



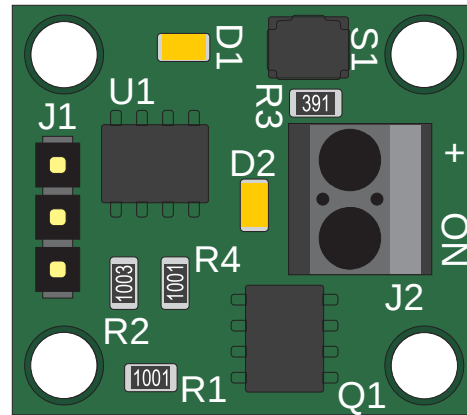
BASIC MICRO

TECHNOLOGY AT WORK

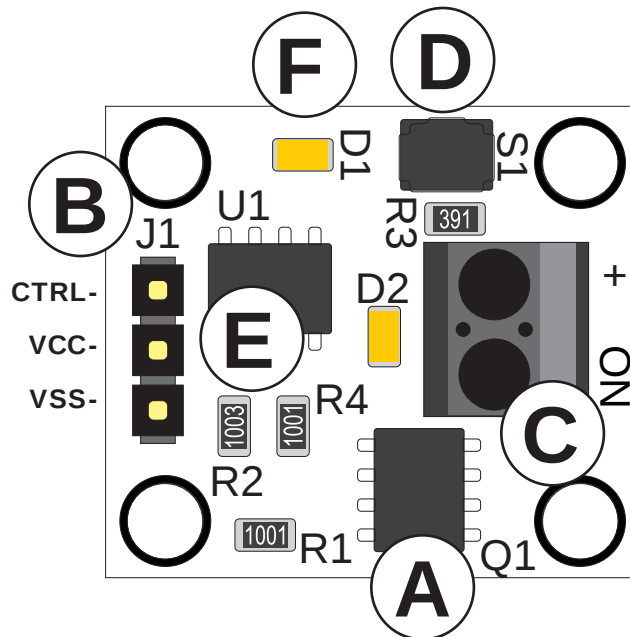
B0089 - Bit Switch
Data Sheet

Feature Overview:

- 4 Control Modes
- Hobby RC Radio Compatible
- TTL Inputs
- Serial Input
- Can be Bussed
- Up to 16 Devices per I/O Pin
- MOSFET 24VDC at 3Amp

**Basic Description**

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

Hardware Overview:

- A:** MOSFET 24VDC at 3Amp
- B:** Control header. VSS, VCC and CTRL
- C:** 3.5mm Screw Terminal. Normally Opened and voltage in.
- 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	MOSFET - Normal Open
+	MOSFET - Positive Common

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

The Bit 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 - MOSFET is activated from serial commands at a baud rate of 115200. Each Bit Switch is addressable and can be bussed. Bussing the Bit Switch allows one I/O pin to control several Bit Switches at once.

Mode 2

RC - Uses standard servo pulse from a hobby RC receiver to activate the MOSFET. Servo pulses from 1.6ms to 2.5ms will turn the FET on. Servo pulses from .5ms to 1.5ms will turn the FET off.

Mode 3

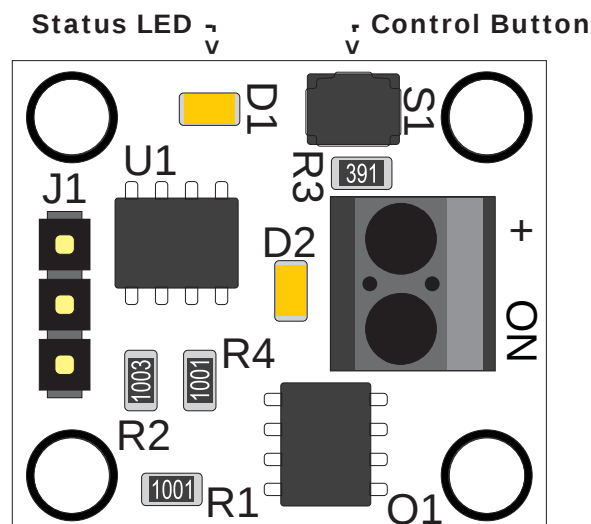
TTL - Uses simple High / Low input from microcontroller or other device to activate the MOSFET. A voltage of 0.8VDC or greater will turn the MOSFET on. There is no pull-up or pull-down on the input pin. This is due to the supported buss mode. It is considered a good practice to use either a pull-up or 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 Bit Switch or a TTL high from mode 3. This mode can be used when your not sure what method the Bit 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 using a digital I/O pin from a microcontroller. If you are using 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 Bit Switch. It will turn the MOSFET on for one second then off for one second.

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

```
Main
  Serout P0, i38400, ["#A1",13]
  Pause 500
  Serout P0, i38400, ["#A0",13]
  Pause 500
Goto Main
```

The “#” is used to tell the Bit Switch to pay attention to the next commands. The “A” is the default address for the Bit Switch. “1” tells the Bit Switch to turn the relay on. “0” tells the Bit Switch to turn the MOSFET off. 13 represents a carriage return and tells the Bit 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 send one carriage return (13).

Bussing Bit Switch

You can control multiple Bit Switches from one I/O pin. Each Bit Switch is addressable and ships with the same default address “A”. In order to buss the Bit 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
```

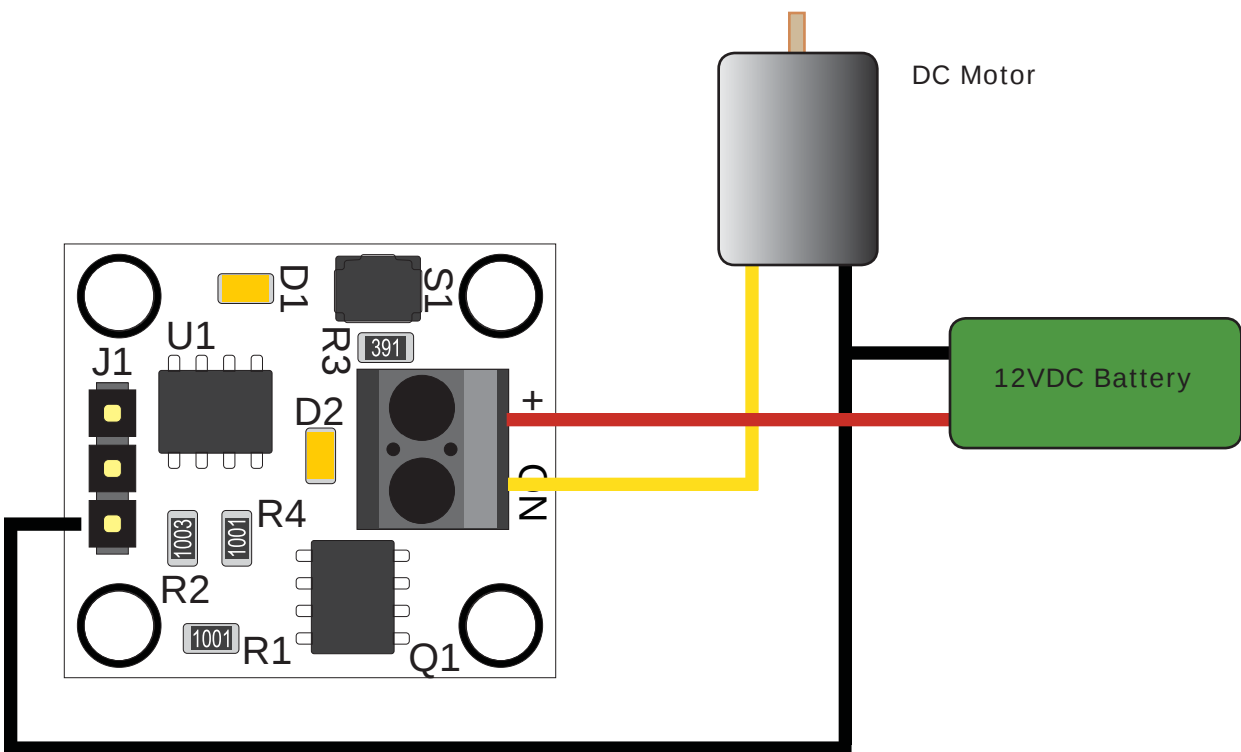
Bit Switch Wiring

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

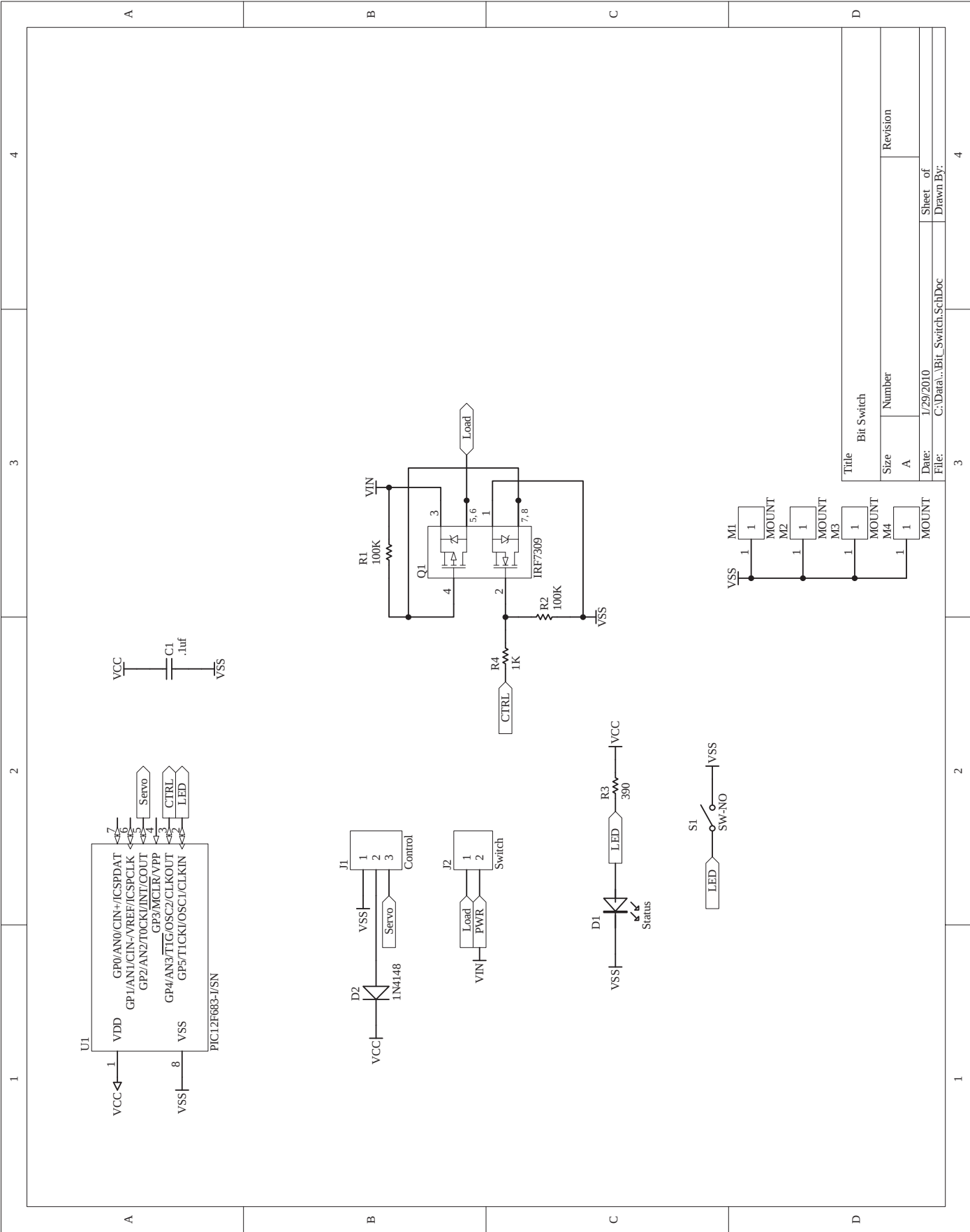
+ = Positive Common
NO = Normally Open

Normally opens (NO) means no connection when the MOSFET is in an off state. Once the MOSFET is activated the circuit will become closed and conduct.

The + side of the screw terminal is the positive DC input. Connect the positive side of your power source such as a battery to the screw terminal labeled +. The example below controls a DC motor. When the MOSFET is activated the motor will spin.

**Important Notes**

1. The Bit Switch requires a shared ground with your circuit. The MOSFET switch will not function properly if there is no common ground.



Electrical Characteristics

Characteristic	Value (Units)
VCC Range (min - max)	4 - 6VDC
Current Draw (Idle)	10 mA
Current Draw (maximum)	20 mA
MOSFET Contacts Current (maximum)	24VDC at 3Amp
I / O Voltages (Low / High)	0.0 V / 5.0V
I / O Logic	TTL
Tempature Range	-40 to +125 C

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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.