

MIDI Driver Board

Model DC-96

Instructions for Installation and Configuration

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1. Introduction

DesignTech Systems' DC-96 MIDI driver is designed to convert MIDI signals from software packages such as Hauptwerk into DC outputs. Outputs can be either continuous, for driving chest magnets or indicator lamps, or pulsed for driving Stop Action Magnets (SAMs).

DC-96 can drive up to 96 chest magnets or indicators, or 48 SAMs. DC-96 is available in common positive and common ground versions.

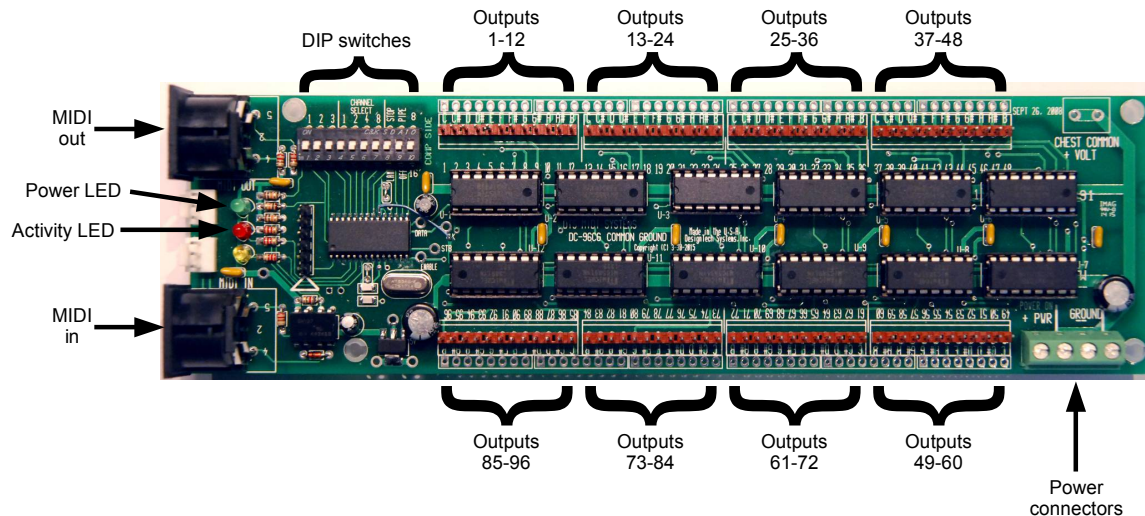
DIP switches are used to select between the following four modes:

In *test mode*, each output is pulsed in turn. If the DC-96 is connected to stop action magnets, you should see each stop switch on-off, on-off in turn. If it connected to a pipe chest, you should hear a rising *marcato* chromatic scale.

In *pipe mode* or *lamp mode*, a MIDI “note on” message will cause an output line to turn on, and a “note off” message will cause the output line to turn off.

In *stop mode*, a MIDI “note on” message will cause an output “on” magnet to be energized for 150ms, and a “note off” message will cause the corresponding “off” magnet to be energized for 150ms.

2. Connections



Power in: An 8v to 15v DC supply should be connected to the screw terminals provided, with the positive line to the left.

MIDI in: A standard MIDI-compliant input. MIDI “note on” and “note off” messages which match the channel and note range settings on the DIP switches will cause the outputs to be energized. Any other MIDI messages will be forwarded to the MIDI out port.

MIDI out: A standard MIDI output. Any MIDI information received which does not match the channel and note range set on the DIP switches is forwarded to MIDI out..

Note that the MIDI in and out connections are also provided on 0.1” pitch headers, in case you prefer not to use 5-pin DIN plugs.

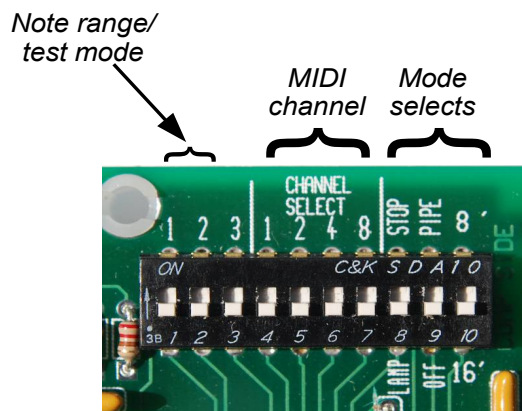
DIP switches: These are used for configuring the DC-96 and selecting the MIDI channel. The DIP switches are described in detail below.

Power LED: Green LED which lights to show that the board is supplied with power.

Activity LED: Red LED which flashes whenever a MIDI message is received. If the incoming message is a “note on” or “note off” message which matches the channel and note range selected on the DIP switches, you will see a clearly visible flash of about 50ms. If any other MIDI message is received, this

will be forwarded to the MIDI out port and the LED will give a much shorter “wink” of about 8ms.

3. DIP switches



Mode select switches

Pipe mode select (switch 9) and pitch select (switch 10):

If this switch is on (with the slider nearest to the card edge), the DC-96 will operate as a pipe driver. When a MIDI “note on” message is received an output will be turned on and when a MIDI “note off” message is received the output will be turned off.

If the pitch select switch is set to 8', output 1 will correspond to MIDI note 36 (bottom C on an 8' rank). If the pitch select switch is set to 16', output 1 will correspond to MIDI note 24.

Lamp / stop select (switch 8):

If pipe mode is off (switch 9), the DC-96 will look at the lamp/stop select switch (switch 8).

If lamp mode is selected, the DC-96 will operate in a very similar way to pipe mode, with a MIDI “note on” message causing an output to be turned on and a MIDI “note off” message causing it to be turned off. However, output 1 will correspond to either MIDI note 0 or 96, depending on the position of switch 1 (see below).

If stop mode is selected, the DC-96 output lines should be connected to the “on” and “off” coils of stop action magnets (SAMs). Odd-numbered outputs should be connected to “on” coils and even-numbered outputs should be connected to “off” coils. The 96 outputs can therefore control up to 48 SAMs. When a MIDI “note on” message is received, a pulse of

current will be sent to an “on” coil. When a MIDI “note off” message is received, a pulse of current will be sent to the corresponding “off” coil. These current pulses are 150ms long.

Note range / test mode switches (switches 1 and 2)

These switches are used to select the MIDI note range being used if the DC-96 is in stop mode or lamp mode. They are also used to put the DC-96 into test mode. The settings are shown below:

Switch		Note range (stop mode)	Note range (lamp mode)
1	2		
		0 - 47	0 - 95
X		48 - 95	96 - 127
	X	96 - 127	0 - 95
X	X	<i>Test mode</i>	

MIDI channel select switches

The MIDI channel select switches work as follows:

Switch				MIDI channel
4	5	6	7	
				1
X				2
	X			3
X	X			4
		X		5
X		X		6
	X	X		7
X	X	X		8
			X	9
X			X	10
	X		X	11
X	X		X	12
		X	X	13
X		X	X	14
	X	X	X	15
X	X	X	X	16

4. Output wiring

DC-96 can be supplied in either a “pull to ground” (a.k.a. “common positive”) or “pull to positive” (common ground) configuration. Each driver is rated at 50v and 500mA. The driver circuits incorporate freewheel diodes, so they can be safely connected to inductors (i.e. magnets). We recommend that the outputs for each card be connected to common via a slow-blow fuse of appropriate rating.

5. MIDI connections

We recommend using a high quality, recognized brand device to convert between MIDI and USB. We have found two midrange units to be reliable in many different configurations: the Cakewalk UM-1G and the M-Audio MIDIsport 2x2. Both are available from most music retailers. We have no connection with either company.

In theory, it is possible to “daisy-chain” any number of DC-96 cards together by connecting the MIDI out port of one to the MIDI in port of the next. However, for best performance, we recommend that no more than two decoder cards be connected together in this way. If you use more cards than this, we recommend use of a multi-way MIDI converter such as an M-Audio MIDIsport 4x4.