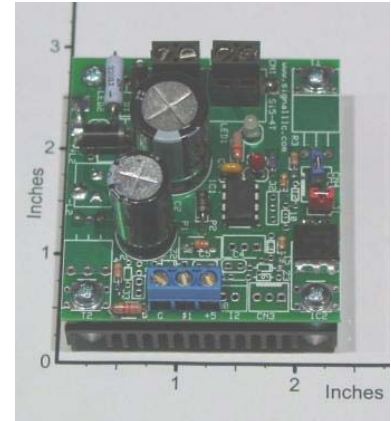




Si5PumpC1-50V-20A, 50V 20A Battery Operated Pump Controller with Soft Start/Stop and with Heat Sink for DC Motors, T-Chip

The **Si5PumpC1-50V-20A** is a 50V 20A microprocessor-based pump controller board with an integrated heat sink that softly turns the current on or off to a 12V to 48V, 1000W DC motor when the proper battery voltage and fluid level conditions are acquired. At power turn-on, the battery voltage is measured and the **motor is turned fully on if the battery voltage is greater than V_{BH} , (V_{BH} =Threshold Voltage High, user adjustable via. 25Turn Trim-Pot, P1) and the fluid level is low**; otherwise the motor current is turned off. Once the motor is running, it will be kept in the ON-state until the battery voltage is reduced below **V_{BL} , (V_{BL} =Threshold Voltage Low, user adjustable via. 25Turn Trim-Pot, P2)**; at this point, the motor turns off. A 5 Sec loop-delay is included to prevent motor chatter. An external, normally-closed or normally-open (**J1= Short=Normally-Open, J1= Open=Normally-Closed**) mechanical float-switch is used to stop the motor rotation whenever the fluid tank is full. This switch is connected to **CN3**; it is always active and overrides all other control conditions. The threshold voltages **V_{BH} and V_{BL}** are user adjustable with factory default values of: **$V_{BH} = 30V$ and $V_{BL} = 16V$** . An onboard LED (red) is used to monitor the load-voltage. The soft Motor Turn-ON/OFF uses 5kHz PWM speed control with 1.2sec ramp time. This feature assures long motor life. The LED is ON when the motor is running; and it is off, when the motor is stopped. A small (2.3"x2.4"x0.45") finned integrated heat sink is included with mounting hardware (as shown on the photograph) to operate at 20A or 1000W power levels. Higher power-levels (50V, 30A or 1500W) 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 requires a single 10V to 50V DC power source (unregulated) at a 0A to 20A current range to operate normally. Typical applications are: Battery Operated Water Pump Controller, Sewage Pump Controller, etc. This board can be configured and programmed to perform efficiently in many customized applications.



Specification and Application for **Si5PumpC1-50V-20A**

- **Typical Operating Temperature at 20A:** 45°C with the Metal Heat-Ring Bolted to a small (2.3"x2.4"x0.45") finned Aluminum Heat-Sink, while exposed to air at 25°C (as shown on photograph). **Source-Voltage Requirement (V_P from pin +P to pin -P):** Any DC voltage from 10V to 50V, unregulated and unfiltered DC.
- **Average Load-Current:** 0A when motor is turned off and 20A max. when the motor is running.
- **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).
- **Motor-Loop Delay:** A 5 Sec loop-delay is included to prevent motor chatter.
- **Soft Motor Start/Stop:** 5kHz PWM speed control with 1.2sec ramp time.



Signal Consulting, LLC

16 Wilelinor Drive, Edgewater, MD 21037-1003 USA

Phone: 410-224-8429, Fax: 410-510-1821, E-mail: info@signallc.com

- **Water Level Switch:** An external Normally-Closed or Normally-Open mechanical float-switch prevents over filling of the fluid tank by turning off the motor current whenever the tank is full. This switch is connected to port **CN3** as shown on the application diagram, given below.
- **User Selectable Float Switch:** A user installable jumper (at **J1**) is used to select the type of float switch is used at port **CN3**: If J1 is open (no jumper), then Normally Closed Float-Switch is used. If J1 is short (jumper is installed), then Normally Open Float-Switch is used.
- **Battery Voltage Ranges:** The Battery Voltage must be greater than the threshold voltage V_{BH} to start the motor. Once the motor is running, it will keep running until the battery voltage is reduced below V_{BL} . At this point, the motor is turned off. These threshold voltages are user adjustable with 25 turn trim-pots, **P1** and **P2** respectively.
- **Motor-Indicator and Board Protection:** An onboard LED (red) is used to monitor the motor (or load) voltage.

About the Voltage Requirement: The Si5 will work with any DC motor or load in the 10 V to 50 V voltage range. In addition, the power filters are included on this board, consequently, only unfiltered DC input power is required in most applications.

A Typical Application of the **Si5PumpC1-50V-20A**

In this application, a 48V, 1000W DC motor, is turned on or off in accordance with the control requirements of the pump, as described above.

The DC Motor can be purchased from Bodine, www.bodine-electric.com ; or from other vendors, http://www.e-motorsonline.com/emotors/dcmproduct_list.php .

