

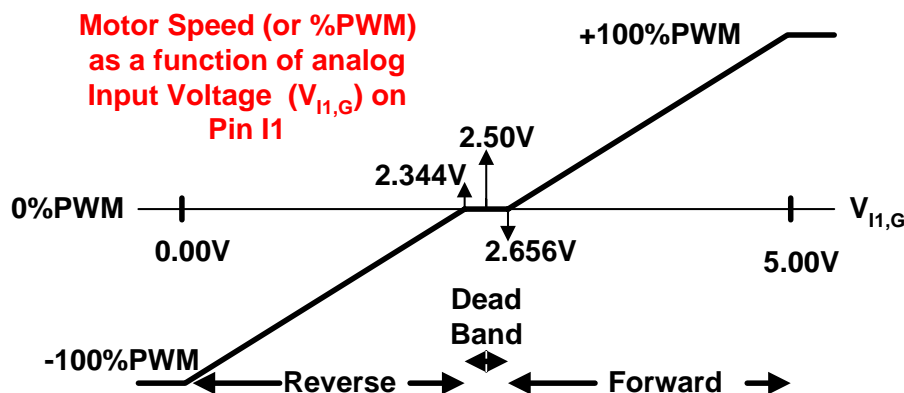
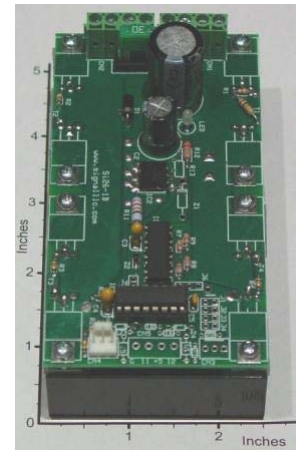
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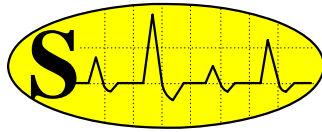
Si30BaBdMC1-50V-30A, 50V-30A Open-Loop, Biased Analog Input, Bidirectional DC Motor Controller, with Soft-Start/Stop, Integrated Finned Heat-Sink, RS232 LCD Port, 5kHz or 20kHz PWM, Y-chip

The **Si30BaBdMC1-50V-30A** is a 50V 30A, microprocessor based, high-power, Biased Analog Input, Bidirectional, Motor Controller with user selectable Soft-Start and Soft-Stop features. This controller uses a single (12V to 50V at 0 to 30A) DC power supply to control the speed of a DC motor in forward or reverse direction. An onboard microprocessor generates a 5kHz or 20kHz **PWM** carrier signal, controls the load-power (or motor speed), controls the load-current rate (or motor acceleration and deceleration), updates the Liquid Crystal Display (LCD) and monitors the user inputs. An active low "Kill-Switch" input (on **CN4**) is used to stop the motor rotation under emergency conditions: **CN4 open=Run, CN4 short=Stop**. The **PWM** carrier frequency is user selectable by the jumper **J2**, 20kHz when **J2** is open and 5kHz when short. This high frequency PWM rate insures a quiet motor environment. The user can choose between slow or fast motor acceleration/deceleration modes by short-circuiting or open-circuiting the pins labeled **J1**. The slow mode, with rise-time/fall-time of 1.25Sec, is selected by short-circuit (**J1** jumper installed); while the fast buildup mode, with rise-time/fall-time of 0.05s, is selected by leaving these pins open (no Jumper installed). As the name Biased Analog Input (**Ba**) implies the required motor speed (or PWM pulse-duration) and rotational direction is determined by an analog Input voltage (on pin **I1**) ranging from +2.656V to +5V for forward direction and +2.344 to 0V for reverse direction and a small "dead-band" at 2.5V (as shown below). All inputs are optically isolated or zener-diode protected. A bicolor LED is used to monitor the motor (or load) voltage (Red = Forward, Green = Reverse). An LCD port (with 9600 Baud RS232 Standard) is provided for optional display of motor RPM data in a 2 line by 16 character format (on **CN3**). A small (4.6"x2.5"x1.0") integrated finned heat-sink is used to operate at 30A current levels. Higher current-levels (40A) can be achieved with more efficient heat-sinks. Please click on this link and read the [Board Mounting Instructions and Heat Sink Selection Guide](#). This board operates in a wide voltage-range (12V to 50V) at maximum continuous load current of 30A. Typical applications are: Bi-directional DC Motor-Speed Controller, Peltier Effect TE Coolers, Heat Pumps, DPDT Solid State Relay, etc. This board can be configured and programmed to perform efficiently in many customized applications.



All control lines (analog and digital) are sampled approximately at 80Hz rate in the fast mode (**J1** jumper open), and at 8Hz rate in the slow mode (**J1** jumper short).

Specification and Application of **Si30BaBdMC1-50V-30A**



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- **Typical Operating Temperature at 30A:** 45°C with the Metal Heat-Ring Bolted to the (4.6"x2.5"x1.0") Finned Heat-Sink, while it is exposed to air at 25°C (as shown on photograph).
- **Source-Voltage Requirement:** 12V to 50V DC for V_P (pin +P to pin -P) unregulated DC voltage.
- **Average Load Voltage (from pin +L to pin -L):** 0V at 0% Duty-Cycle and V_p at 100% Duty-Cycle.
- **Max. Continuous Load Current:** 30A at 100% Duty-Cycle.
- **Max. Load Current for 5Sec:** 50A at 100% Duty-Cycle.
- **Two User Selectable Motor Acceleration/Deceleration Modes:** Using Jumper, on Port **J1**.
- **Two User Selectable PWM Modes:** Using Jumper, on Port **J2**.
- **Motor Kill Switch:** Active Low Control (4.7k Ohm, internal Pull-Up to +5V) on **CN4**.
- **Motor-Speed Control (%PWM):** 5k Ohm Analog Pot, (0 to 5V), on **CN5**.
- **LCD Display Format:** 9600 Baud, RST232 Protocol, on **CN3**.
- **Load Isolation:** The Load or Motor must be isolated from the source voltage (V_P).
- **Power-Conversion Efficiency:** Approximately 98.5% at full-load (50V and 20A).
- **Load-Voltage Indicator:** A bicolor LED monitors the Load Voltage (Red=Forward, Green=Reverse)
- **Voltage Requirement:** The Si30 will work with any DC Source in the 12 to 50 V range at 30A rating.
- **Overall Dimensions:** 4.6"x2.43"x2.35", (117 x 62 x 60 mm).

A Typical Application of the **Si30BaBdMC1-50V-30A**

In this open-loop application, the PWM or motor speed (in forward or reverse direction) is adjusted by an external linear 1-turn 5kΩ potentiometer (Signal Part number [Si5Pot1-5k](#)); while a normally open "kill-switch" connected to port **CN4** is used to stop the motor rotation under emergency conditions. The LCD module can be ordered from Signal with the part number of [Si14LCD2L16CH](#) (2 line by 16 character display with 12" cable and 3-pin connector). **Warning: The connecting wires to the Load and the Power Supply must be heavy gauge copper wire (#12 AWG or heavier) to handle the rated current level. In addition, these heavy gauge wires act as a heat sink, protecting the board from overheating. Note that each connecting point on CN1 is available at 2 places, thus two smaller wires can be used in place of a larger one.**

