the BeatBuddy there is a "MIDI Sync" port. In order to keep the BeatBuddy in a compact single pedal format while still accommodating both IN and OUT MIDI, a special [MIDI Sync breakout cable](#) (sold separately) is required to convert the BeatBuddy's PS/2 MIDI Sync port into 2 standard full size 5-pin MIDI ports for MIDI IN and MIDI OUT. You will still need a normal 5-pin MIDI cable to connect the MIDI Sync Cable to your other MIDI device.

When BeatBuddy is Master: Connect the BeatBuddy's MIDI Sync OUT to the other device's IN port.

When BeatBuddy is Slave: Connect the BeatBuddy's MIDI Sync IN to the other device's OUT port.

What can I use MIDI for?

BeatBuddy is "Master" (MIDI OUT):

1. Sync your looper to the BeatBuddy:

MIDI Sync is a powerful tool to integrate the BeatBuddy with your other MIDI enabled devices, such as MIDI Sync enabled loopers and effects, to create a powerful performance or recording system.

For example, when the BeatBuddy is synced with a MIDI Sync enabled looper (such as the Ditto X4, Pigtronix Infinity, Boomerang III, TC-Helicon VoiceLive 3 or Boss RC-300 -- most other loopers do not have MIDI Sync capabilities), the looper can complete the loops exactly on the beat, so that the recorded loop stays in sync with the drums. If you use a looper without MIDI sync with the BeatBuddy, you will most likely make the guitar loop a little bit longer or shorter than the drum loop and they will become out of sync. The BeatBuddy also sends out Start and Stop commands so that the looper start and stops at the same time the BeatBuddy does (though not all loopers follow these commands, some just work with the sync). You have full control of which commands BeatBuddy sends and reacts to in the MIDI settings, as explained below.

Pause during MIDI Sync

When using MIDI Sync, BeatBuddy's pause feature can operate in two modes:

Normal Pause: When the BeatBuddy is paused, MIDI Stop command is sent by the BeatBuddy to stop all synced devices. When unpaused, MIDI Start is sent to restart all synced devices. The beat is restarted at the beginning of the measure to keep in time with other devices. This behavior is more appropriate when BeatBuddy is acting as Master in MIDI Sync.

Mute Pause - When the BeatBuddy is paused, no MIDI control commands are sent to other devices, allowing them to effectively continue playing, while BeatBuddy only mutes its own sound, and

continues playing the beat in time. When unpaused, the BeatBuddy unmutes and continues playing drums. This behaviour is recommended when the BeatBuddy is acting as Slave in MIDI Sync.

Mute pause can be set at **Settings > Main Pedal > Mute Pause**

2. Sync effects to the BeatBuddy's drums:

Some effects can be timed to the BeatBuddy's tempo. For example, if a MIDI Sync enabled delay effect is used, it will time the length of the delay to the speed of the beat, so it sounds perfectly in sync with the drums. Some excellent MIDI sync capable effects are provided by the Eventide H9 and TC-Helicon VoiceLive 3.

3. Record your BeatBuddy's MIDI notes in your DAW:

The BeatBuddy has the capability to stream out the MIDI notes it is playing. You can connect the BeatBuddy to your computer to record the MIDI notes as the BeatBuddy is playing, so you can have the ease of playing the BeatBuddy to lay down the beat, but also keep the powerful capabilities of working with MIDI notes.

BeatBuddy is "Slave" (MIDI IN):

1. **Quick song selection:** You have 3,000 songs in your repertoire and you play gigs where you get random song requests from the audience. Though you have already figured out which BeatBuddy beats go with which songs in your repertoire (or used our handy [Song Matching Tool](#)), you don't want to have to search through all of the BeatBuddy's folders for the right beat when you get a song request. With MIDI, you can use

an iPad app such as Onsong, which has your song database of lyrics and chord charts so that when you pull up the chord chart to a song on Onsong, it will change to a certain BeatBuddy song which matches it.

2. Additional control with external MIDI footswitch. Some users want a footswitch for every function (drum fill, transition, outro, tap tempo, etc.). So we have created a special 'CC' MIDI command for practically every function the BeatBuddy has, so you can control the BeatBuddy from another device.

3. Trigger the BeatBuddy's super awesome drum sounds with an electronic drum set: So you have a cheap electronic drum set and you hate the way it sounds. You can connect the MIDI OUT from the drum set to the MIDI IN on the BeatBuddy and when you play on the electronic drum set, it will play the BeatBuddy's award winning super high quality sounds! This is also useful when you're composing beats in your DAW and want to test how they will sound on the BeatBuddy -- no need to load the MIDI files to into the BeatBuddy -- just stream the MIDI notes!

MIDI Settings

MIDI-IN

These settings control what the BeatBuddy does when it receives MIDI commands from an external device.

Channel (1-16)

- [1-16]: Sets which channel the MIDI commands are received from. It's important that the BeatBuddy is receiving MIDI commands on the same channel that your external device is sending them.
- All (Omni): This mode can be chosen if you want to receive MIDI messages on all the possible channels.

Sync

- Enable: The BeatBuddy sets its own tempo based on the tempo (MIDI Clock) that it receives.
- Disable: BeatBuddy ignores any tempo sent to it.

Start

- Enable: BeatBuddy starts playing upon receiving the Start MIDI command from an external device.
- Disable: BeatBuddy ignores all Start commands it receives.

Stop

- Enable: BeatBuddy stops playing upon receiving the Stop MIDI command from an external device.
- Disable: BeatBuddy ignores all Stop commands it receives.

Note On

- **Enable:** When the BeatBuddy receives MIDI notes, it will play the corresponding sounds on the BeatBuddy drum sets. This is very useful if you want to play an electronic drum set but hear the high quality BeatBuddy sounds. Connect the electronic drum set's MIDI OUT to the BeatBuddy's MIDI-IN and as you play on the electronic drum set, the BeatBuddy will produce its famous award winning sound to your playing!
- **Disable:** BeatBuddy ignores all MIDI notes it receives.

Note Off

- **Enable:** When the BeatBuddy receives the MIDI note off command, it will stop playing the sound in the drum set that corresponds with that note. This is used mostly for long note sounds, such as bass or piano in custom made drum sets that include these instrument sounds. However, this sometimes can cause issues with sound playback, depending on the type of device that is used. So unless you have a drum set with other instrument sounds other than drums, it's best to leave this disabled.
- **Disable:** BeatBuddy ignores all note off commands it receives.

Tempo (MSB:106 LSB:107)

- **Enable:** You can control the tempo of the Beatbuddy using MIDI MSB/LSB system as well as using the MIDI INC/DEC messages. For more details regarding this, See Below [LINK to tempo section]
- **Disable:** BeatBuddy ignores all Tempo change commands it receives

Mix-Vol (CC-108)

- **Enable:** Mixer volume (main volume knob that controls only the drum sound volume) can be controlled by sending the MIDI message with a value ranging from 0 to 100.

- **Disable:** BeatBuddy ignores all mixer volume commands it receives.

HP-Vol (CC-109)

- **Enable:** Headphone volume can be controlled by sending the MIDI message with a value ranging from 0 to 100.
- **Disable:** BeatBuddy ignores all mixer volume commands it receives.

Accent-Hit (CC-110)

- **Enable:** The Beatbuddy will play the current song part accent hit each time it receives the Accent-Hit MIDI message. You can control the volume of the accent hit by changing the value of the message ranging from 0 to 127.
- **Disable:** BeatBuddy ignores all Accent-Hit commands it receives.

Pause/Unpause (CC-111)

- **Enable:** The BeatBuddy will Pause the current song when a Pause/Unpause message is received. The second time this message is received, the Beatbuddy will unpause the current song.
- **Disable:** The BeatBuddy ignores all Pause/Unpause commands it receives

Drum Fill (CC-112)

- **Enable:** The BeatBuddy will trigger a drum-fill when a Drum Fill message is received.
- **Disable:** The BeatBuddy ignores all Drum Fill message it receives.

Transition (CC-113)

- **Enable:** The BeatBuddy will triggers a transition when a custom transition message is received. You can select which part to go after the transition by setting the value of the command to the index of the part you want to jump. The transition will continue playing in a loop until the value is changed to 0.
 - Value 1 → Part 1
 - Value 2 → Part 2
 - Value 3 → Part 3
 - Value 127 → Next Part
 - Value 0 → BeatBuddy ends transition and goes to the selected song part as specified in the original value, as specified above.
- **Disable:** The BeatBuddy ignores all Transition Fill message it receives.

Outro (CC-115)

- **Enable:** The BeatBuddy will trigger the outro of the song when a Outro message is received.
- **Disable:** The BeatBuddy ignores all Outro message it receives.

Tap-Tempo (CC-117)

- **Enable:** When the BeatBuddy receives the CC-117 MIDI command, it enters Tap Tempo mode. This is a useful way to enter Tap Tempo mode hands free if you have an external device that can send this command (such as the Guitar Wing). Sending out the CC-117 MIDI command multiple times is like tapping out the tempo with the pedal.
- **Disable:** BeatBuddy ignores all CC-117 commands it receives.

MIDI-OUT

Output Type

- **MIDI-OUT:** BeatBuddy ignores all incoming MIDI messages sent to the BeatBuddy's MIDI-IN port and just sends out BeatBuddy generated MIDI commands through the MIDI-OUT port.
- **MIDI-MERGE:** BeatBuddy combines any MIDI commands it receives in the MIDI-IN port with its own generated commands and sends both commands to the MIDI-OUT port.
- **MIDI-THRU:** BeatBuddy only sends out MIDI commands that it has received through the MIDI-IN port.

Channel (1-16)

- [1-16]: Sets on which channel the MIDI commands are sent out to. It's important that the BeatBuddy is sending out MIDI commands on the same channel that your external device is receiving them.

Sync

- **Always On:** BeatBuddy always sends out the MIDI tempo clock even when it is not playing. This is useful for when you want your MIDI tempo based devices such as loopers or delay, to play to a certain tempo but you don't want to have drums playing while you do it.
- **While Playing:** BeatBuddy only sends out MIDI tempo clock while it is playing drums. This is good for when you want your other devices to only follow the BeatBuddy's tempo while the drums are playing.
- **Disable:** BeatBuddy never sends out MIDI tempo clock.

Start

- **Intro:** BeatBuddy sends out the MIDI Start command at the beginning of the intro. Please note that if the intro is less than a full bar long, this setting may confuse your other devices and cause them to play out of time.
- **Main Beat:** BeatBuddy sends out the MIDI Start command when the main beat starts playing after the intro has finished.
- **Disable:** BeatBuddy never sends out the MIDI Start command.

Stop

- **Pause Only:** BeatBuddy sends out the MIDI Stop command when BeatBuddy has been paused.
- **Pause and End:** BeatBuddy sends out the MIDI Stop command when BeatBuddy has been paused and when the outro ends.
- **End Only:** BeatBuddy sends out the MIDI Stop command only when the outro ends.
- **Disable:** BeatBuddy never sends out the MIDI Stop command.

Notes

- **Enable:** BeatBuddy sends out the MIDI notes that it is currently playing. This can trigger sounds in another device such as your computer or another synthesizer.
- **Disable:** BeatBuddy does not send out any MIDI notes. Some devices (such as the Pigtronic Infinity looper) get confused and do not operate properly when they receive MIDI notes.

Next Part (CC102)

- **Enable:** BeatBuddy sends out the CC102 MIDI command when the transition has completed and the next part starts.

- **Disable:** BeatBuddy does not send out the CC102 command. Some devices (such as the Eventide Timeline) get confused when they receive this command and do not operate properly.

Time Signature

- **Enable:** BeatBuddy sends out Time Signature information. This is useful for some devices (such as the Pigtronix Infinity Looper) so that they can play in time with the BeatBuddy even as the time signature changes.
- **Disable:** BeatBuddy does not send out the Time Signature information. Some devices get confused and don't operate properly when they receive this signal.

Folder/Song Select

You can select a BeatBuddy folder and song with the MIDI Bank Select and Program Change messages. The folder is selected with the Bank Select Message (Bank MSB and LSB) and the song is selected with the Program change. Each of the 128 values of Bank MSB value can have 128 folders as selected by the value of Bank LSB. This gives a potential of $128 \text{ MSB} \times 128 \text{ LSB} = 16,384$ different folders with 128 songs each.

The order of the folders / songs are sorted by the BeatBuddy Manager. The order of the folders / songs corresponds to the number used by the MIDI messages +1. This means that Program Change Message must have a value of 0 to play the first song in the menu. We know this is confusing -- but MIDI was designed by computer nerds, not normal people like us, and computer nerds like to start with 0 instead of 1.

Example:

Folder/Song	BANK MSB (CC-0)	BANK LSB (CC-32)	Program Change
Folder 1 - Song 1	0	0	0
Folder 1 - Song 2	0	0	1
Folder 3 - Song 3	0	2	2
Folder 129 - Song 4	1	1	3

Please note that the BeatBuddy's song does not change until the Program Change message is received, i.e. bank messages alone are not enough to change a program.

Tempo control

Since the BeatBuddy's tempo ranges from 40BPM - 300BPM, we can't use just one CC command to cover the whole range because a CC command can only have 128 values. There are two ways of changing the tempo. With INC/DEC (increase/decrease) messages which adjust the tempo up or down by 1 BPM, or by skipping directly to a specific tempo BPM using the MSB/LSB system, like in the Song Selection system (Program Change). However, it's a bit more complicated because unlike the Song Selection system where you have dedicated CC commands to represent the MSB (CC-0) and LSB (CC-32), there is no dedicated CC commands for Tempo. So we use the "NRPN Register" (Non-Registered Parameter Number) which is a general purpose MSB (CC-99) and LSB (CC-98) that can be used to control tempo or any other parameter, or multiple parameters at once. Currently we're only using it to control tempo, but we follow the MIDI Standard protocol to leave room for further control in the future. Because of this capability for multiple parameter control, the steps below are followed.

INC/DEC (see. <https://www.midi.org/specifications>)

Here are the common steps to do to control the BeatBuddy's tempo. It follows the Data INC/DEC specification of the MIDI protocol:

Step to increment tempo

Step s	Message	Details
1*	CC-99 / 106	Set the NRPN MSB register to Tempo MSB
2*	CC-98 / 107	Set the NRPN LSB register to Tempo LSB
3	CC-96 / 1	Increment the tempo by one
4*	CC-99 / 127	Clear the NRPN MSB register

5*	CC-98 / 127	Clears the NRPN LSB register
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Step to decrement tempo

Step	Message	Details
1*	CC-99 / 106	Set the NRPN MSB register to Tempo MSB
2*	CC-98 / 107	Set the NRPN LSB register to Tempo LSB
3	CC-97 / 1	Decrement the tempo by one
4*	CC-99 / 127	Clear the NRPN MSB register
5*	CC-98 / 127	Clears the NRPN LSB register

Steps with a * are optional if the only value control by Inc/Dec is the Tempo. By default, the Beatbuddy will increment / decrement the tempo when receiving a INC/DEC message.

Tempo MSB & Tempo LSB

To directly set the tempo to a specific BPM, we need to use the Tempo MSB and Tempo LSB. The Beatbuddy will update its current tempo only when receiving the LSB message. So the order of the message should be:

1. MSB value
2. LSB value

Don't forget, the value of the Tempo can only be set with both MSB (CC-106) and LSB (CC-107).

Here are a few examples of Midi message combination.

MSB (CC-106)	LSB (CC-107)	Tempo
0	25	40
0	40	40
0	127	127
1	0	128
1	25	153
1	50	178
2	0	256
2	44	300
2	45	300

MIDI Commands

Program Change (CC) summary

CC Number	Value	Action
CC-0	[0-127]	Bank (Song folder) Select MSB
CC-32	[0-127]	Bank (Song folder) Select LSB
CC-96	[1-127]	Data increment (+1) – INC
CC-97	[1-127]	Data decrement (-1) – DEC

CC-98	[0-127]	NRPN_LSB
CC-99	[0-127]	NRPN_MSB
CC-106	[0-127]	Tempo MSB
CC-107	[0-127]	Tempo LSB
CC-108	[0-100]	Change the Mixer Volume (Main Volume knob)
CC-109	[0-100]	Change the Headphone Volume
CC-110	[0-127]	Triggers an accent hit with a volume from the value 0 (mute) to 100 (original recorded volume) to 127 (amplified more than the original recorded volume)
CC-111	[1-127]	Pause / Unpause the current song
CC-112	[1-127]	Triggers a drum fill
CC-113	[1-127]	<p>Starts song transition (Selects the next part)</p> <p>1: Starts transition, will jump to Part 1 on exit</p> <p>2: Starts transition, will jump to Part 2 on exit</p> <p>3: Starts transition, will jump to Part 3 on exit</p> <p>127: Starts transition, will jump to next part on exit</p> <p>Transition will continue looping until value is changed to 0.</p>

		It is possible to start a song with a transition.
	0	Quits the transition and go to specified part
CC-114	>0	Starts the playback of the current song
CC-115	[1-127]	Triggers the outro of the song
CC-116	[1-127]	Selects a specific drumset
CC-117	Not used	Enters Tap Tempo mode and generate Tap Event