



TOSR-0X

USB/Wireless Relay Module

User Manual



Tinyos Electronics @ 2013

Version 1.3

INTRODUCTION

This USB/Wireless Relay Module allows computer control switching of external devices by using the USB port of your computer!

Meanwhile, It has a wireless extension port, can work with XBEE or Bluetooth Bee or Wifly Module, which mean now you can control your device by zigbee or Bluetooth or WiFi !

The TOSR04 module can powered by USB bus or DC power and provides four volt free contact relay outputs with a current rating of up to 10 Amp each.

We have three kinds USB/Wireless Relay Modules(2/4/8 channel).Here we use 4 channel module for demo.

SPECIFICATIONS

- Number of Relays:2/4/8
- Rated voltage:DC 5V
- Relay switching power:10A 250VAC
- Baud rate:9600
- Communication Port:USB/Wireless
- Support Xbee/Bluetooth/WiFi Control
- Supply voltage:USB powered or 5V DC*

*If you use 8 Channel USB relay module you must use a DC5V power supply

IMPORTANT DISCLAIMER

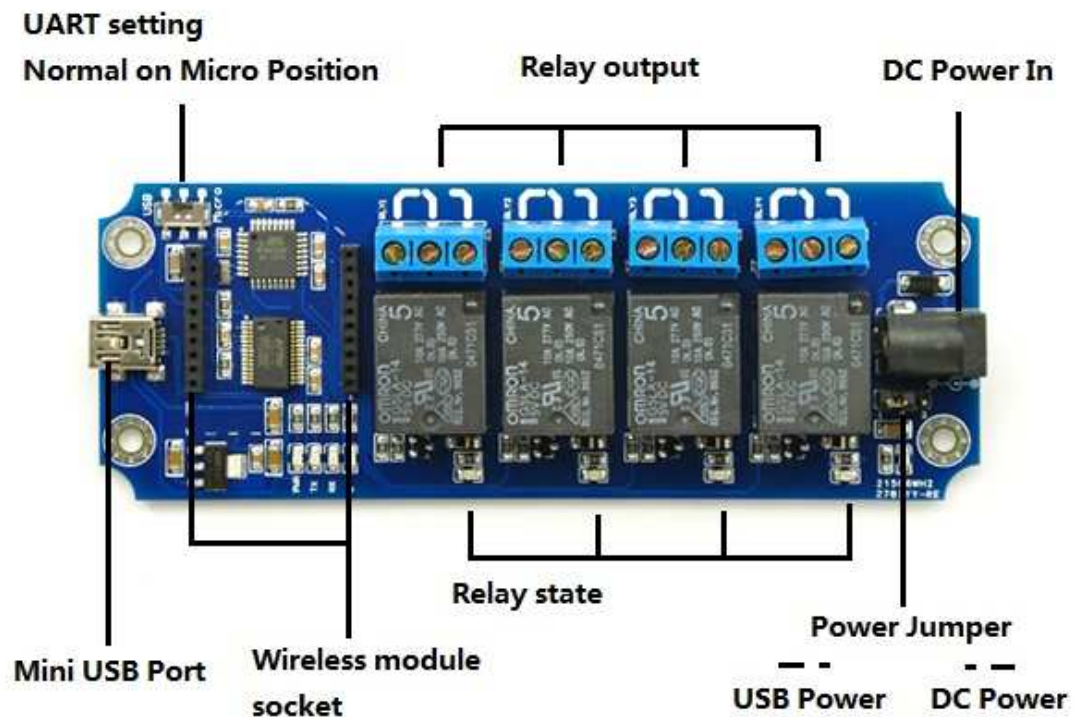
This device connects to the USB port of your computer and can be used to control external devices connected to its onboard relays. Incorrect wiring or shorts on the board can potentially cause damage to the controller itself,your computer's USB controller and/or your computer's motherboard if an external voltage make its way to the USB bus or the USB port is shorted. Extreme care must be taken when using this device to avoid any damage to your equipment. In particular,make sure you always disconnect the device from the USB port as well as any other power source when working on the device.

Tinyos Electronics,it's shareholder,employees,suppliers,distributors and/or resellers are not liable for any damage or loss of data as a result of the use of this device, including special,incidental,or consequential damages resulting from the use of this device,or under any legal theory,including lost profits,downtime,goodwill,damage to or replacement of equipment or property,and any costs or recovering or reproducing any data stored in

computers connected to this device.

Your use of this circuit indicates your acceptance of these terms

Module Overview



Commands

This module operates with an easy to use command set as described in the table below.

Command			Action
dec	hex	ASCII	
90	5A	Z	Get software version - returns 2 bytes, the first being the Module ID which is 15, followed by the software version
91	5B	[	Get relay states - sends a single byte back to the controller, bit high meaning the corresponding relay is in position 1
93	5D	]	Get DC input voltage - returns the supply voltage as byte, this is fixed at 50 meaning 5.0V DC
100	64	d	All relays to position 1
101	65	e	Relay 1 to position 1
102	66	f	Relay 2 to position 1
103	67	g	Relay 3 to position 1
104	68	h	Relay 4 to position 1
105	69	i	Relay 5 to position 1
106	6A	j	Relay 6 to position 1
107	6B	k	Relay 7 to position 1
108	6C	l	Relay 8 to position 1
110	6E	n	All relays to position 0
111	6F	o	Relay 1 to position 0
112	70	p	Relay 2 to position 0
113	71	q	Relay 3 to position 0
114	72	r	Relay 4 to position 0
115	73	s	Relay 5 to position 0
116	74	t	Relay 6 to position 0
117	75	u	Relay 7 to position 0
118	76	v	Relay 8 to position 0

How to use

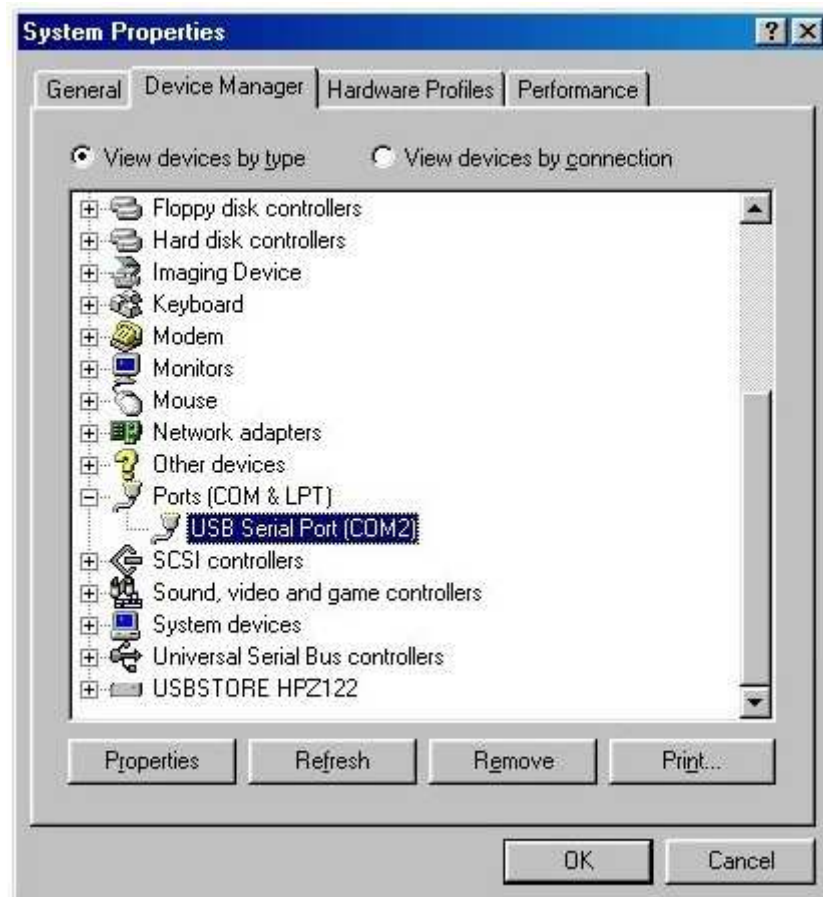
USB Control Mode:

Step1:Install the Driver

This module uses FT232RL USB to UART chip . Before using it you will need to download the [FT232RL Driver](#).

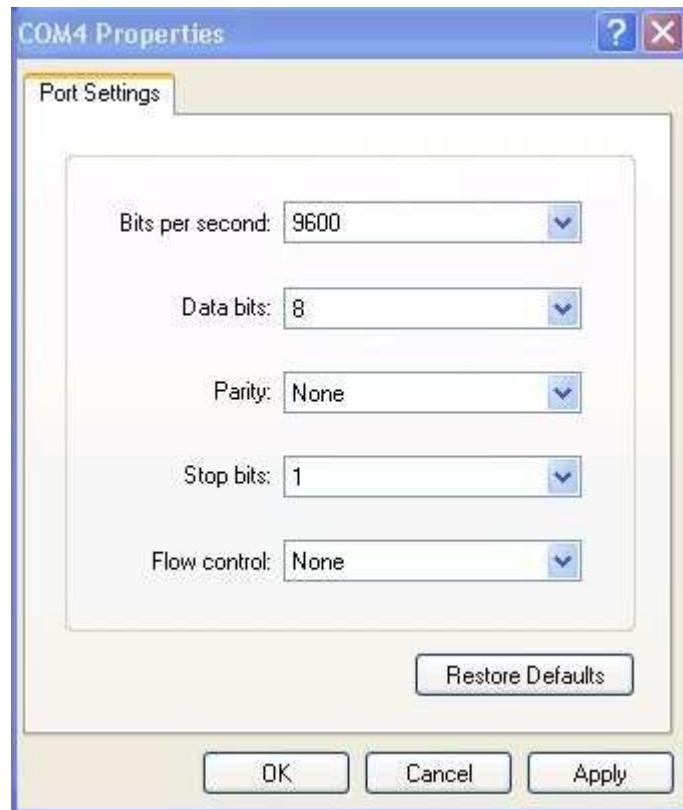
Connect the module to computer and windows will detect it and ask for the drivers. Point windows to the inf folder and it will install the driver.

A new com port will now appear.

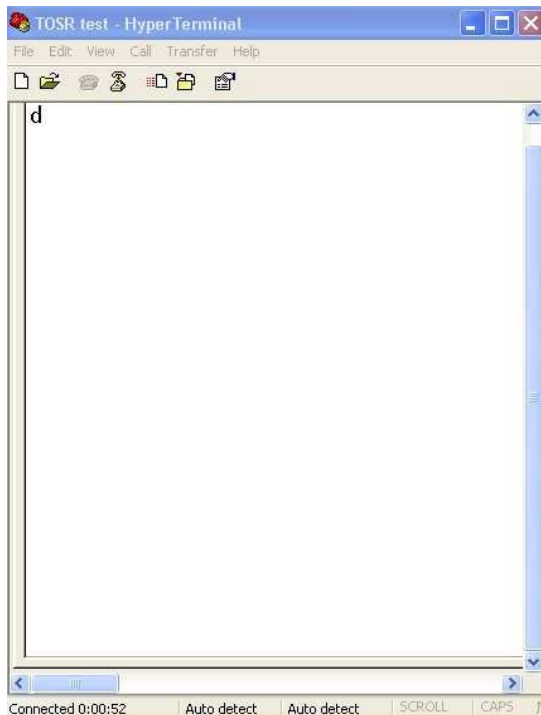


Step2:Run HyperTerminal

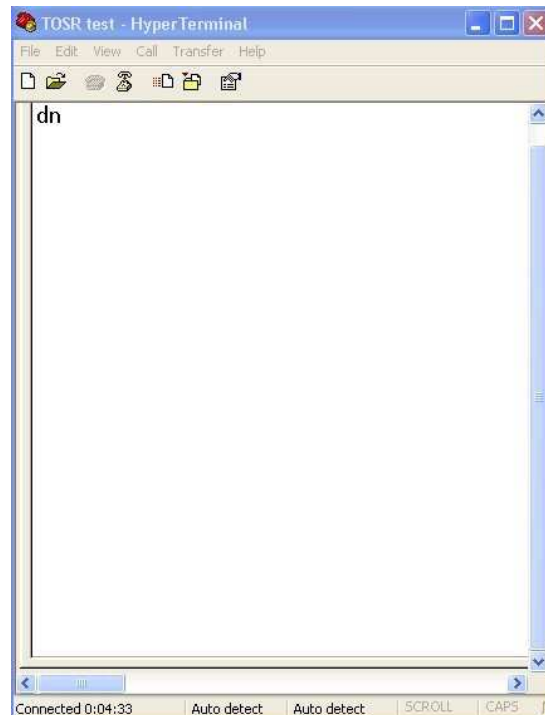
The TOSR relay module is controlled using serial command. We use HyperTerminal provided with Windows, but your favorite terminal should work fine. Be sure to set the communication speed to 9600 8-N-1 and **disable** Flow control. Connect the module to computer with USB cable, open the port and send test command you will see the relay on or off.



COM Port Setting



Send ASCII 'd' -> All relay on

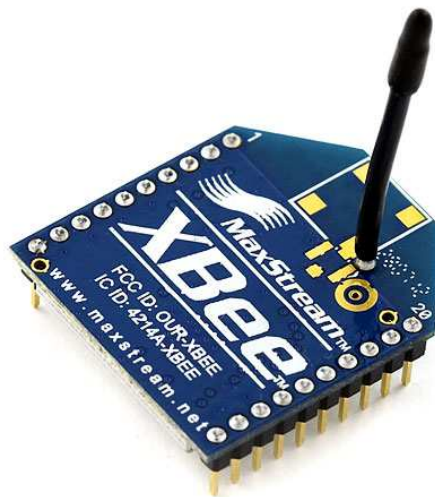


Send ASCII 'n' -> All relay off

Wireless Control Mode:

Xbee Remote Control

Xbee module is a kind of very popular 2.4G module from Digi (formally Maxstream). These module allow a very reliable and simple communication between microcontroller, computer, systems, really anything with a serial port! Here we use Xbee S1 module for demo. These modules take the 802.15.4 stack (the basis for Zigbee) and wrap it into a simple to use serial command set. Point to point and multi-point networks are supported. If you want building a mesh network, you can choose a S2 series module.

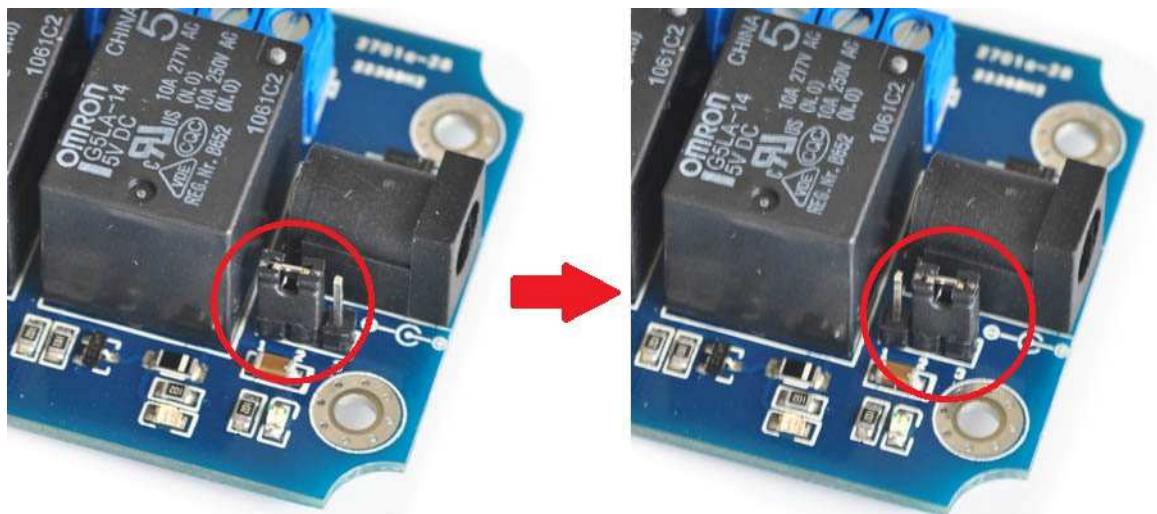


Step1: Plug Xbee to TOSR relay module

Plug Xbee module to TOSR relay module and make sure UART setting switch on 'Micro' position.



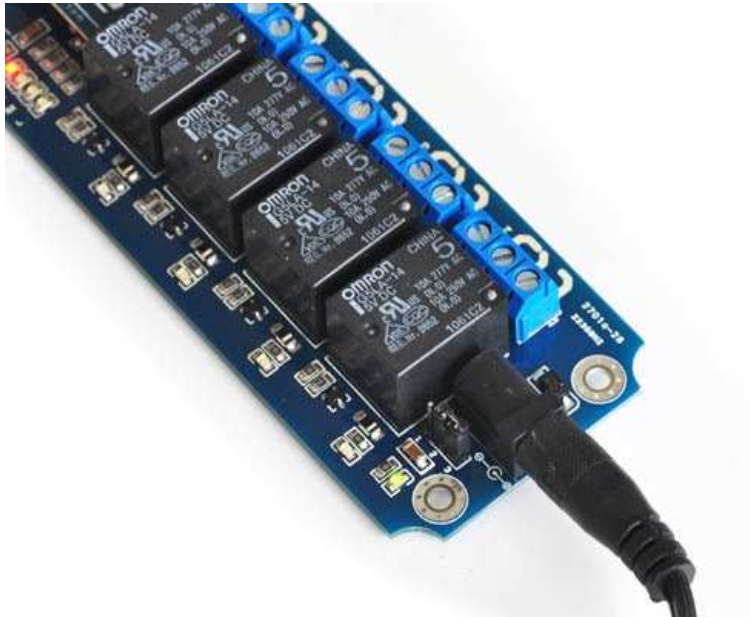
Step2: Set Power jumper to DC power mode



USB power to DC power mode

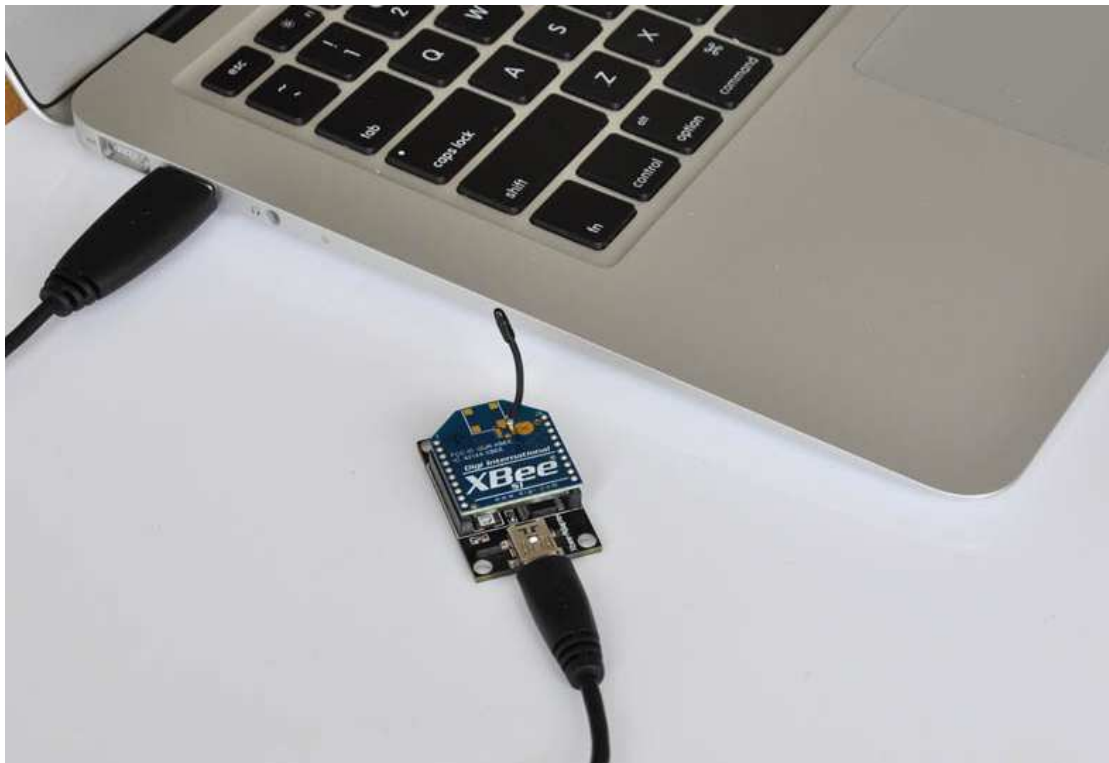
Here we use remote control. We can't provide power by USB port in this situation in the most time.

So, we need set the power jumper to DC power mode, and then power the module by DC 5V power supply.



DC 5V power supply

Step3: Plug another Xbee to USB adapter

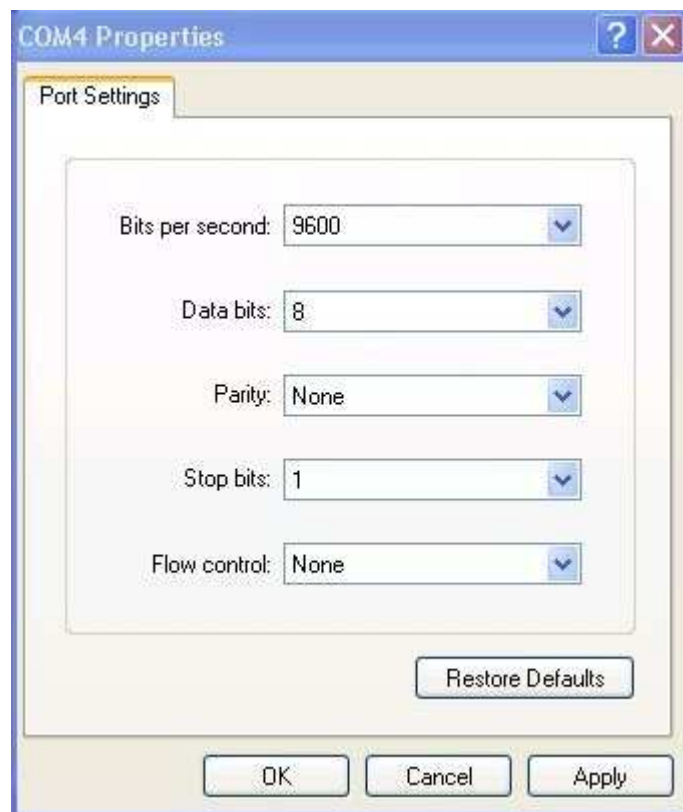


When connect your Xbee USB adapter to your computer USB port. Windows will detect it and ask for the drivers. Point windows to the FT232RL driver folder and it will install the driver. A new com port will now appear.

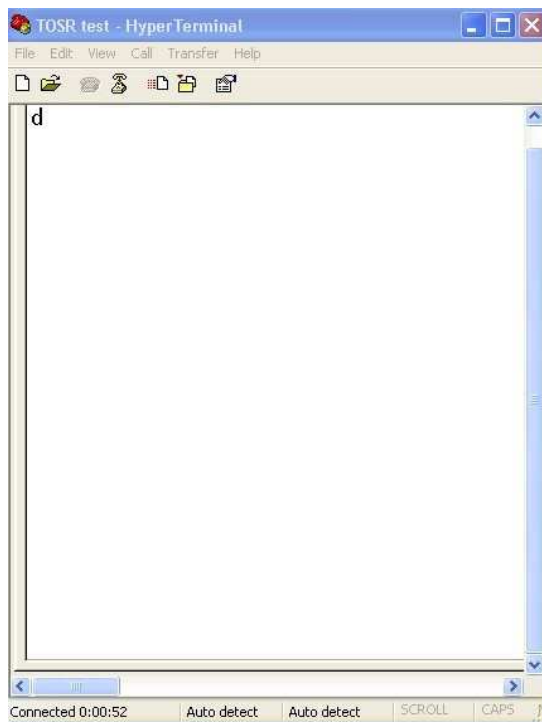
Step4: Send command

Just use Hyper Terminal I same as connected with USB cable directly. Send test

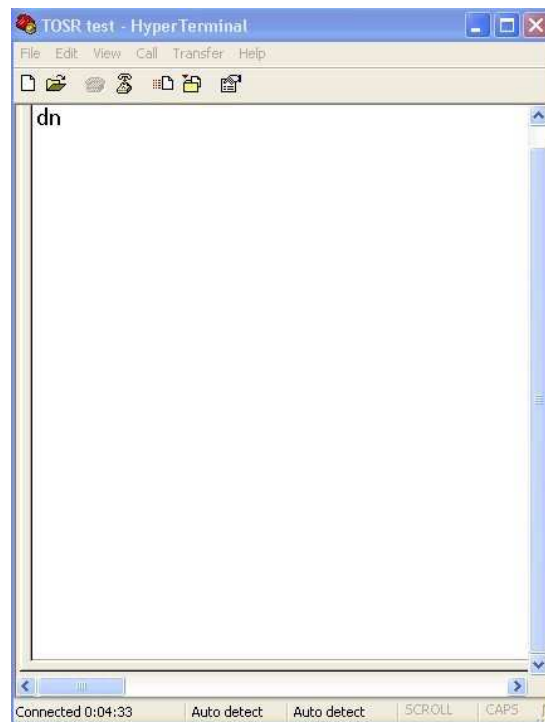
command and the relay will be on or off.



COM Port Setting



Send ASCII 'd' -> All relay on



Send ASCII 'n' -> All relay off

Bluetooth Remote Control

The Tinyos Bluetooth Bee is a Bluetooth wireless module Based on CSR BC417143 Bluetooth chipset. It has compact size and the pinout is compatible with XBEE which is suitable for all kinds of microcontroller systems who have 3.3V power out, the module can use the AT commands to set baud rate. The Bluetooth Bee module comes with an onboard antenna, the antenna provides better signal quality. It acts like a transparent serial port, which works with a variety of Bluetooth adapter and Bluetooth phone.

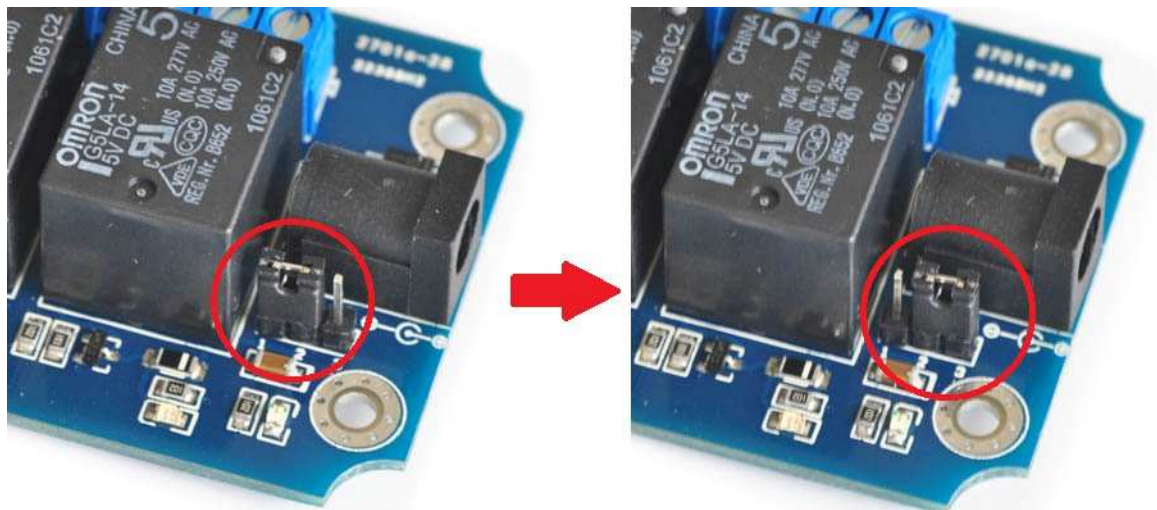


Step1: Plug Bluetooth Bee to TOSR relay module

Plug Bluetooth Bee module to TOSR relay module and make sure UART setting switch on 'Micro' position.



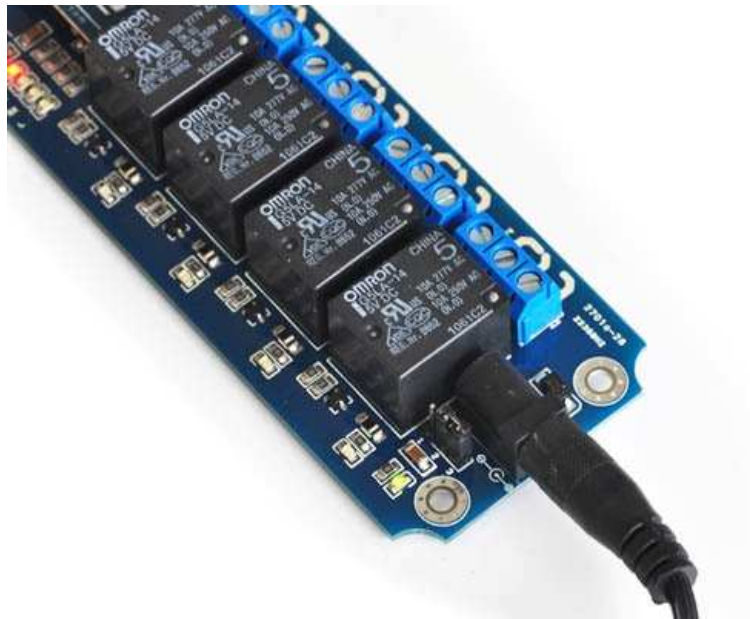
Step2: Set Power jumper to DC power mode



USB power to DC power mode

Here we use remote control. We can't provide power by USB port in this situation in the most time.

So, we need set the power jumper to DC power mode, and then power the module by DC 5V power supply.



DC 5V power supply

Controlled by computer

If your computer does not support bluetooth, you may need a bluetooth USB dongle like this:

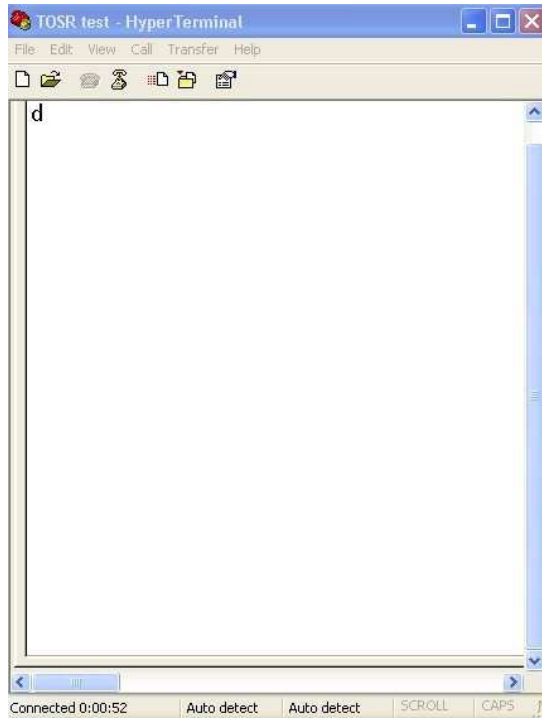


If your Windows Bluetooth drivers can't use, you need to download [BlueSoleil](#) to use.

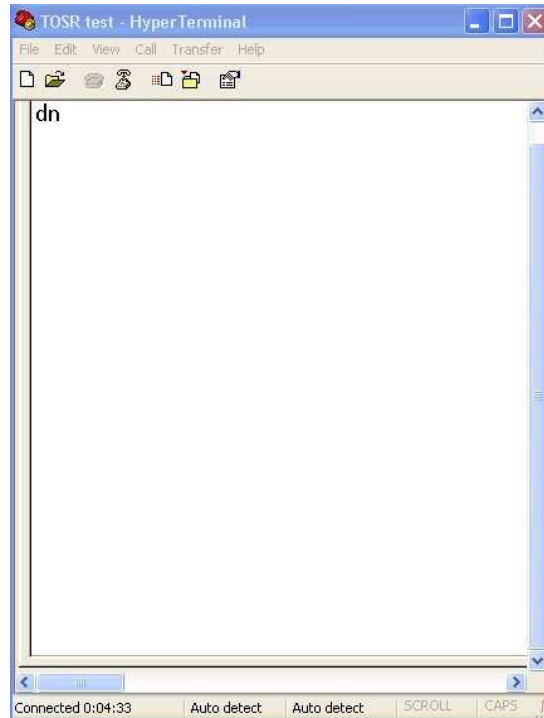
If your computer already has Bluetooth, just skip this step.

Connect with BluetoothBee and the default Pair number is [1234](#).

Then you can use the Bluetooth link command port by Hyper Terminal and send test command.



Send ASCII 'd' -> All relay on



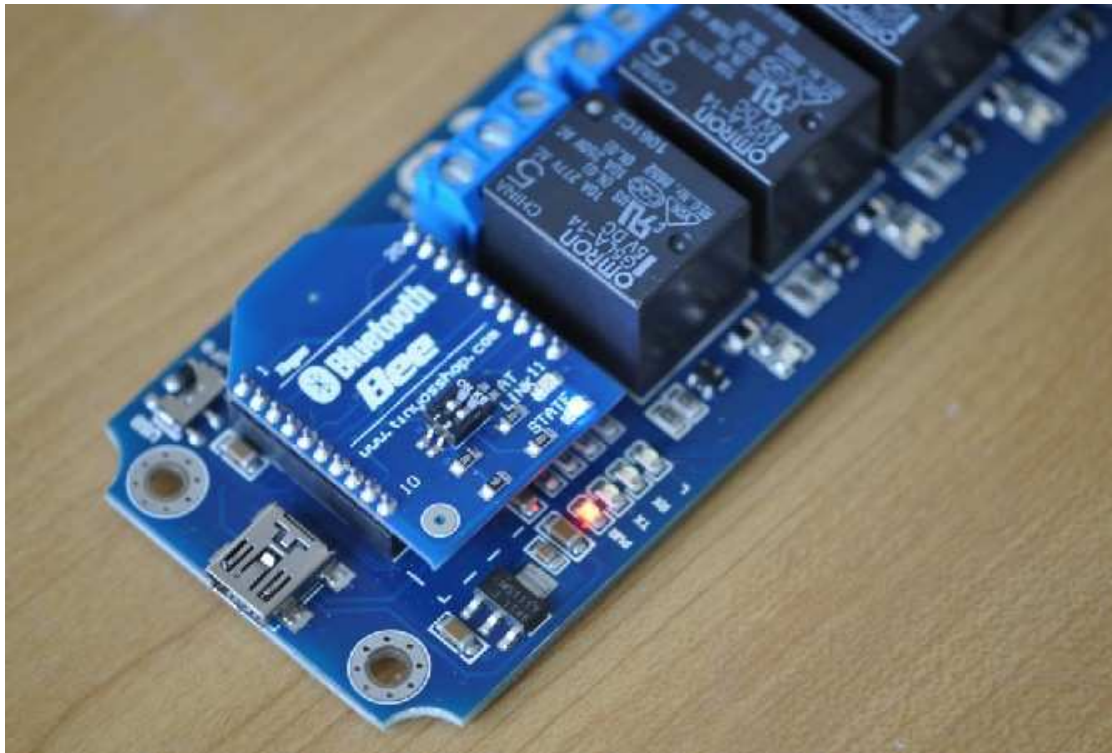
Send ASCII 'n' -> All relay off

Controlled by mobile phone

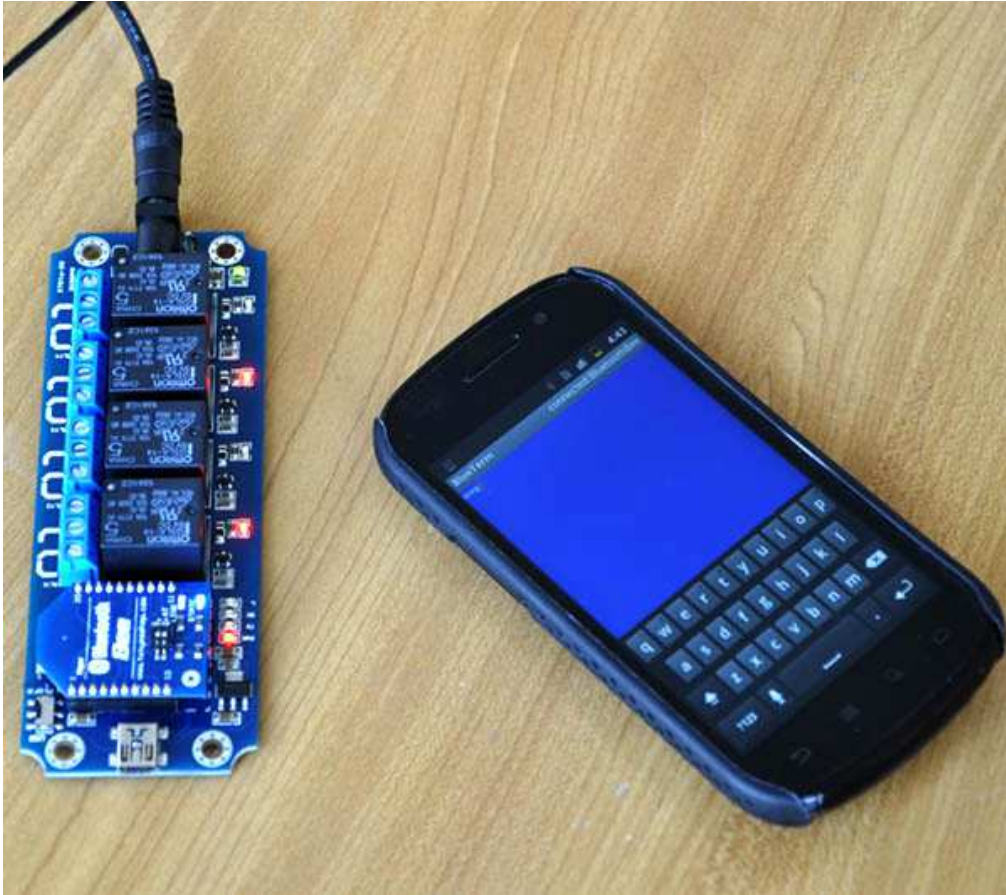
Here we test it use a android mobile phone. First, you need to install an application like [BlueTerm](#) .It's a free application on Google Play.



Connect device->select BluetoothBee->then you will find BluetoothBee blue STATE LED turn ON.

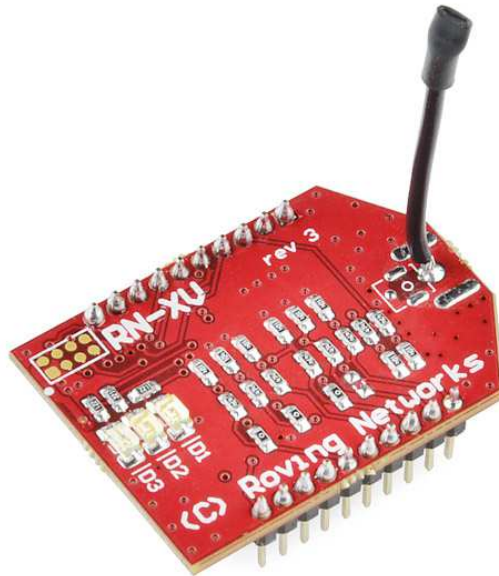


Send ASCII command '-d' turn all relays on
Send ASCII command '-n' turn all relays off



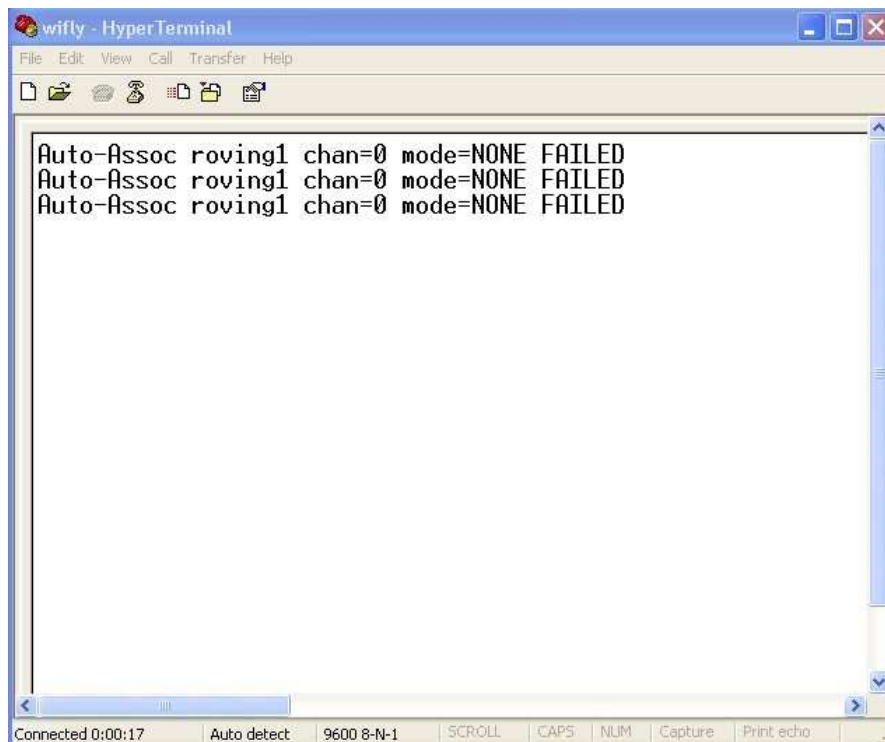
WIFI Remote Control

The RN-XV WiFly WiFi module is based upon Roving Networks' robust RN-171 Wi-Fi module and incorporates 802.11 b/g radio, 32 bit processor, TCP/IP stack, real-time clock, crypto accelerator, power management unit and analog sensor interface. The module is pre-loaded with Roving firmware to simplify integration and minimize development time of your application. In the simplest configuration, the hardware only requires four connections (PWR, TX, RX and GND) to create a wireless data connection.



Step1: Configuring wifly module

First, we need configuring the wifly module. Plug your wifly module to Xbee USB adapter. With your module plugged into USB, open up the port in HyperTerminal. You may see some data from the unit or a status message (it's ok if you don't see it).



Type \$\$\$ (without hitting return) to enter command mode. Now you can setup the module's wifi settings (hit return after each command):

```
set wlan phrase <your wpa password>
set wlan ssid <your ssid>
```

save
reboot

The module will power-cycle and the green status LED will start blinking. After 5-10 seconds it should start blinking more slowly, which indicates that it has successfully connected to your WiFi network. If your terminal session is still open, you should see a status message that indicates its success and its IP address (which you'll need soon).

```

CMD
set wlan phrase 0000000000
AOK
<2.32> set wlan ssid Tinyos3f
AOK
<2.32> save
Storing in config
<2.32> reboot
*Reboot*WiFly Ver 2.32, 02-13-2012 on RN-171
MAC Addr=00:06:66:72:4d:9f
Auto-Assoc Tinyos3f chan=12 mode=WPA1 SCAN OK
Joining Tinyos3f now..
*READY*
Associated!
DHCP: Start
DHCP in 520ms, lease=7200s
IF=UP
DHCP=ON
IP=192.168.1.105:2000
NM=255.255.255.0
GW=192.168.1.1
Listen on 2000
  
```

*Our test network ssid is Tinyos3f. Wlan phrase is 0000000000

Because it outputs status messages when the module starts. It may cause the relay action.

So you may need to set the module to silent mode. Here is the command:

set sys printlvl 0
save
reboot

And if you want a fixed IP address. Here is the command:

set ip a <your IP>
set ip dhcp 0
save
reboot

If we use a smart phone APP to control this relay module. When the phone out of WIFI signal area may cause dead connection. We need to closing the TCP connection in this situation. Here is the setting command. It's important.

[set comm idle 5](#)

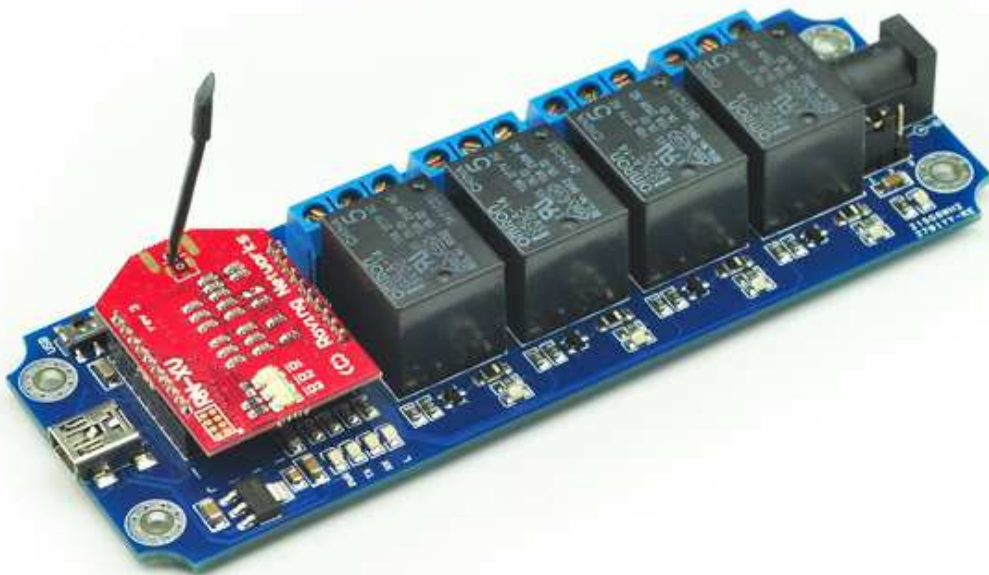
[save](#)

[reboot](#)

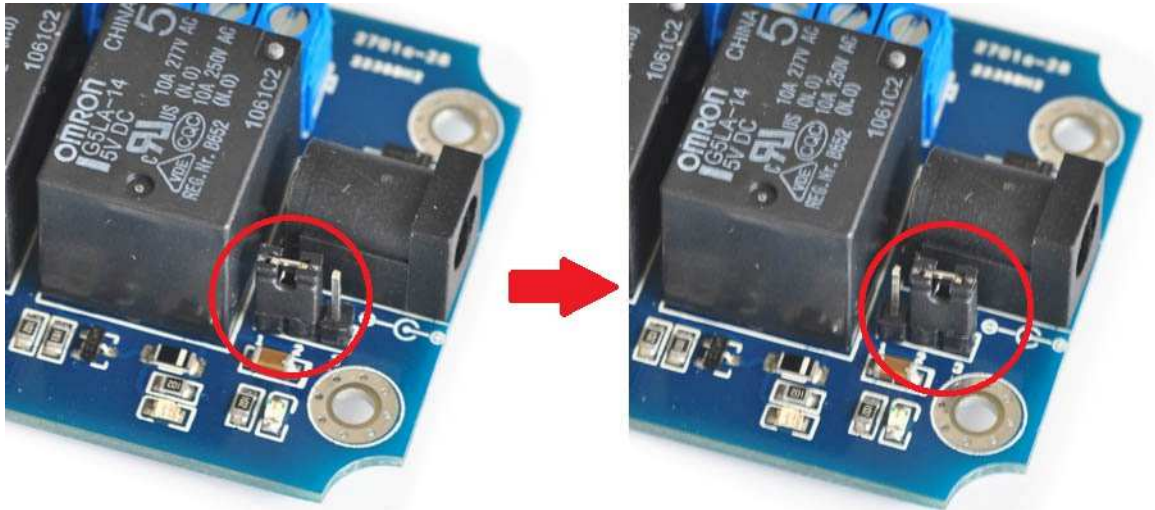
More details about wifly module please download the user manual in our webstore.

Step2: Plug WiFly to TOSR relay module

Plug WiFly WIFI module to TOSR relay module and make sure UART setting switch on 'Micro' position.



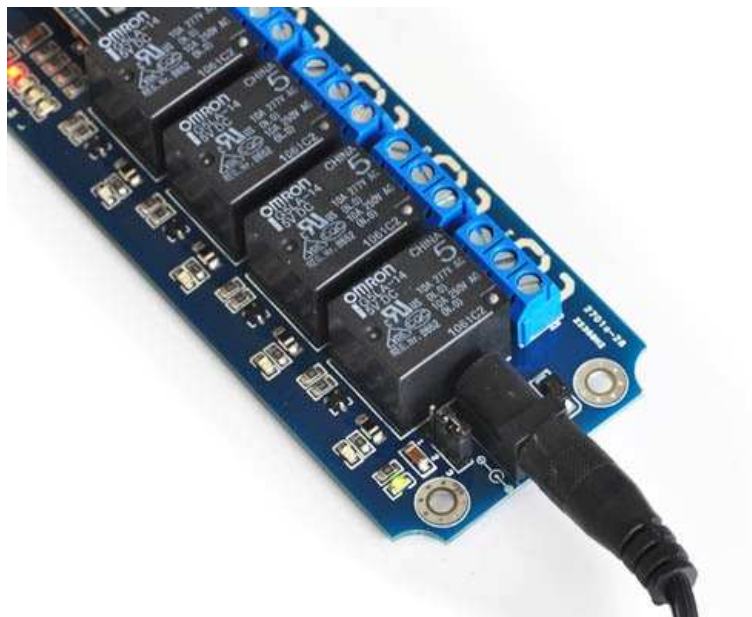
Step3: Set Power jumper to DC power mode



USB power to DC power mode

Here we use remote control. We can't provide power by USB port in this situation in the most time.

So, we need set the power jumper to DC power mode, and then power the module by DC 5V power supply.

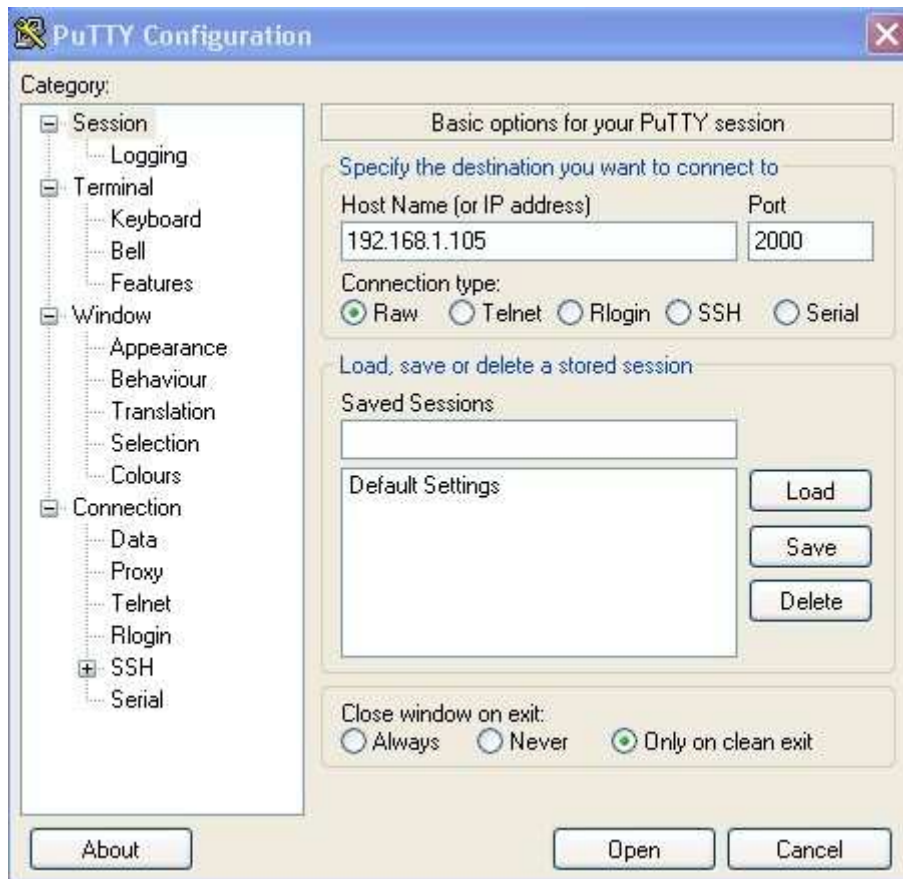


DC 5V power supply

Step4: Send test command

Controlled by computer

You can send a test command by **Putty** program.



Send ASCII command 'd' -> All relays on

Controlled by mobile phone

Here we test it use a iphone mobile phone. First, you need to install an application like **WiSnap**. It's a free application on AppStore.



WiSnap Setup Plus

Version: 1.0.6

Setup WiSnap on WLAN

Wireless Terminal

Click Wireless Terminal and connect wifly module, then you can send test command to control the relay module.

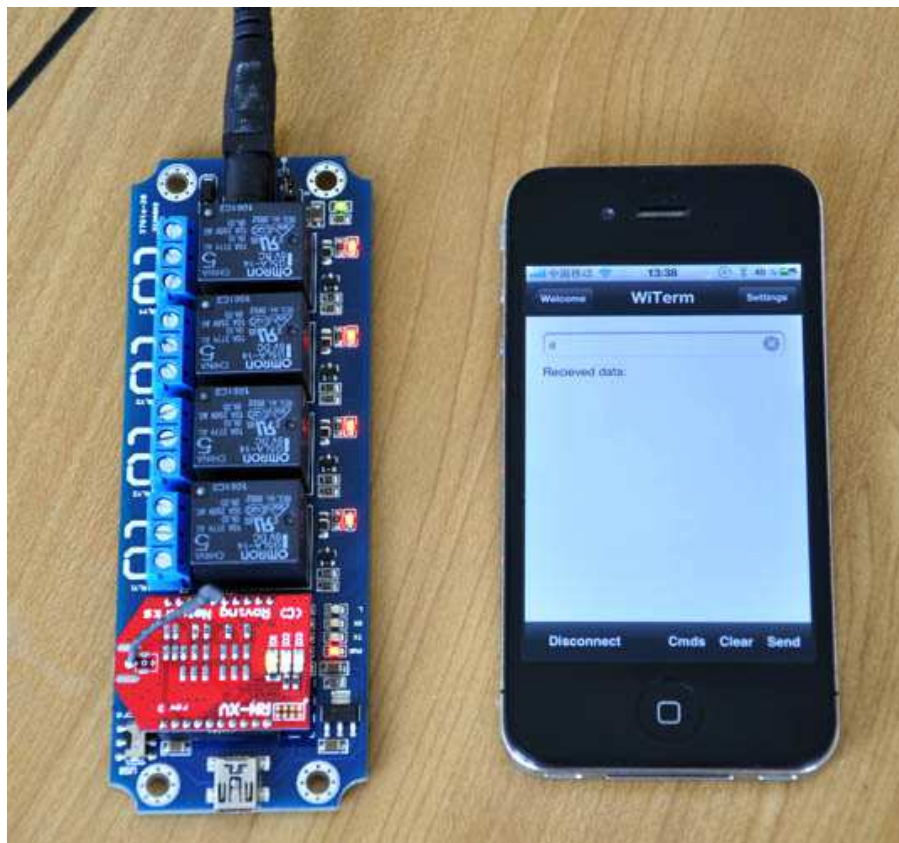


Recieved data:

Recieved data:



Send ASCII command '-d' turn all relays on
Send ASCII command '-n' turn all relays off



By now, these 3 examples are successfully finished. In theory, it also can be controlled under IOS system(Iphone) or android system via WIFI and Bluetooth, just test it by yourself! And welcome to communicate with our engineer!