



# PolyDAC (X)

## User Guide

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## Introduction

The 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 PolyDAC (X) has the following outputs:-

- 4 off GATE outputs, factory adjustable from 5V to 15V,
- 4 off NOTE outputs, calibrated to 1V/Octave, and
- 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 AFTERTOUCHE, 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 PolyDAC(X)

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. 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.

### External PITCHBEND and MODULATION WHEEL connections

Please refer to the enclosed wiring documents for details on terminating an external PITCHBEND and MODULATION WHEEL. For PolyDAC(X)s fitted with jacks incorporating a double-pole switch the plugs are wired as normal. For PolyDAC(X)s fitted with jacks incorporating only a single-pole switch readers should note that the MODULATION WHEEL connector needs to be wired differently.

### PolyDAC-1U

The PolyDAC-1U builds the PolyDAC in to a 1U full width 19" sub-rack. Supplementing the PolyDAC in this build is a small power supply module which allows the unit to be powered from either a single-rail DC supply.

The plug-pack should:-

- 1) Supply a well-regulated 15VDC @ 250mA.
- 2) Have a 2.5mm DC Barrel connector with Tip = +ve.

When this unit is delivered it will not have the Rack Ears installed. Carefully prise open the case by teasing the top section away from the rest of the assembly. Slide in the supplied Rack Ears, replace the top section ensuring that no wires get trapped between the case support pillars, and secure using the 4 screws supplied.



# PolyDAC (X) Manual

## MIDI-CV MIDI Note Table

	0	1	2	3	4	5	6	7	8	9	10
	16.352	32.704	65.408	130.816	261.632	523.264	1046.528	2093.055	4186.110	8372.220	16744.440
<b>C</b>	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
	17.324	34.649	69.297	138.595	277.189	554.379	1108.757	2217.515	4435.029	8870.058	17740.116
<b>C#</b>	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
	18.354	36.709	73.418	146.836	293.672	587.344	1174.688	2349.375	4698.750	9397.499	18794.998
<b>D</b>	2	14	26	38	50	62	74	86	98	110	122
	0.166	1.166	2.166	3.166	4.166	5.166	6.166	7.166	8.166	9.166	10.166
	19.446	38.892	77.784	155.567	311.135	622.269	1244.538	2489.076	4978.152	9956.304	19912.607
<b>D#</b>	3	15	27	39	51	63	75	87	99	111	123
	0.249	1.249	2.249	3.249	4.249	5.249	6.249	7.249	8.249	9.249	10.249
	20.602	41.204	82.409	164.818	329.636	659.271	1318.542	2637.084	5274.168	10548.336	21096.672
<b>E</b>	4	16	28	40	52	64	76	88	100	112	124
	0.332	1.332	2.332	3.332	4.332	5.332	6.332	7.332	8.332	9.332	10.332
	21.827	43.655	87.309	174.618	349.237	698.473	1396.947	2793.894	5587.787	11175.573	22351.145
<b>F</b>	5	17	29	41	53	65	77	89	101	113	125
	0.415	1.415	2.415	3.415	4.415	5.415	6.415	7.415	8.415	9.415	10.415
	23.125	46.250	92.501	185.002	370.003	740.007	1480.014	2960.027	5920.054	11840.107	23680.213
<b>F#</b>	6	18	30	42	54	66	78	90	102	114	126
	0.498	1.498	2.498	3.498	4.498	5.498	6.498	7.498	8.498	9.498	10.498
	24.500	49.001	98.001	196.003	392.005	784.010	1568.020	3136.039	6272.079	12544.157	25088.312
<b>G</b>	7	19	31	43	55	67	79	91	103	115	127
	0.581	1.581	2.581	3.581	4.581	5.581	6.581	7.581	8.581	9.581	10.581
	25.957	51.914	103.829	207.657	415.315	830.630	1661.259	3322.518	6645.036	13290.071	
<b>G#</b>	8	20	32	44	56	68	80	92	104	116	
	0.664	1.664	2.664	3.664	4.664	5.664	6.664	7.664	8.664	9.664	
	27.501	55.001	110.003	220.005	440.011	880.021	1760.043	3520.085	7040.170	14080.340	
<b>A</b>	9	21	33	45	57	69	81	93	105	117	
	0.747	1.747	2.747	3.747	4.747	5.747	6.747	7.747	8.747	9.747	
	29.136	58.272	116.544	233.088	466.175	932.350	1864.700	3729.400	7458.800	14917.600	
<b>A#</b>	10	22	34	46	58	70	82	94	106	118	
	0.830	1.830	2.830	3.830	4.830	5.830	6.830	7.830	8.830	9.830	
	30.868	61.737	123.474	246.948	493.895	987.791	1975.581	3951.162	7902.324	15804.647	
<b>B</b>	11	23	35	47	59	71	83	95	107	119	
	0.913	1.913	2.913	3.913	4.913	5.913	6.913	7.913	8.913	9.913	
Note Name			440	Frequency in Hertz							
	A		57	MIDI Note Number							
			4.747	MIDI-CV							

Half-tone factor = 1.05946309  
 Table based on A = 440Hz = A4

