

ED107 PolyDAC (X) MIDI-CV User Guide

February 21, 2021

Introduction

The ED107- PolyDAC(X) is a powerful and flexible 4-note polyphonic MIDI to CV converter that was originally designed by Paul Maddox with assistance from Tony Allgood who also initially marketed the product.

The ED107 - PolyDAC (X) has the following outputs:-

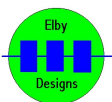
- 4 off GATE outputs, factory adjustable from 5V to 10V,
- 4 off NOTE outputs, calibrated to 1V/Octave,
- 4 off VELOCITY outputs, scaled over the range 0V to 10V
- 1 off PITCHBEND, -1V to +1V
- 1 off MODULATION WHEEL, 0V through to 10V
- 1 off AFTERTOUCH, 0V through to 10V
- 1 off SUSTAIN, switches from 0V to 10V
- 4 off CV outputs, 0V through to 10V.

Two control knobs are also provided:-

- TUNE, a global tuning control for all NOTE outputs
- BEND, controls how far the PITCHBEND will go.

Finally, 4 switches provide the following functionality:-

- RETRIGGER - when set to ON, if a new note comes in whilst an old one is held, then the GATE will 'dip' briefly resulting in a new 'trigger' signal
- MODE – selects one of three modes of operation for the PolyDAC(X):-
 - POLY, this gives you MIDI to CV conversion for 4 voices, each with its own Note CV, Velocity CV and Gate. Also generated are CVs that correspond to PitchWheel, ModWheel, AfterTouch, Sustain and four user-definable MIDI CCs.
 - MONO 1, This mode gives you a monophonic MIDI to CV converter. The four *voices* all play the same note/gate allowing for some monster stacking of oscillators. It also has a choice of Retrigger mode and features a 16 note deep note stack. It has CV outputs for PitchWheel, ModWheel, AfterTouch, Sustain, as well as four user-definable MIDI CCs.
 - MONO 2, This mode gives you four channels of monophonic MIDI to CV conversion. The 4 channels all being consecutive (eg, 4, 5, 6 and 7). In this mode the PitchWheel, ModWheel, AfterTouch, Sustain and four user definable MIDI CCs are controlled by the MIDI channel assigned to *voice 1* only. Retrigger sets retrigger on or off for all four channels. Each channel has its own 16 note deep note stack.
- IGNORE/STEAL - A choice within POLY mode allows *note steal* or *note ignore* for new notes once all 4 voices are in use. With *note steal* mode on you can also turn Retrigger on or off, which will retrigger the gate for the new note.
- ASSIGN – this allows you to assign MIDI CC's to the 4 CV outputs.



Using the ED107 - PolyDAC(X)

Assigning CC's

To use the ASSIGN mode, hold the Assign button for approximately 2 seconds, the MIDI light will come on solid for a moment and then flash once. Release the ASSIGN switch once the MIDI light comes on. This will signify that it is waiting for the first MIDI CC (CC1) to be assigned. Next send a MIDI CC command from your controller, the MIDI light will light solid for a moment, and then flash twice, it will now wait for the second MIDI CC (CC2) to be assigned.

If you don't send anything for a while, the unit will exit the ASSIGN mode and wait for MIDI data as per normal.

You have 4 assignable MIDI CCs, by default they are as follows:-

- CC1 = 74 (cut-off)
- CC2 = 7 (volume)
- CC3 = 5 (portamento)
- CC4 = 2 (breath controller).

The MIDI LED will light whenever a valid command is received that the PolyDAC(X) acts upon including note data, pitchbend, controller etc.

The 4 voice LEDs light when a voice is active.

Calibrating VCO's

To aid with calibration of VCO's connected to the ED107 the following procedure should be followed.

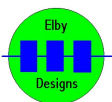
Set the MIDI Address switch to '1'.

Hold the Assign button for approximately 2 seconds, the MIDI light will come on solid for a moment and then flash once. Continue to hold the ASSIGN until all 4 Voice LED's flash together. Release the ASSIGN switch.

The first 5 MIDI Addresses can now be selected to output 1V, 2V, 3V, 4V and 5V respectively to all 4 voice outputs.

External PITCHBEND and MODULATION WHEEL connections

Please refer to the enclosed wiring documents for details on terminating an external PITCHBEND and MODULATION WHEEL.



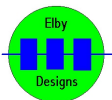
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Polyphonic Mode

The current firmware for the ED107 uses a Regular Cyclic Mode for polyphonic operation.

In this mode, incoming MIDI notes are assigned the next free voice (even if it is the same note played repeatedly). Each time you play a note it will step through and assign channels 1 then 2 then 3 then 4 then back to 1 again as you play.

If you hold a note, new notes will be assigned to the next voice in that order that is free. If all voices are already assigned to held notes, the next note will use the lowest voice held.



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MIDI-CV MIDI Note Table

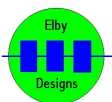
	-1	0	1	2	3	4	5	6	7	8	9
	8.176	16.352	32.703	65.406	130.813	261.626	523.251	1046.502	2093.004	4186.007	8372.014
C	0	12	24	36	48	60	72	84	96	108	120
	0.000	1.000	2.000	3.000	4.000	5.000	6.000	7.000	8.000	9.000	10.000
	8.662	17.324	34.648	69.296	138.591	277.183	554.365	1108.730	2217.460	4434.920	8869.840
C#	1	13	25	37	49	61	73	85	97	109	121
	0.083	1.083	2.083	3.083	4.083	5.083	6.083	7.083	8.083	9.083	10.083
	9.177	18.354	36.708	73.416	146.832	293.665	587.329	1174.659	2349.317	4698.634	9397.268
D	2	14	26	38	50	62	74	86	98	110	122
	0.167	1.167	2.167	3.167	4.167	5.167	6.167	7.167	8.167	9.167	10.167
	9.723	19.445	38.891	77.782	155.563	311.127	622.254	1244.507	2489.015	4978.029	9956.058
D#	3	15	27	39	51	63	75	87	99	111	123
	0.250	1.250	2.250	3.250	4.250	5.250	6.250	7.250	8.250	9.250	10.250
	10.301	20.602	41.203	82.407	164.814	329.627	659.255	1318.510	2637.019	5274.038	10548.076
E	4	16	28	40	52	64	76	88	100	112	124
	0.333	1.333	2.333	3.333	4.333	5.333	6.333	7.333	8.333	9.333	10.333
	10.913	21.827	43.654	87.307	174.614	349.228	698.456	1396.912	2793.825	5587.649	11175.298
F	5	17	29	41	53	65	77	89	101	113	125
	0.417	1.417	2.417	3.417	4.417	5.417	6.417	7.417	8.417	9.417	10.417
	11.562	23.125	46.249	92.499	184.997	369.994	739.989	1479.977	2959.954	5919.908	11839.815
F#	6	18	30	42	54	66	78	90	102	114	126
	0.500	1.500	2.500	3.500	4.500	5.500	6.500	7.500	8.500	9.500	10.500
	12.250	24.500	48.999	97.999	195.998	391.995	783.991	1567.981	3135.962	6271.924	12543.847
G	7	19	31	43	55	67	79	91	103	115	127
	0.583	1.583	2.583	3.583	4.583	5.583	6.583	7.583	8.583	9.583	10.583
	12.978	25.957	51.913	103.826	207.652	415.305	830.609	1661.218	3322.436	6644.872	
G#	8	20	32	44	56	68	80	92	104	116	
	0.667	1.667	2.667	3.667	4.667	5.667	6.667	7.667	8.667	9.667	
	13.750	27.500	55.000	110.000	220.000	440.000	880.000	1759.999	3519.998	7039.997	
A	9	21	33	45	57	69	81	93	105	117	
	0.750	1.750	2.750	3.750	4.750	5.750	6.750	7.750	8.750	9.750	
	14.568	29.135	58.270	116.541	233.082	466.164	932.327	1864.654	3729.308	7458.617	
A#	10	22	34	46	58	70	82	94	106	118	
	0.833	1.833	2.833	3.833	4.833	5.833	6.833	7.833	8.833	9.833	
	15.434	30.868	61.735	123.471	246.942	493.883	987.766	1975.532	3951.065	7902.129	
B	11	23	35	47	59	71	83	95	107	119	
	0.917	1.917	2.917	3.917	4.917	5.917	6.917	7.917	8.917	9.917	

KEY

Note	Name		440.000	Frequency In Hertz
		A	69	MIDI Note Number
			5.750	MIDI-CV Based on 1V/Octave

Half-tone factor = 1.05946309

Table based on A = 440Hz



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