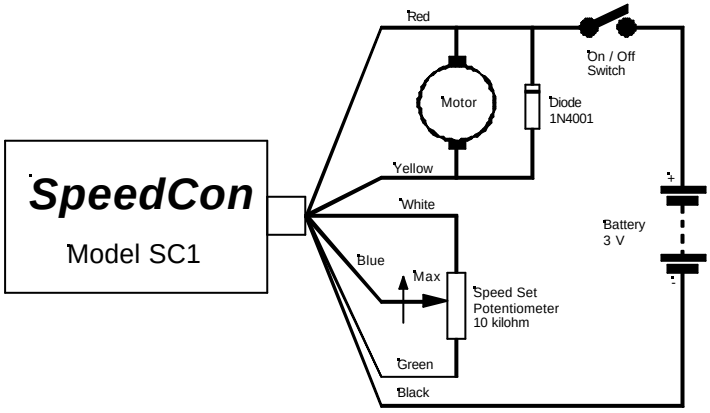
Operation

SpeedCon Model SC1 is an advanced microprocessor controlled model railway motor speed controller with an output range between zero and full battery voltage. It combines excellent performance with high efficiency.

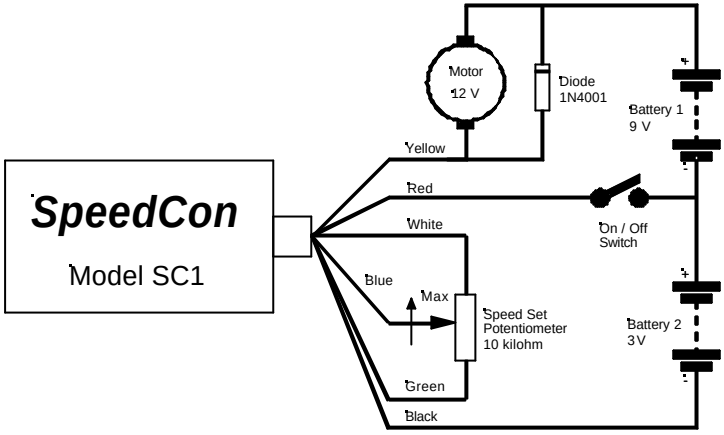
SpeedCon is primarily designed for use with battery powered rolling stock fitted with 1.5 or 3 V motors, but can also be used for motors up to 12 V. The maximum continuous motor load is 1 A.

Connections - for 1.5 V to 3 V Motors

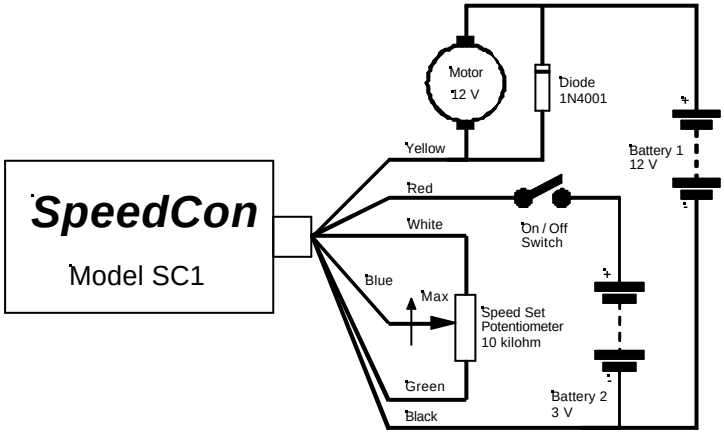


Connections - for Motors above 3 V

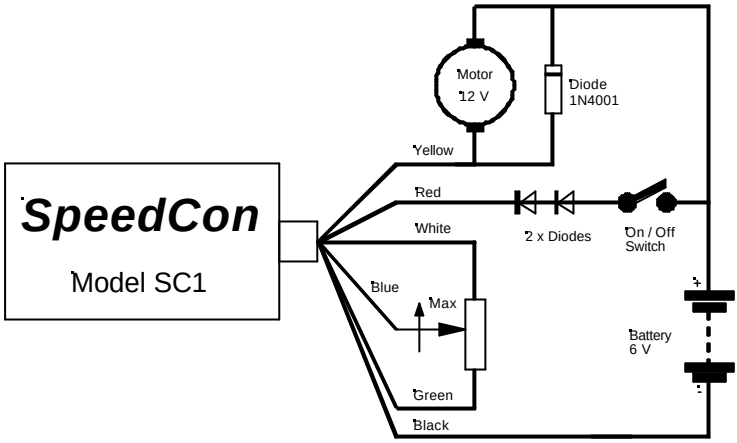
Circuit 1



Circuit 2



Circuit 3



Notes

1: The **minimum** supply voltage to the ***SpeedCon*** on the **Red** wire for correct circuit operation is **2.5 V**.

2: The **absolute maximum** supply voltage to the ***SpeedCon*** on the **Red** wire is **5.5 V**. Operation at higher voltages will cause irreparable damage.

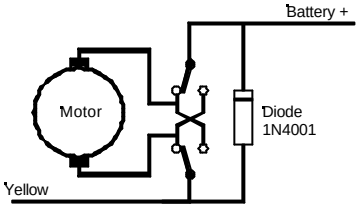
3: Make sure that the battery polarity is as shown. Reverse polarity supplies to the ***SpeedCon*** will cause irreparable damage.

4: For motors operating at more than 3V, the ***SpeedCon*** must be powered from a voltage not exceeding 5 V, nominal. Either **Circuit 1** or **Circuit 2** above may be used. For **Circuit 2**, the 3V ***SpeedCon*** supply may be derived from a low power source such as watch batteries, as the control circuit draws a current of only 1 mA.

5: For 6 V supplies only, **Circuit 3** above may be used. The two diodes in the **Red** wire to the **SC1** will drop its supply voltage to approximately 4.5 V, within permitted ratings. Any small signal diodes may be used, as the load current is only 1 mA..

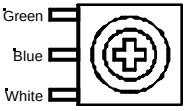
6: When split or multiple batteries are used, the **On/Off** switch should be placed in the **Red** lead to the ***SpeedCon***. A second switch in the motor supply is not required.

7: The flywheel diode, type 1N4001, must be connected across the motor with its **cathode**, marked by a **bar**, connected to the positive battery supply, irrespective of the motor polarity. This diode should be mounted close to the motor terminals. If motor reversing is required, the reversing switch must be connected as shown below.



8: With the circuits above, the speed set potentiometer will vary the motor voltage between 0V at **minimum** to the full battery voltage at **maximum**. If a lesser control range is required, fixed series resistors may be fitted at either end of the potentiometer.

9: The speed set potentiometer supplied should be wired as shown below, when viewed from above, for maximum motor voltage when set fully clockwise.



Other Products

Timpdon Electronics manufactures a wide range of specialist electronic control and flash units, including -

PhotoFlash	***WeldArc***	***SeaFlash***	***SpeedFlash***
LawFlash	***HazFlash***	***MorseFlash***	***FireGlow***
InertiaSim			

Ask for details.

Important Advice to Users

A number of users of the SC1 in the past three years have returned units claiming them to be faulty. In almost all cases the cause of the fault has been damage caused either by excessive supply voltage, reverse supply polarity or use with motor loads in excess of the rating of the unit.

SC1 units are 100% tested at maximum rated load prior to despatch.

***Timpdon Electronics* will not accept liability for damage caused to units by users incorrectly wiring these units or attempting to use then outside their published ratings.**

Supply Voltage

The SC1 must be operated on a supply voltage, connected between the **Red** and **Black** wires, of between 2.5 and 5.5 V. Operation at higher voltages will cause irreparable damage.

The unit may be used to power 12 V motors from a separate 12 V supply, but this voltage must not, in any circumstances, be applied to the control circuits of the unit.

Supply Voltage Polarity

In order to provide operation of the SC1 at supply voltages down to 2.5 V, it is not possible to provide reverse polarity protection on the unit.

The SC1 will be irreparably damaged if the supply voltage polarity connected between the **Red** and **Black** wires is reversed.

The connection polarity must be

Positive Supply	**Red** wire
Negative Polarity	**Black** wire

Power Rating

The SC1 is designed to drive motors with a continuous current rating of up to 1A at motor supply voltage up to 12 V.

Users must remember, however, that the current take by a stalled motor will be many times higher than its normal operating current.

The SC1 has a considerable safety margin, in terms of current, for short term overloads, but operation can not be guaranteed for significant periods of stalled motor operation at currents greater than 1A. The absolute maximum stalled motor current of any motor used on the SC1 must not exceed 4 A.

Users should be aware that the ratio of stalled motor current to normal operating current is usually highest on cheap imported motors.

It is the user's responsibility to ensure that any motor used with the SC1 will not cause its load rating to be exceeded