

BiasDAC specs  
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BiasDAC is a 4-channel high-resolution low-drift low-speed D/A converter board. It is a stand-alone board which communicates through a computer or controller through RS-232 or fiber optic cables running a standard asynchronous protocol. It was designed to generate static or slowly varying voltages for control of electrode potential, among other applications. The four channels are individually isolated, which helps to control ground loops.

**Form Factor:**

7" x 7" Printed Circuit Board

**Cost:**

\$1050 assembled and tested.

**Isolation:**

100V, 1 MOhm from each channel to the common ground. Both the voltage and the resistance can be increased if the application demands it.

**Output Voltage Range:**

0 to 5V, 0 to 10V, -2.5V to +2.5V, -5V to +5V, -10V to +10V,  
jumperable on a channel-by-channel basis.

Differential outputs and offset outputs are possible, although with increased drift.

**Output Impedance:**

50 Ohms

**Resolution:**

20 bits (approx. 1 ppm)

**Linearity Error:**

+/- 1 LSB

**Thermal Drift:**

With thermal control: +/- 5 ppm typical

Without thermal control: +/- 15 ppm/C worst case

**Long-Term Drift:**

30 ppm/1000h typical

**Bipolar Drift from Zero:**

(How much you can expect the output of the DAC to drift from midscale, which produces 0V out in bipolar mode.)

With thermal control: +/- 3ppm typical.

Without thermal control: +/- 10 ppm/C worst case

**Recalibration Error:**

(Error introduced by power-cycling the box)

+/- 10 ppm worst case

**Update Rate:**

100 Hz

**Noise:**

Not yet measured

**Thermal Control:**

The thermally sensitive components are located in such a way that a 5/8" or 3/4" aluminum bar may be mounted over them to create an isothermal area. To aid in active temperature control, the board includes a thermal sensor located in the middle of the isothermal area, and an extra DAC, which can be connected to a thermoelectric cooler.

**Power Requirement:**

+15VDC at 500 mA typical, excluding thermoelectric cooling.

**Interface:**

Asynchronous RS-232 (no hardware handshaking) or Fiberoptic (840 nm, ST termination). The topology is a ring with a single host and up to 61 BiasDACs. The serial output of the host is connected to the first device in the chain. The output of the first device goes to the input of the second device, etc. The output of the last device goes back to the host. Thus, the host can control up to 61 devices with a single serial I/O port. Supports the following bauds: 9600, 19200, 38400, 57600

**Autonomous Operation:**

As mentioned above, the target can be programmed to run autonomously, thus generating waveforms without host intervention. Waveform generation can be synchronized to external events with two input triggers. Two output triggers can provide synchronization to other devices. Refer to the Communications Protocol Document for further details.