



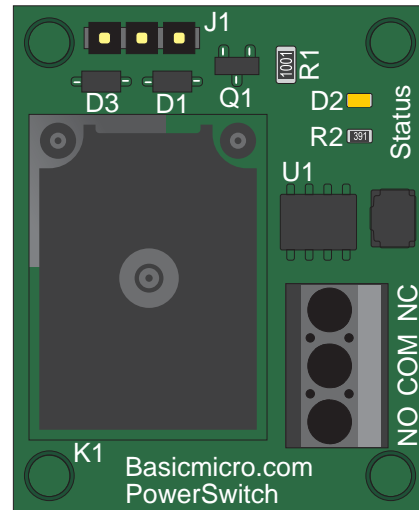
BASIC MICRO

TECHNOLOGY AT WORK

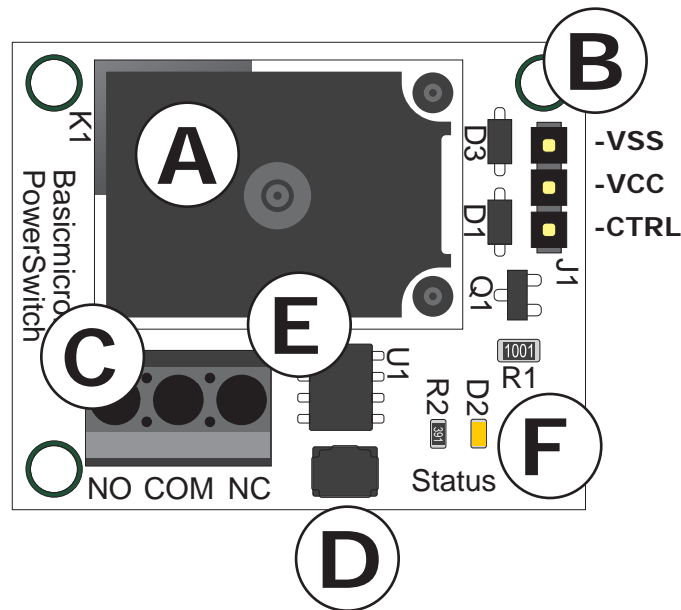
B0096 - Power Switch
Data Sheet

Feature Overview:

- 4 Control Modes
- Hobby RC Radio Compatible
- TTL Inputs
- Serial Input
- Can be Bussed
- Up to 16 Devices per I/O Pin
- Relay 125VDC at 10A

**Basic Description**

The Power Switch is a high power relay controlled via an onboard microcontroller. The Power Switch has 4 modes of input. The Power Switch can be controlled from a RC receiver, TTL, serial or a combination of TTL and RC modes. The Power Switch in serial mode can be bussed allowing several Power Switches to be controlled from one I/O pin. The modes can be changed at any time with the control button. The mode is saved and will be the default on power up.

Hardware Overview:

- A:** Relay 125VDC at 10A
- B:** Control header. VSS, VCC and CTRL
- C:** 3.5mm Screw Terminal. Normally Closed, Common and Normally Open
- D:** Mode Button
- E:** Microcontroller
- F:** Status LED

Pin Name Assignment Overview

Pin Name	Description
VSS	Ground (GND)
VCC	Regulated 5VDC input.
CTRL	Control pin. Bidirectional I/O. Baud i38400. (Pin is floating)
NO	Relay - Normal Open
COM	Relay - Common
NC	Relay - Normally Closed

Connections

The 3 pin header J1 is set up to be pin compatible with a standard servo connection. There is a small silk screen white bar indicating the VSS (GND) pin. The 3 pin cable is included and comes attached. You can remove this cable and use your own.

Setting Input Modes

Power Switch has 4 different control modes. This allows it to be controlled from several different devices ranging from hobby RC radios to microcontrollers.

Mode 1

Serial - Relay is activated from serial commands at a baud rate of 138400. Each Power Switch is addressable and can be bussed. Bussing the Power Switch allows one I/O pin to control several Power Switches at once.

Mode 2

R/C - Uses standard servo pulse to activate the relay. Commonly used when controlling a Power Switch from an R/C receiver. Servo pulses from 1.6ms to 2.5ms will turn the relay on. Servo pulses from .5ms to 1.5ms will turn the relay off.

Mode 3

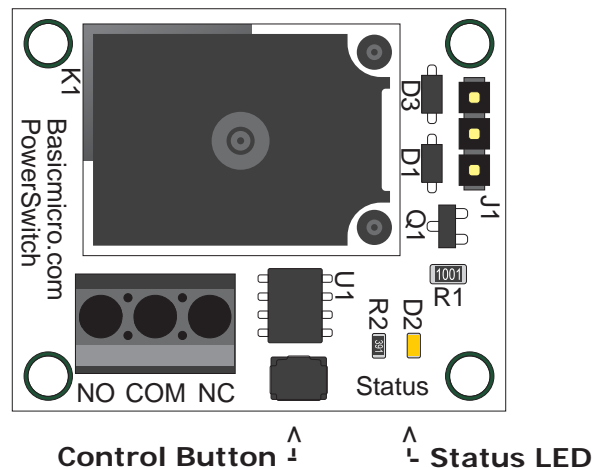
TTL - Uses High / Low input from microcontroller or other device to activate the relay. A voltage of 0.8VDC or greater will turn the relay on. There is no pull-up or pull-down on the input pin. This is due to the supported buss mode. It is considered a good practice to use either a pull-up or pull-down resistor in your circuit if using TTL mode.

Mode 4

TTL and RC - Mode 4 combines both TTL and RC modes. The same servo pulse range from mode 2 will activate the Power Switch or a TTL high from mode 3. This mode can be used when you are not sure what method the Power Switch will be driven with.

The input mode is set using the control button. You can change the mode at any time. The mode is saved and becomes the default on power up. You can use any regulated 5VDC source for power.

To set the desired mode, power up the device. The status LED will come on, then blink. You can count the blinks which indicate what mode the Power Switch was last set to. 1 blink = mode 1, 2 blinks = mode 2, 3 blinks = mode 3 and 4 blinks = mode 4. After changing a modes, the status LED will blink the number of times for the mode it is now in.



Serial Mode

Serial mode consists of a simple serial communication format. The baud rate is 38400 if you are using a digital I/O pin from a microcontroller. If a max232 circuit is used or the S_OUT pin of the BasicATOM or the baud mode will be non inverted (38400).

The sample code below demonstrates how to control the Power Switch. It will turn the relay on for one second then off for one second.

```
;Program will cycle relay in 1/2 second intervals.

Main
  Serout P0, i38400, ["#A1",13]
  Pause 1000
  Serout P0, i38400, ["#A0",13]
  Pause 1000
Goto Main
```

The "#" is used to tell the Power Switch to pay attention to the next command. The "A" is the default address for the Power Switch. "1" tells the Power Switch to turn the relay on. "0" tells the Power Switch to turn the relay off. 13 represents a carriage return and tells the Power Switch to execute the command. In buss mode you can send several strings to several devices and execute all of them at the same time by sending one carriage return (13).

Bussing Power Switch

You can run several Power Switches from one I/O pin. Each Power Switch is addressable and ships with the same default address "A". In order to buss the Power Switch you will need to connect each one individually and set its address to something unique. The address range is anything from 0 to 255. The simplest method is to use a character such as A to Z. The following code will set the address using an BasicATOM, BasicATOM Pro or Nano with Basic Micro Studio terminal window.

```
;Reprograms the address of any Basic Micro serial device.

Temp Var Byte

Main
  Pause 500
  Serout s_out, i9600, ["Input New Address A to Z: "]
  Serin s_in, i9600, [Temp]
  serout s_out, i9600, [13, "Setting New Address to: ", Temp]
  Pause 100
  Serout P0, i38400, ["#", Temp, "S"]
  Pause 1000 ;Need time to save the new address
  Gosub Test
Goto Main

Test
  Serout s_out, i9600, [13, "Testing Address: ", Temp, 13, 13]
  Serout P0, i38400, ["#", Temp, "1",13]
  Pause 500
  Serout P0, i38400, ["#", Temp, "0",13]
  Pause 500
Return
```

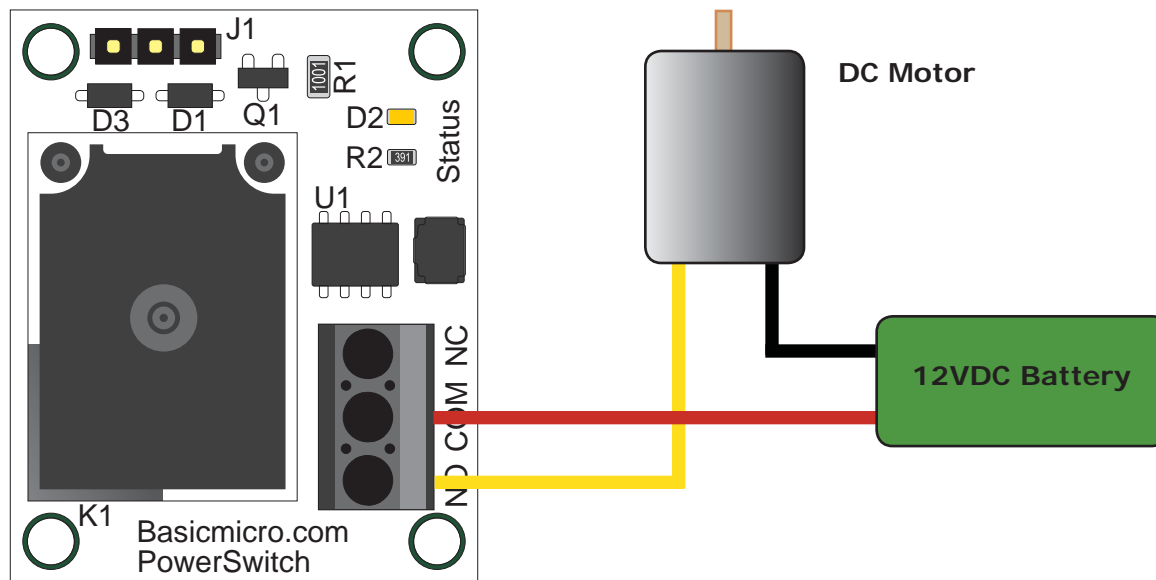
Wiring the Relay

The relay is wired using the 3.5mm screw terminals. The screw terminals are labeled with the following abbreviations:

NC = Normally Closed
 COM = Common
 NO = Normally Open

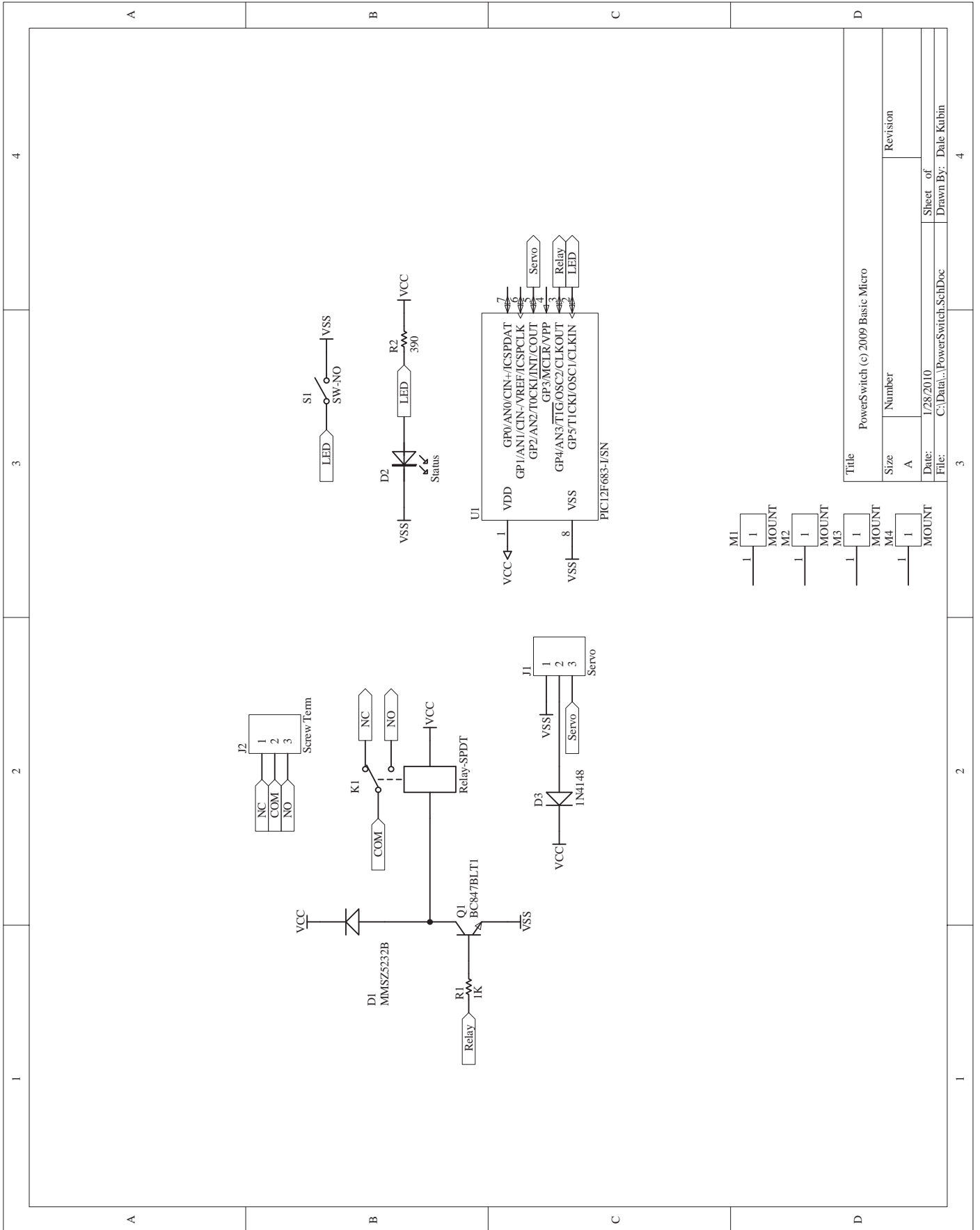
Normally open means connection from NO to COM will be open and not conduct when the relay is in an off state. Once the relay is activated the circuit will be come closed and conduct. Normally closed is the opposite. When the relay is off normally closed (NC) and common (COM) will conduct. The circuit will break and not conduct when the relay is activated.

Common (COM) can be ground (-) or positive (+) side to your circuit. The example below controls the positive (+) terminal of a DC motor. When the relay is activated the motor will spin.



Important Notes

1. RevA Power Switch boards have the NO and NC reversed. Compare the Power Switch you have to the illustrations in this data sheet. The illustrations shown are the correct order.
2. RC receiver mode. The relay requires a specific current to energize. If the RC receiver batteries are low they may allow the receiver to operate but not have enough power to switch the relay.



Electrical Characteristics

Characteristic	Value (Units)
VCC Range (min - max)	4 - 6VDC
Current Draw (Idle)	20 mA
Relay Current Draw (maximum)	50 mA
Relay Contacts (maximum)	125VDC at 10A
I/O Voltages (Low / High)	0.0 V / 5.0V
I/O Logic	TTL
Tempature Range	-40 to +125 C

Warranty

Basic Micro warrants its products against defects in material and workmanship for a period of 90 days. If a defect is discovered, Basic Micro will, at our discretion, repair, replace, or refund the purchase price of the product in question. Contact us at support@basicmicro.com. No returns will be accepted without the proper authorization.

Copyrights and Trademarks

Copyright© 2010 by Basic Micro, Inc. All rights reserved. PICmicro® is a trademark of Microchip Technology, Inc. The Basic Atom and Basic Micro are registered trademarks of Basic Micro Inc. Other trademarks mentioned are registered trademarks of their respective holders.

Disclaimer

Basic Micro cannot be held responsible for any incidental, or consequential damages resulting from use of products manufactured or sold by Basic Micro or its distributors. No products from Basic Micro should be used in any medical devices and/or medical situations. No product should be used in a life support situation.

Contacts

Email: sales@basicmicro.com
Tech support: support@basicmicro.com
Web: <http://www.basicmicro.com>

Discussion List

A web based discussion board is maintained at <http://www.basicmicro.com>.

Technical Support

Technical support is made available by sending an email to support@basicmicro.com. All email will be answered within 48 hours. All general syntax and programming questions, unless deemed to be a software issue, will be referred to the on-line discussion forums.