

MIDISID



Physical Control Surface

<https://peacockmedia.software/midisid>



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Introduction

Thank you for your interest in the MIDISID Physical Control Surface. As its name suggests, it provides physical controls for MIDISID. It obviously requires a MIDISID.

MIDISID contains two modern SID replacements and responds to MIDI.

It achieves a dream I'd long held: multiple SIDs in a small device which can be driven by any MIDI input, or play a .mid file, with multiple controls for the SID's parameters - ADSR, filter PWM and so on.

MIDISID achieves this but sound design can be clumsy, particularly the advanced features such as ring modulation, because of having to navigate the menu for different parameters.

The control surface addresses this. The idea was to have analogue pots and sliders laid out Minimoog-style. With this in mind, MIDISID has long supported external control via CC messages. What's held me back is the cost of building such a control panel in materials and time.

But here we are, and the response has been better than I'd dared hope.

The control surface works with all MIDISIDs but there is a minimum version of the MIDISID firmware that you'll need for full support of the control surface:

For all MIDISIDs before v4 'Morpheus': (which have the smaller 2-row screen)
at least version 2.5.0
current version: <https://peacockmedia.software/midisid/siddriver252.uf2>

For MIDISID 'Morpheus': (which has the taller 4-row screen)
at least version 4.5.0
current version: <https://peacockmedia.software/midisid/siddriver452.uf2>

These firmware updates are for your MIDISID, not the control panel. You can see the version that you currently have on the screen briefly at power-up. For update instructions, see your MIDISID manual.

~ Shiela

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Powering the control surface

The surface requires 5V - power it using the USB-C socket on the back.

Since the pots and sliders are physical and analogue (and not motorised) and because communication is one-way, the surface can't update itself to reflect the pre-existing state of the MIDISID.

Therefore, the surface will send MIDISID its settings on power-up and whenever the mode is changed (MIDISID resets to some extent when the mode is changed anyway).

So try to power MIDISID first, then the surface.

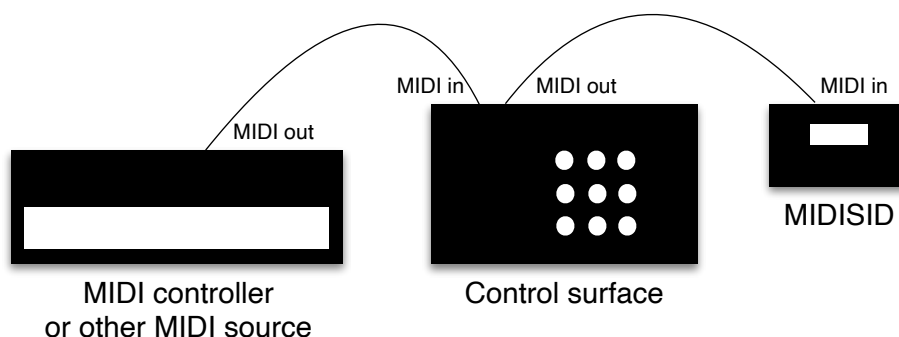
If this isn't possible or if you power-cycle or reset the MIDISID, then change the mode on the surface to bring MIDISID up-to-date. If the surface is already on the mode that you want, simply press the button five times to cycle the mode back to the one you want.

Connecting the control surface

The control surface has three sockets at the rear:

- a standard MIDI 5-pin DIN for midi in. Generally with 5-pin DINs, the 'MIDI out' of one thing connects to the 'MIDI in' of another.
- a standard MIDI 5-pin DIN for midi out. The surface passes MIDI messages through from midi in and adds control messages which are the result of you turning knobs or pressing buttons. (It will filter out messages that may interfere with the surface's settings, unless it's in bypass mode.)
- a USB-C socket. Used for power as well as updating the firmware. (see [Updating the firmware](#)) and powering the device See ([Powering the control surface](#))

Both the control surface and MIDISID use standard 5-pin DIN MIDI sockets, so use a standard MIDI cable to connect the control surface's MIDI out to MIDISID's MIDI in, and plug the MIDI source (that you would usually plug into MIDISID) into the surface's MIDI in.



At this point, the control surface doesn't accept MIDI over USB. If your controller has a standard MIDI out port, again use a standard MIDI lead.

If it has TRS MIDI, use a suitable adaptor to adapt that to standard MIDI (beware of different TRS pin configurations. Type 'A' is most popular but not universal). If you have MIDI out over USB (eg from a computer) then use a suitable USB-MIDI adaptor.

Controls

These should be self-explanatory, but some labels are abbreviations.

Mode: Press the button to cycle through MIDISID's modes, which are described in more detail below. Poly, Mono and Duo modes work best with the control surface.

When no mode LEDs are lit, the control surface is in 'bypass' mode, passing the MIDI through, but adding no control information. This is to allow you to recall patches or do other work directly on the MIDISID without interference from the surface.

Filter: Press the button to cycle through the filter types (or none). With this active, the two knobs above control:

FCO: filter cut off

Res: filter resonance

Sweep: When the filter is active, press the button to switch on filter sweep. With this active, the knobs above control:

Sweep start: the filter cutoff for the start of the sweep

Speed: the speed of the sweep

Sweep end: the filter cutoff for the end of the sweep

Multiple Notes: Press the button to cycle through the options. These determine what happens when one or more new notes are received before the previous one has finished.

- Port: Portamento or glide from the old note to the new one
- Arp: Arpeggiation - MIDISID will rapidly switch between the held notes, giving the impression of a chord. This is a characteristic 8-bit sound-chip sound.
- Replace: The new note replaces the old one
- Ignore: The new note is ignored and the old one held

Speed: When Portamento or Arpeggiation are selected, this controls the speed

Each of the three voices:

Waveform buttons: Press one or more to select the waveform or combination to be used for that voice. Triangle, square/pulse, sawtooth, noise.

PW: if square is selected, this controls the pulse width or duty cycle.

PWM: These two knobs control the depth and speed of pulse width modulation. Turn depth all the way to the left for no modulation.

ADSR: These four sliders set the envelope for the note, attack, decay, sustain release.

Vib: If in Polyphonic mode, These two knobs control the depth and speed of the vibrato. Turn depth fully left for no vibrato. The centre detent is irrelevant in this case

Detune: If in Monophonic mode, these knobs control the detuning of the particular voice. This can be used for chorus effects, or to create a frequency offset for ring modulation. (This is currently shown as 'tuning' on the MIDISID.)

Sync / Ring: When in mono or duo modes, these buttons switch these effects on or off. Note that each voice can be sync'd or ring modulated with one other voice.

Voice 3 Mute: When using the effects above, it may be desirable to only use the two voices that are being ring modulated or sync'd.

MIDISID modes

This is a brief description of the modes. For more information see your MIDISID manual.

General MIDI mode

Each MIDI channel is assigned to voice. So on a 2-SID MIDISID, channels 1-6 are mapped to voices 1-6.

One special case - if a note is detected on channel 10 (traditionally percussion). Then channel 10 is assigned to voice 6, with channels 1-5 mapped to voices 1-5. This mapping persists until the next power-on.

This mode is most suitable for streaming a .mid file or MIDI from a DAW that uses multiple channels and program change messages to select from presets, perhaps not most well-aligned to the functionality of the control surface.

However, in this mode, the 'voice' strips on the control surface for voice 1, 2 and 3 will control the settings for the corresponding voice on MIDISID, which in turn respond to MIDI channel 1, 2 and 3. So if your setup is able to send different things on the first three channels, and maybe percussion on channel 10, you can have control over the settings for three voices at once.

Sync and ring are disabled, the filter and 'multiple notes' will work but will apply to everything.

Polyphonic mode

Since one patch is applied to all voices, and a single voice is used for each note played, voices 2 and 3 on the control surface will be disabled, along with the sync/ring buttons.

This mode is (counterintuitively) best with MIDISID's physical switch set to 'mono'

Monophonic mode

Mono and Duo modes are where the control surface really comes into its own. A patch uses all three voices on both chips. All are used for a note, giving a stereo output with 3 voices heard on both channels. Because 6 voices are heard but unlikely to be in sync, the sound will be rich and full. (the sync setting changes this somewhat, making a purer sound with more volume.) This chorus effect can be enhanced by adjusting the tuning of each voice very slightly. Some patches, eg Honky Tonk, use this for effect. Only one note can be played at a time. This mode can make use of ring modulation and/or waveform sync. Arpeggiation and portamento are possible.

This mode is (counterintuitively) best with the physical switch set to 'stereo'

Duophonic mode

As with Mono mode, a patch uses three voices and the same patch is applied to both chips. But a note is played using the three voices of one chip, so a note on any channel is assigned to the next free chip for two-note polyphony. This mode can make use of ring modulation and/or waveform sync but because of this polyphony, arpeggiation and portamento aren't possible.

This mode is best with the physical switch set to 'mono'

Filter

Each SID has a single filter. At present, in Mono and Duo modes, it applies to all voices.

The sweep is a function of MIDISID, which resets the filter cutoff to the FCO / sweep start value at the start of a note and sweeps it to the end value at a speed you set. (On MIDISID, the speed currently has five steps).

The sweep is obviously disabled when the filter is off.

Multiple notes

This setting allows you to choose what happens in monophonic modes (mono/GM) when a new note starts before the previous one finishes.

Replace will force the old one to finish and start the new one. Ignore will... ignore the new one and hold the old one until released by the user.

Portamento will replace the note, but glide to it at the preset speed.

Arpeggiation allows you to play a chord and hear all the notes, rapidly switched. This is a classic sound for 8-bit sound chips.

Obviously, portamento and arpeggiation can't apply in polyphonic modes (Poly and Duo)

Pulse Width / PWM

The pulse width only applies when you have square wave selected. This changes the sound from thin to fat (and the apparent volume from low to high).

it's possible to sweep this manually using the PW pot. But if you raise the 'PWM Depth', MIDISID will modulate the pulse width at a speed set by PWM speed (this is analogous to feeding an LFO to the pulse width). This adds interest to the sound and is another classic SID characteristic (few 8-bit sound chips had variable pulse width).

When the PWM is actively modulating, the adjacent LED will be lit. To stop PWM, turn the pot to the far left and the LED will go out.

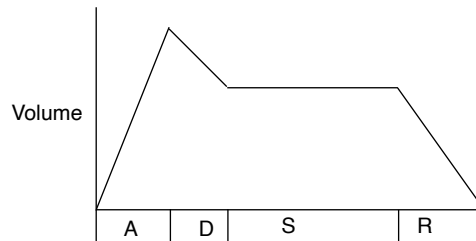
Waveforms

Since the SID does allow multiple waveforms to be selected for the same voice, the control surface has a button for each. It will allow you to select combinations that probably don't work on your SIDs although this may depend on which SID you're using. MIDISID's own controls only allow you to select the combinations that are known to work. The surface will allow any combination of two voices but you may hear nothing with some combinations. (You'll probably find that noise with anything else doesn't work.) Combinations of three or four waveforms can't be selected on the surface or the MIDISID.

Of course, in Mono and Duo mode, you can combine waveforms by selecting a different one for each voice.

Envelope / ADSR

The SID has an envelope generator for each voice, triggered when a note is gated (MIDI note on).



Attack is the rate that the volume rises from nothing to full volume. Fast attacks are like plucking, slow like bowing.

Decay is the rate that the volume then falls to the sustain level

If Sustain and Release are both zero, then you can create 'one shot' sounds, like a xylophone or drum that will always fall to nothing by itself.

Sustain is the level that the note settles at and will remain at until the note is released. (MIDI note off)

Release is the rate that the volume falls after the note-off

Vibrato

These controls set vibrato (pitch is modulated, analogous to feeding an LFO to the frequency).

Vibrato is only used in Poly mode where detuning isn't relevant (detuning sets the relative tuning of the voices and the same patch is used for all voices in poly mode. If it's necessary to tune MIDISID to an instrument, then it has a global tuning setting which is distinct from the voice detuning controls. Press and hold button 3 on MIDISID while pressing and releasing button 4 to access that.)

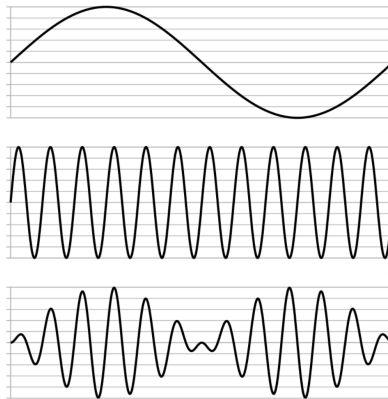
Detune

When in Mono or Duo mode, the Detune controls can be used to great effect. Slightly detuning two of the voices adds chorus, making the sound fuller and more interesting. A little more detuning on two of the voices gives a 'honky tonk' effect (piano in need of tuning) or other crazy effects and 'combination tones'. Pulling a voice up or down by an octave (full travel of the coarse control either way) gives an organ-like effect. You can get other intervals such as third and fifth when in monophonic mode.

It's needed for ring modulation where two different frequencies are needed.

Ring modulation

Ring modulation is a kind of amplitude modulation where two frequencies are combined to produce an effect.



(Image CC BY-SA 4.0 Hyacinth)

The shapes of each signal, the difference in frequency and whether or not they are harmonically-related will all affect the effect.

You can use ring modulation with the monophonic and duophonic modes because they use multiple voices for the same note.

You can switch on ring modulation on for one or more voices.

If you switch on ring modulation for voice 1, it will be modulated with voice 3

If you switch on ring modulation for voice 2, it will be modulated with voice 1

If you switch on ring modulation for voice 3, it will be modulated with voice 2

You will need to set an offset for the 'modulated with' voice with the Detune controls. As you alter the tuning for the second voice, you should hear the effect, which should sound different to the simple 'detuning' that you'd normally get with a tuning offset.

To further alter the sound, play with the waveform of your two voices. To get a cleaner ring modulation sound (ie without the third voice producing a tone) you can mute voice 3. See below.

Tips:

When playing with the ring modulation, filtering can mask the modulation effect.

When adjusting settings, try notes in all the octaves. Settings that sound boring in one octave may sound spectacular when played in a different octave.

Muting voice 3

This is a feature of the SID chip which is useful if you're using ring modulation, or just wish to build sounds using two voices rather than three.

Once again this is a feature of monophonic / duophonic modes.

Saving and using your sounds

Since the controls are physical and the pots analogue, it's not possible to recall a patch to the control surface other than manually. (Buttons will remember their state through power-cycle.)

However, if you find a sound that you want to keep you can of course hit the fourth button on MIDISID and save the patch to one of the 64 memory slots for later retrieval. Patches are automatically saved as Poly, Mono or Duo, depending on the mode you're in.

As from version XX of the MIDISID firmware, it's easier to use your patches in your music, since they can now be selected by CC. The switch to allow program change messages to select from user patches is CC zero, which is bank select, MSB.

This won't be possible with the control surface active, since it deliberately doesn't pass program change messages through. So you'll need to take that out of the loop or put it into bypass mode.

There is a lot to say about selecting user patches by CC (translates as 'many ways to fail'). See Appendix F in the up-to-date MIDISID manual for details. (In short, try to select CC zero rather than using bank select. For built-in presets, send 0 or 1, whichever is the lowest value you can select, and for user slots, send the highest value you can.)

Duo and Mono are the same as far as patches are concerned and interchangeable, but if selecting manually, MIDISID's current mode will be changed to match the mode the patch was saved in. You'll be unable to save a patch when in GM mode, but you can select a poly patch by CC when in GM mode and it'll be applied to the SID voice matching the channel that you send the CC / Program change messages on.

Updating the firmware

When updates are available, it's easy to update the firmware.

With MIDISID powered off, use a USB cable* to connect MIDISID to a computer, using the USB C connector. Give a double-tap on the reset button. (The speed of the double-tap is important, deliberate and not too fast and not too slow.) This should put MIDISID into boot mode.

Alternatively, press and hold the BOOT button, a smaller oval button on the underside close to the USB-C socket (early boards have this button marked SW204). Keep it pressed while pressing and releasing the 'Reset' button then release the smaller button

Then you should see the surface on your computer as a storage device with a name like "RPI-RP2". Simply drag the new firmware (.uf2 file) onto the device's icon. If successful, it should unmount itself from your computer and the firmware should start. The surface may be operational at this point but for reasons I don't know, sometimes it locks up after updating and requires powering down and back up.

* This cable needs to carry data. Some cables appear to be charge-only. If you have trouble, try another cable

Troubleshooting

Reset messages

One 'Gotcha' to bear in mind is that devices or your DAW may send reset messages. For example when you press a 'reset' button on your keyboard or when you start or stop music on your DAW.

MIDISID doesn't currently respond to a 'reset all controllers' message (if/when it does, it would probably make sense for the control surface to filter it out.) Most of the usual reset messages (modwheel, sustain, pitch bend etc) won't interfere with the settings relevant to the control surface but it's possible that something may send a reset message or reset a controller that interferes with MIDISID's current settings.

For this reason, the surface will filter out all program change messages, unless it's in bypass mode (no mode LED lit).

Appendices

Appendix A

Appendix B

Appendix C

The list of General MIDI instruments

Piano

- 1 Acoustic Grand Piano
- 2 Bright Acoustic Piano
- 3 Electric Grand Piano
- 4 Honky-tonk Piano
- 5 Electric Piano 1 (usually a Rhodes Piano)
- 6 Electric Piano 2 (usually an FM piano patch)
- 7 Harpsichord
- 8 Clavinet

Chromatic Percussion

- 9 Celesta
- 10 Glockenspiel
- 11 Music Box
- 12 Vibraphone
- 13 Marimba
- 14 Xylophone
- 15 Tubular Bells
- 16 Dulcimer

Organ

- 17 Drawbar Organ
- 18 Percussive Organ
- 19 Rock Organ
- 20 Church Organ
- 21 Reed Organ
- 22 Accordion
- 23 Harmonica
- 24 Tango Accordion

Guitar

- 25 Acoustic Guitar (nylon)
- 26 Acoustic Guitar (steel)
- 27 Electric Guitar (jazz)
- 28 Electric Guitar (clean)
- 29 Electric Guitar (muted)
- 30 Electric Guitar (overdriven)
- 31 Electric Guitar (distortion)
- 32 Electric Guitar (harmonics)

Bass

- 33 Acoustic Bass
- 34 Electric Bass (finger)
- 35 Electric Bass (picked)

- 36 Fretless Bass
- 37 Slap Bass 1
- 38 Slap Bass 2
- 39 Synth Bass 1
- 40 Synth Bass 2

Strings

- 41 Violin
- 42 Viola
- 43 Cello
- 44 Contrabass
- 45 Tremolo Strings
- 46 Pizzicato Strings
- 47 Orchestral Harp
- 48 Timpani

Ensemble

- 49 String Ensemble 1
- 50 String Ensemble 2
- 51 Synth Strings 1
- 52 Synth Strings 2
- 53 Choir Aahs
- 54 Voice Oohs (or Doos)
- 55 Synth Voice or Solo Vox
- 56 Orchestra Hit

Brass

- 57 Trumpet
- 58 Trombone
- 59 Tuba
- 60 Muted Trumpet
- 61 French Horn
- 62 Brass Section
- 63 Synth Brass 1
- 64 Synth Brass 2

Reed

- 65 Soprano Sax
- 66 Alto Sax
- 67 Tenor Sax
- 68 Baritone Sax
- 69 Oboe
- 70 English Horn
- 71 Bassoon
- 72 Clarinet

Pipe

- 73 Piccolo
- 74 Flute
- 75 Recorder
- 76 Pan Flute
- 77 Blown bottle
- 78 Shakuhachi
- 79 Whistle
- 80 Ocarina

Synth Lead

- 81 Lead 1 (square)
- 82 Lead 2 (sawtooth)
- 83 Lead 3 (calliope)
- 84 Lead 4 (chiff)
- 85 Lead 5 (charang, a guitar-like lead)
- 86 Lead 6 (space voice)
- 87 Lead 7 (fifths)
- 88 Lead 8 (bass and lead)

Synth Pad

- 89 Pad 1 (new age or fantasia, a warm pad stacked with a bell)
- 90 Pad 2 (warm)
- 91 Pad 3 (polysynth or poly)
- 92 Pad 4 (choir)
- 93 Pad 5 (bowed glass or bowed)
- 94 Pad 6 (metallic)
- 95 Pad 7 (halo)
- 96 Pad 8 (sweep)

Synth Effects

- 97 FX 1 (rain)
- 98 FX 2 (soundtrack, a bright perfect fifth pad)
- 99 FX 3 (crystal)

100 FX 4 (atmosphere, usually a nylon-like sound)

101 FX 5 (brightness)

102 FX 6 (goblins)

103 FX 7 (echoes or echo drops)

104 FX 8 (sci-fi or star theme)

Ethnic

- 105 Sitar
- 106 Banjo
- 107 Shamisen
- 108 Koto
- 109 Kalimba
- 110 Bag pipe
- 111 Fiddle
- 112 Shanai

Percussive

- 113 Tinkle Bell
- 114 Agogô
- 115 Steel Drums
- 116 Woodblock
- 117 Taiko Drum
- 118 Melodic Tom or 808 Toms
- 119 Synth Drum
- 120 Reverse Cymbal

Sound Effects

- 121 Guitar Fret Noise
- 122 Breath Noise
- 123 Seashore
- 124 Bird Tweet
- 125 Telephone Ring
- 126 Helicopter
- 127 Applause
- 128 Gunshot

Appendix D

General MIDI Percussion (Channel 10)

Key# / Note	Drum Sound		
35 B0	Acoustic Bass Drum	58 Bb2	Vibraslap
36 C1	Bass Drum 1	59 B2	Ride Cymbal 2
37 C#1	Side Stick	60 C3	Hi Bongo
38 D1	Acoustic Snare	61 C#3	Low Bongo
39 Eb1	Hand Clap	62 D3	Mute Hi Conga
40 E2	Electric Snare	63 Eb3	Open Hi Conga
41 F1	Low Floor Tom	64 E4	Low Conga
42 F#1	Closed Hi Hat	65 F3	High Timbale
43 G1	High Floor Tom	66 F#3	Low Timbale
44 Ab1	Pedal Hi-Hat	67 G3	High Agogo
45 A1	Low Tom	68 Ab3	Low Agogo
46 Bb1	Open Hi-Hat	69 A3	Cabasa
47 B1	Low-Mid Tom	70 Bb3	Maracas
48 C2	Hi Mid Tom	71 B3	Short Whistle
49 C#2	Crash Cymbal 1	72 C4	Long Whistle
50 D2	High Tom	73 C#4	Short Guiro
51 Eb2	Ride Cymbal 1	74 D4	Long Guiro
50 E3	Chinese Cymbal	75 Eb4	Claves
53 F2	Ride Bell	76 E5	Hi Wood Block
54 F#2	Tambourine	77 F4	Low Wood Block
55 G2	Splash Cymbal	78 F#4	Mute Cuica
56 Ab2	Cowbell	79 G4	Open Cuica
57 A2	Crash Cymbal 2	80 Ab4	Mute Triangle
		81 A4	Open Triangle

Appendix E

MT-32 Instrument list

0	Acoustic Piano 1	49	String Section 2
1	Acoustic Piano 2	50	String Section 3
2	Acoustic Piano 3	51	Pizzicato
3	Electric Piano 1	52	Violin 1
4	Electric Piano 2	53	Violin 2
5	Electric Piano 3	54	Cello 1
6	Electric Piano 4	55	Cello 2
7	Honkytonk	56	Contrabass
8	Electric Organ 1	57	Harp 1
9	Electric Organ 2	58	Harp 2
10	Electric Organ 3	59	Guitar 1
11	Electric Organ 4	60	Guitar 2
12	Pipe Organ 1	61	Electric Guitar 1
13	Pipe Organ 2	62	Electric Guitar 2
14	Pipe Organ 3	63	Sitar
15	Accordion	64	Acoustic Bass 1
16	Harpsichord 1	65	Acoustic Bass 2
17	Harpsichord 2	66	Electric Bass 1
18	Harpsichord 3	67	Electric Bass 2
19	Clavinet 1	68	Slap Bass 1
20	Clavinet 2	69	Slap Bass 2
21	Clavinet 3	70	Fretless 1
22	Celesta 1	71	Fretless 2
23	Celesta 2	72	Flute 1
24	Synth Brass 1	73	Flute 2
25	Synth Brass 2	74	Piccolo 1
26	Synth Brass 3	75	Piccolo 2
27	Synth Brass 4	76	Recorder
28	Synth Bass 1	77	Pan Pipes
29	Synth Bass 2	78	Sax 1
30	Synth Bass 3	79	Sax 2
31	Synth Bass 4	80	Sax 3
32	Fantasy	81	Sax 4
33	Harmo Pan	82	Clarinet 1
34	Chorale	83	Clarinet 2
35	Glasses	84	Oboe
36	Soundtrack	85	English Horn
37	Atmosphere	86	Bassoon
38	Warm Bell	87	Harmonica
39	Funny Vox	88	Trumpet 1
40	Echo Bell	89	Trumpet 2
41	Ice Rain	90	Trombone 1
42	Oboe 2001	91	Trombone 2
43	Echo Pan	92	French Horn 1
44	Doctor Solo	93	French Horn 2
45	School Daze	94	Tuba
46	Bellsinger	95	Brass Section 1
47	Square Wave	96	Brass Section 2
48	String Section 1	97	Vibe 1

98	Vibe 2
99	Synth Mallet
100	Windbell
101	Glock
102	Tube Bell
103	Xylophone
104	Marimba
105	Koto
106	Sho
107	Shakuhachi
108	Whistle 1
109	Whistle 2
110	Bottleblow
111	Breathpipe
112	Timpani

113	Melodic Tom
114	Deep Snare
115	Electric Percussion 1
116	Electric Percussion 2
117	Taiko
118	Taiko Rim
119	Cymbal
120	Castanets
121	Triangle
122	Orche Hit
123	Telephone
124	Bird Tweet
125	One Note Jam
126	Water Bell
127	Jungle Tune

Appendix F

Control Change (CC) codes and values

CC (dec)	CC (hex)	description	values	notes
Modes:				
120	78	all sound off	any	
123	7B	all notes off	any	since v2.3.6, 78 and 7B perform an 'all notes off' on all channels regardless of MIDISID mode and omni mode
124	7C	omni mode off + all notes off	any	current mono/poly mode responds only to the channel that the message is sent on
125	7D	omni mode on + all notes off	any	current mono/poly responds to all channels
126	7E	mono mode + all notes off	any	
116	74	duo mode + all notes off †	any	
127	7F	poly mode + all notes off	any	
119	77	GM mode + all notes off	any	
118	76	MT32 mode + all notes off	any	
117	75	Mono mode voice selector	0-15 (0x0x) = voice 1, 16-31 (0x1x) = voice 2, 32-47 (0x2x) = voice 3, >=112 (0x7x) (ideally use \$7f) is 'all'	when in mono (and duo) mode, which SID voice certain CC controls apply to - 0,1,2 or all
Sound:				
				NB depending on the mode & omni status, the below may apply to a single channel / voice or all channels / voices
70	46	Waveform	8=triangle, 16=saw, 32=pulse, 64=noise.	Add values together to combine, but not all combinations will work. These combos are good: triangle+pulse, sawtooth+pulse, triangle+sawtooth
73	49	Attack	0-127	scaled down to 0-15 as 4-bit value on chip
75	4B	Decay	0-127	scaled down to 0-15 as 4-bit value on chip
76	4C	Sustain	0-127	scaled down to 0-15 as 4-bit value on chip
72	48	Release	0-127	scaled down to 0-15 as 4-bit value on chip
20	14	Pulse width	0-127	coarse - 52h (34d) reserved for fine. The value 0-127 covers *half* of the 12-bit pulse width range, because the the other half is the same in reverse.
21	15	PWM speed	0-127	coarse - 53h (35d) reserved for fine
22	16	PWM depth	0-127	coarse - 54h (36d) reserved for fine
Filter:				
				NB one filter per chip. Therefore affects all voices in mono or poly mode. Not implemented for MIDI & MT32 modes
23	17	Filter type	v<16 = none, v>=16 lowpass, v>=32 highpass, v>=48 bandpass, v>=64 notch	
74	4A	Cutoff frequency	0-127	scaled up, as 8-bit value on chip.
71	47	Resonance	0-127	scaled down to 0-15 as 4-bit value on chip

CC (dec)	CC (hex)	description	values	notes
111	6F	Filter routing		Reserved but not implemented in MIDISID or the control surface
Filter sweep:				
24	18	Sweep off / speed	0-127	scaled down to off and 1-5
25	19	Sweep Cutoff start	0-127	scaled up, as 8-bit value on chip. 57 (39) reserved for fine This sets the FCO but also activates the sweep if >0 or deactivates sweep if 0
26	1A	Sweep Cutoff end	0-127	scaled up, as 8-bit value on chip. 58 (3A) reserved for fine
				sweep direction (up or down) is implied by whether end is higher or lower than start
Vibrato:				
27	1B	Vibrato delay	0-127	
28	1C	Vibrato speed	0-127	
29	1D	Vibrato depth	0-127	
Portamento:				
65	41	Portamento On/Off	≤63 off, ≥64 on	Port / Arp / Replace / Ignore are mutually exclusive, and don't apply to polyphonic modes, ie poly and duo. See also CC115
5	5	Portamento speed	0-127	
Arpeggiation				
14	0E	Arpeggiation on/off	≤63 off, ≥64 on	Port / Arp / Replace / Ignore are mutually exclusive, and don't apply to polyphonic modes, ie poly and duo. See also CC115
30	1E	Arpeggiation speed*	0-127	0 slowest, 127 (scaled down and shown as 15 in the menu) fastest
31	1F	Arpeggiation pattern*	0-4	0=Up, 1=Down, 2=Converge, 3=Diverge, 4=Random
115	73	Handling of one note starting before previous one stops, aka 'multiple notes' †	v>=16 replace, v>=32 ignore, v>=48 portamento, v>=64 arpeggiation	Obviously the port and arp options duplicate CC14 and CC65 but since these options are related and mutually exclusive, they're also provided for convenience on this single CC. Values 0-15 available for future expansion since there is no 'none' option. Can only work in mono/GM/MT32 modes although replace and ignore could be useful with the poly and duo modes.
Effects				
114	72	Sync / Ring switch †	Bitwise. 0=none, 1=sync, 2 = ring, 3 = both	These are similar to the bits in the SID control register for each byte, for convenience and to allow for future expansion. Works in mono/duo modes and act on the currently-selected mono voice (CC117)
113	71	Tuning, coarse †	actual values TBC	There are standard RPNs for these, but using those involves sending several messages and they're geared towards relative adjustment rather than absolute values.
112	70	Tuning, fine †	actual values TBC	These are required in order to use ring modulation. Currently they work in mono/duo modes and act on the currently-selected mono voice (CC117)
110	6E	Mute voice 3	≤63 off (not muted), ≥64 on (muted)	

For controllers that act on mono voices, the selected mono voice is used (CC117).
Send on any channel, or on the specific channel if mono mode is set to listen on a specific channel.
By default the surface sends on channel 16
In GM mode, send on the channel corresponding with the voice, ie 1-6.

Appendix G

Version control

Firmware

Version 1.0.0 July 2026 :
First public release

PCB set

July 2026:
First public release

This document

July 2026:
First public release

Contact shiela@peacockmedia.co.uk about firmware revisions or the correct manual for your hardware.

Appendix Y

Credits

Aside from the SIDs, MIDISID and its firmware, the MIDISID control surface and its firmware are entirely designed and coded by Shiela Dixon / PeacockMedia.

Appendix Z

Planned features