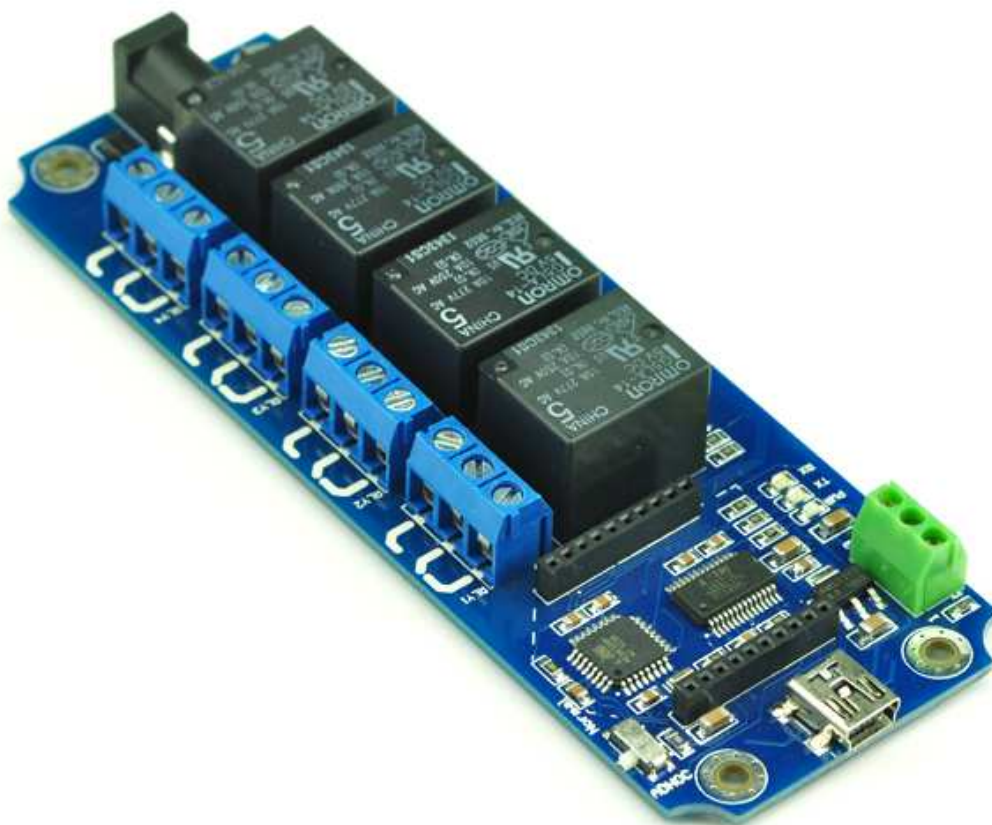**TOSR0X-T**

USB/Wireless Relay Module

User Manual

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-T module can be 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. It also has a DS18B20 temperature sensor port. You can use it make your thermostat or any other similar application by yourself.

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
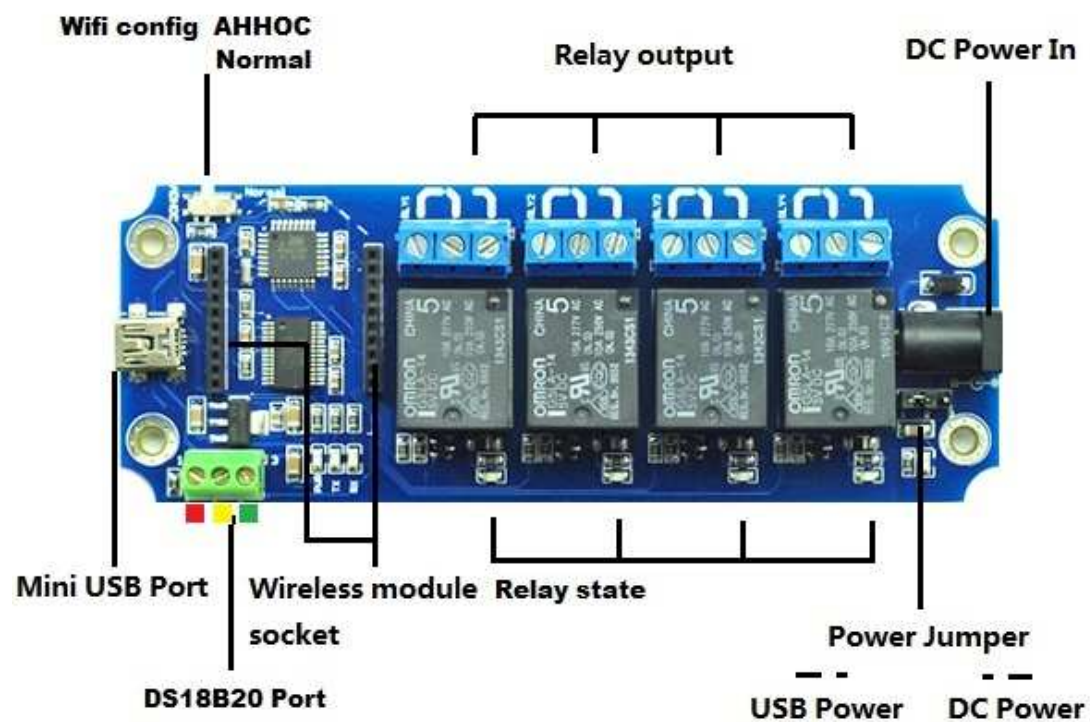
IMPORTANT DISCLAIMER

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.

Tinysine 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

Module Overview

Commands

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

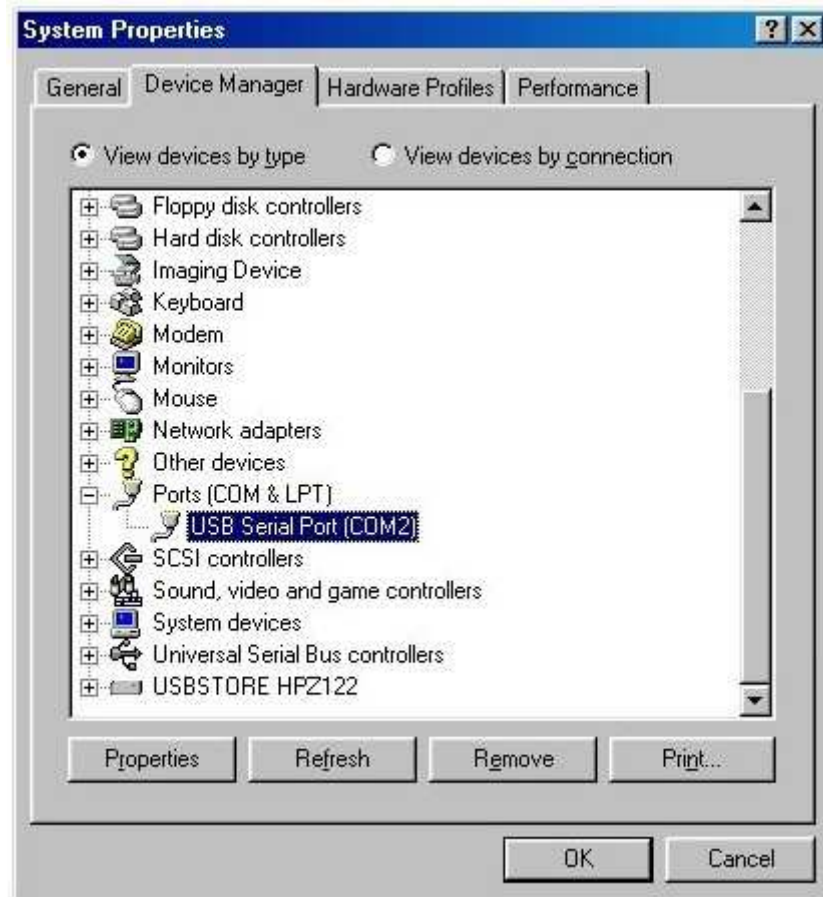| Command			Action
dec	hex	ASCII	
90	5A	Z	Get software version - returns 2 bytes, the first being the Module ID which is 15, followed by the software version
91	5B	[	Get relay states - sends a single byte back to the controller, bit high meaning the corresponding relay is in position 1
93	5D	]	Get DC input voltage - returns the supply voltage as byte, this is fixed at 50 meaning 5.0V DC
97	61	a	Get temperature-Raw data, 2 bytes MSB+LSB temperature=(MSB*16+LSB)/16
98	62	b	Get temperature-Character output. For example: 23.943 celsius degree
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:Intall the Driver

This module uses FT232RL USB to UART chip . Before using it you will need to download the FT232RL Driver.
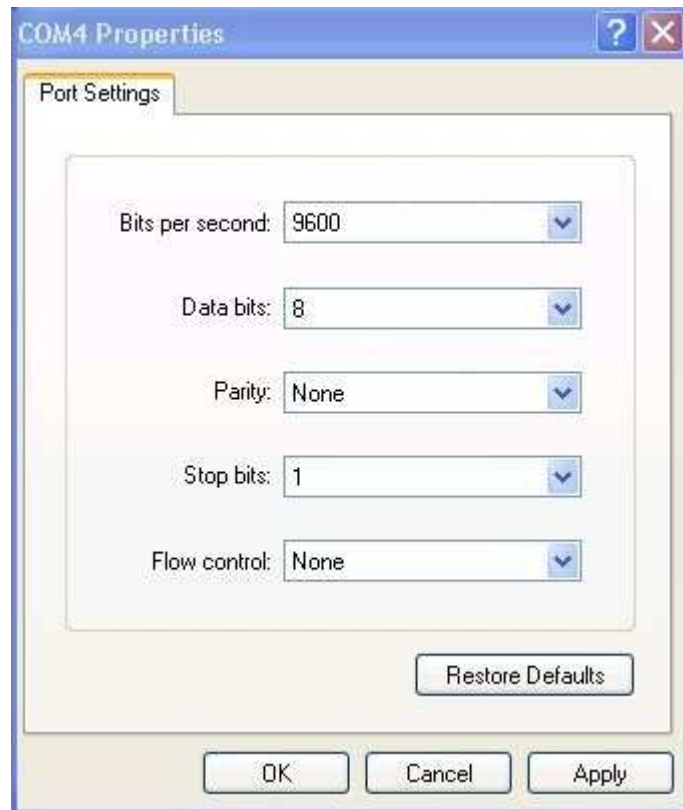
Connect the module to computer and windows will detect it and ask for the drivers. Point windows to the inf folder and it will install the driver.
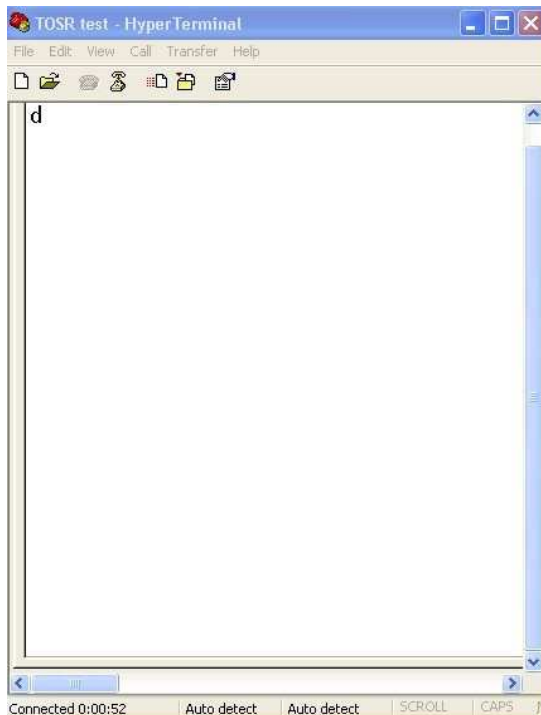
A new com port will now appear.
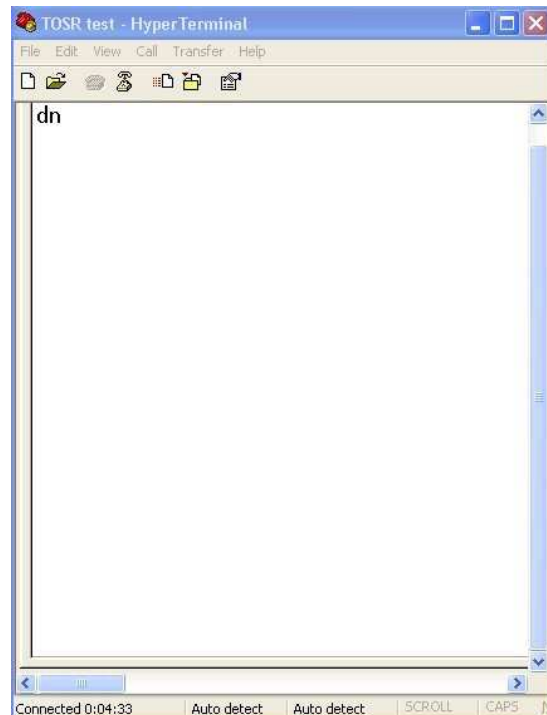
Step2:Run HyperTerminal

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.
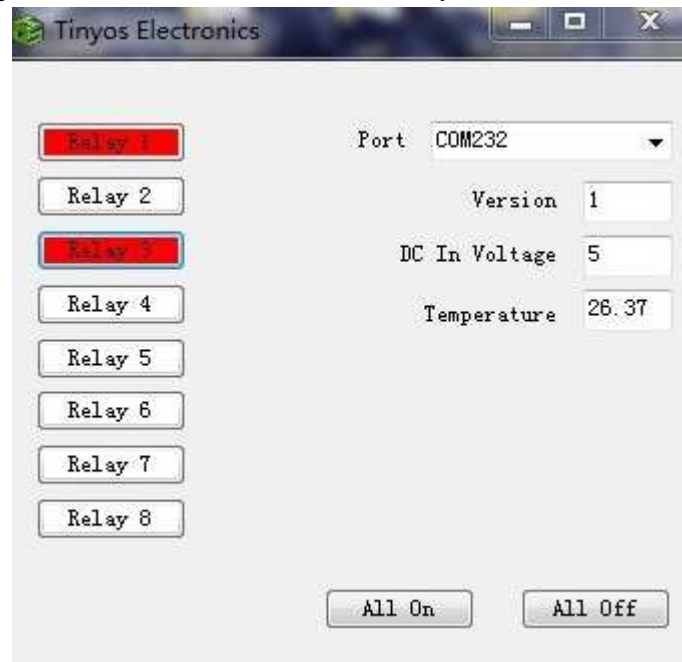
COM Port Setting

Send ASCII 'd'->All relay on
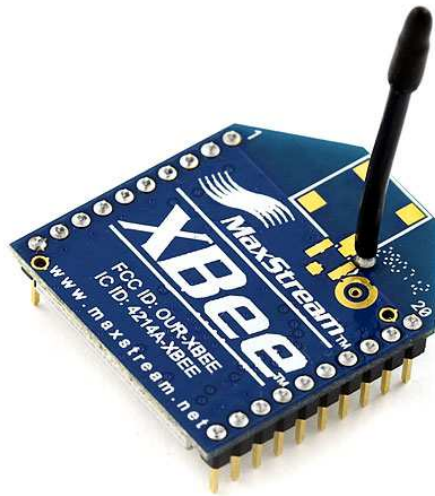

Send ASCII 'n'-> All relay off

Step3:Testing Program

To get the TOSR04-T up and running in the minimum amount of time we have put together an example program to demonstrate the functionality of the module

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.
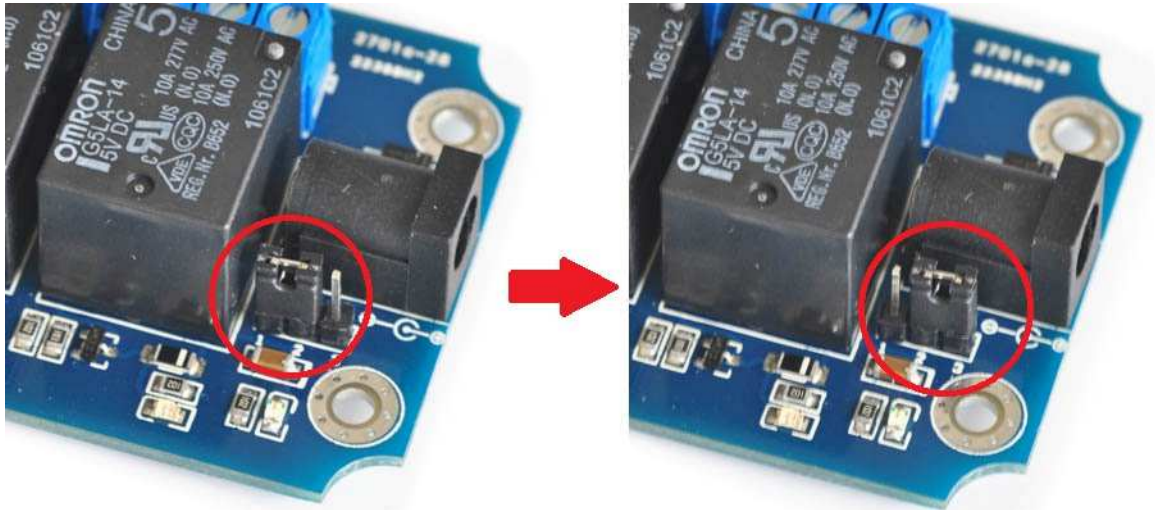
Step1: Plug Xbee to TOSR relay module

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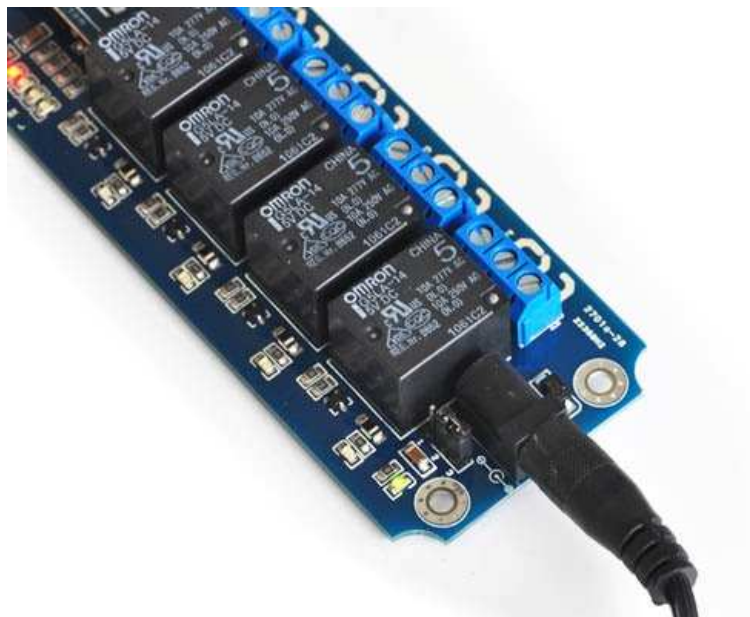

Step2: Set Power jumper to DC power mode

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.
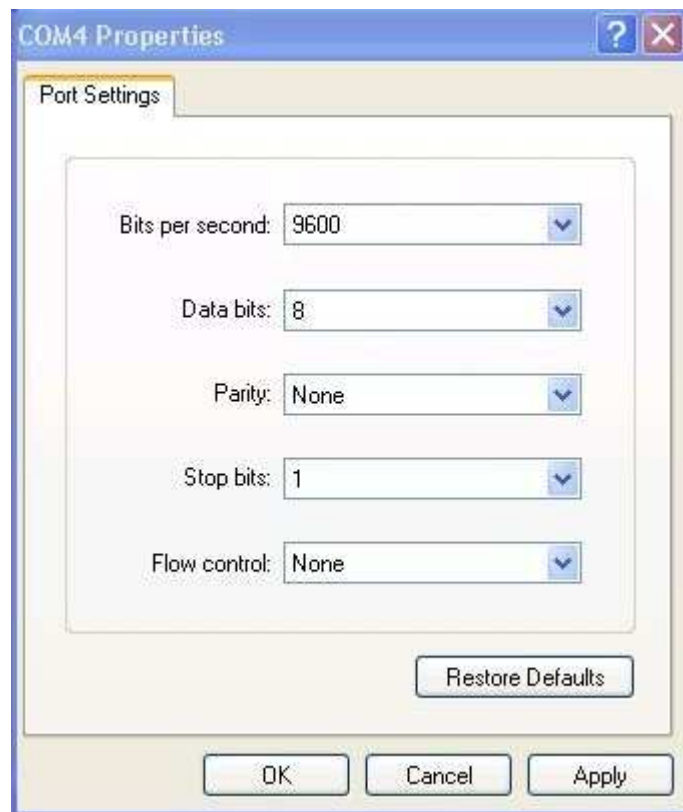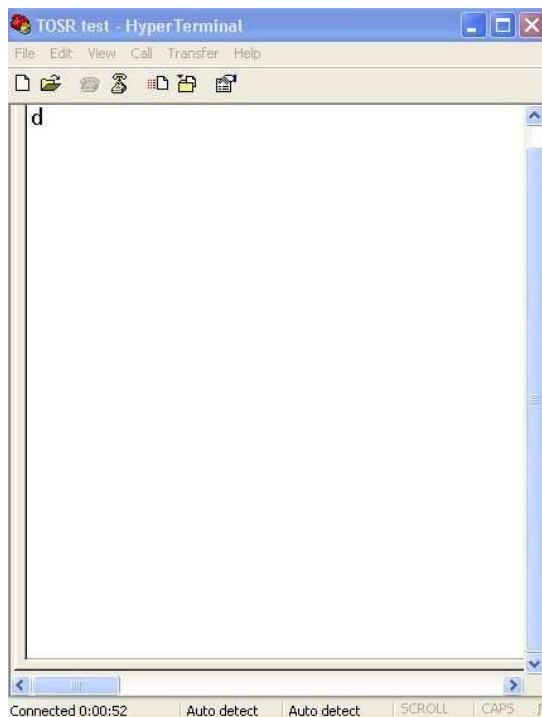

DC 5V power supply

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.
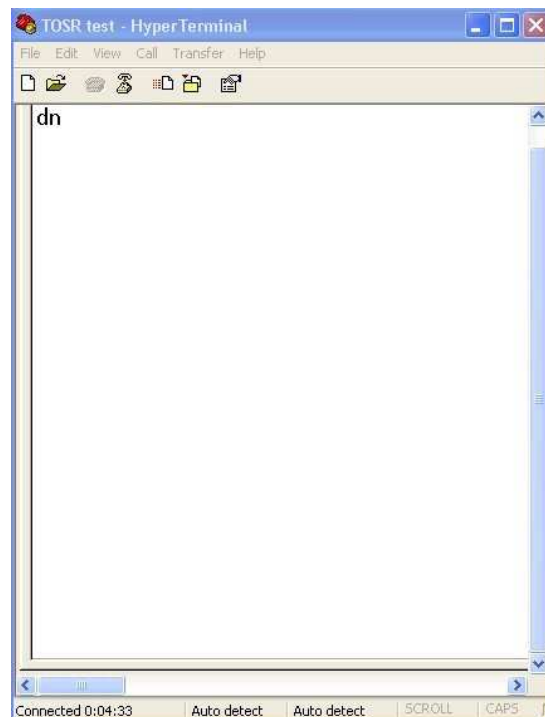
Step4: Send command

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 compatct size and the pinout
is compatible with XBEE which is suitable for all kinds of microcontroller systems who ha ve 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. I t acts like a transparent serial port, which works with a variety of Bluetooth adapter and Bluetooth phone.
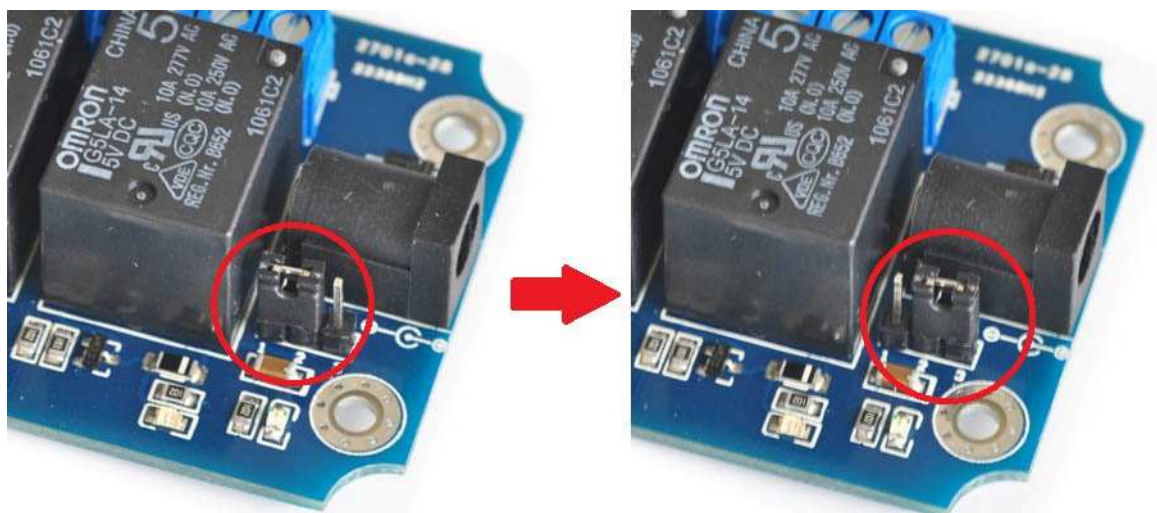

Step1: Plug Bluetooth Bee to TOSR-T relay module

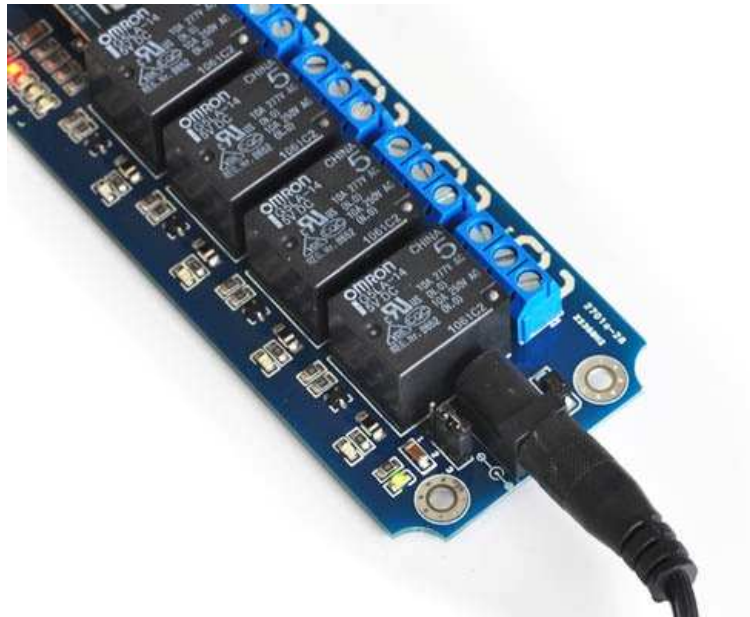Plug Bluetooth Bee module to TOSR-T relay module.

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

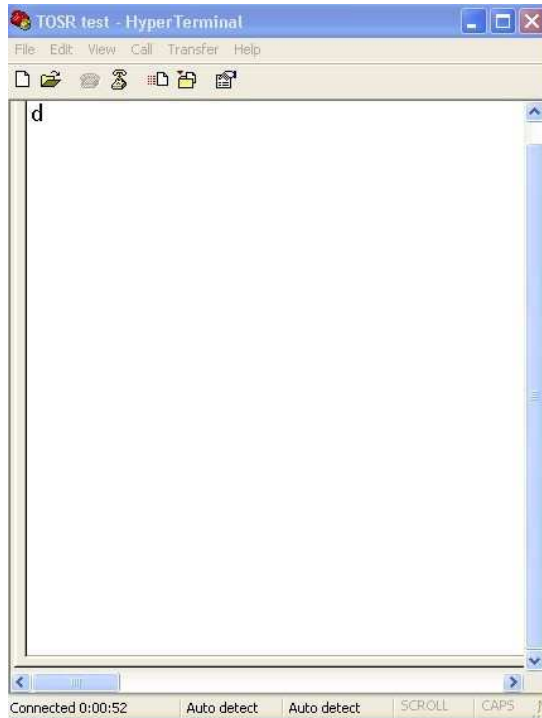If you computer does not support bluetooth, you may need a bluetooth USB dongle like this:

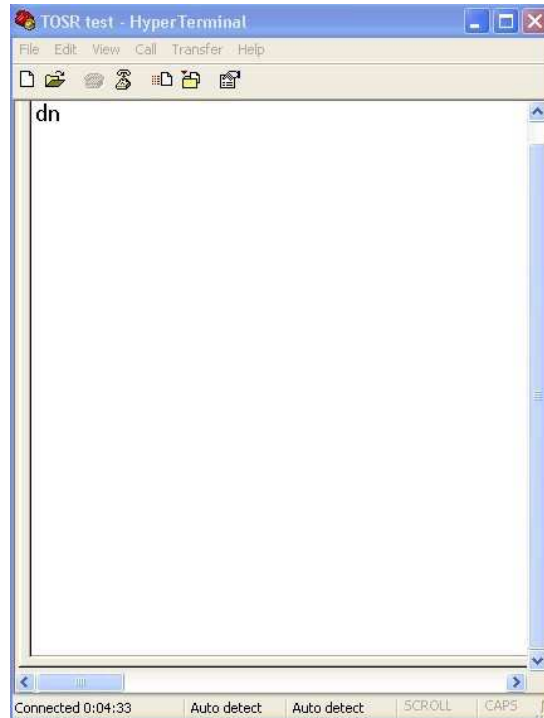If you windows bluetooth drivers can't use, you need download BlueSoleil to use.

If your computer already have bluetooth, just skip this step.

Connect with BluetoothBee and the default Pair number is 1234.

Then you can use the Bluetooth link com port by Hyper Terminal and send test command.
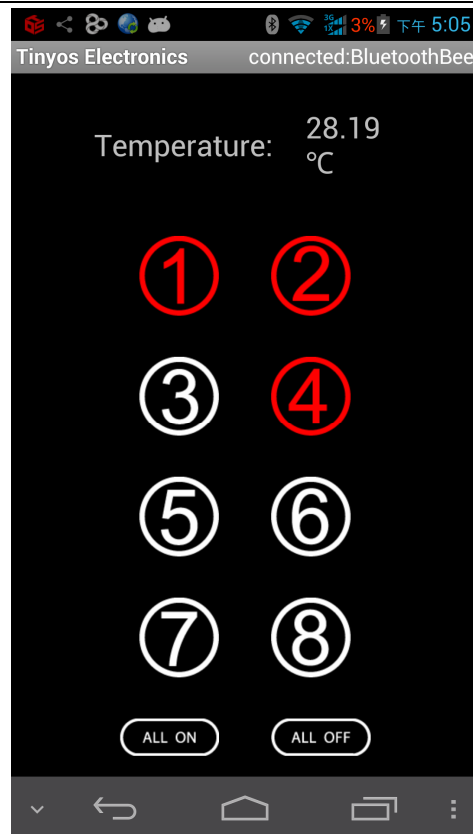
Send ASCII 'd'->All relay on   Send ASCII 'n'-> All relay off
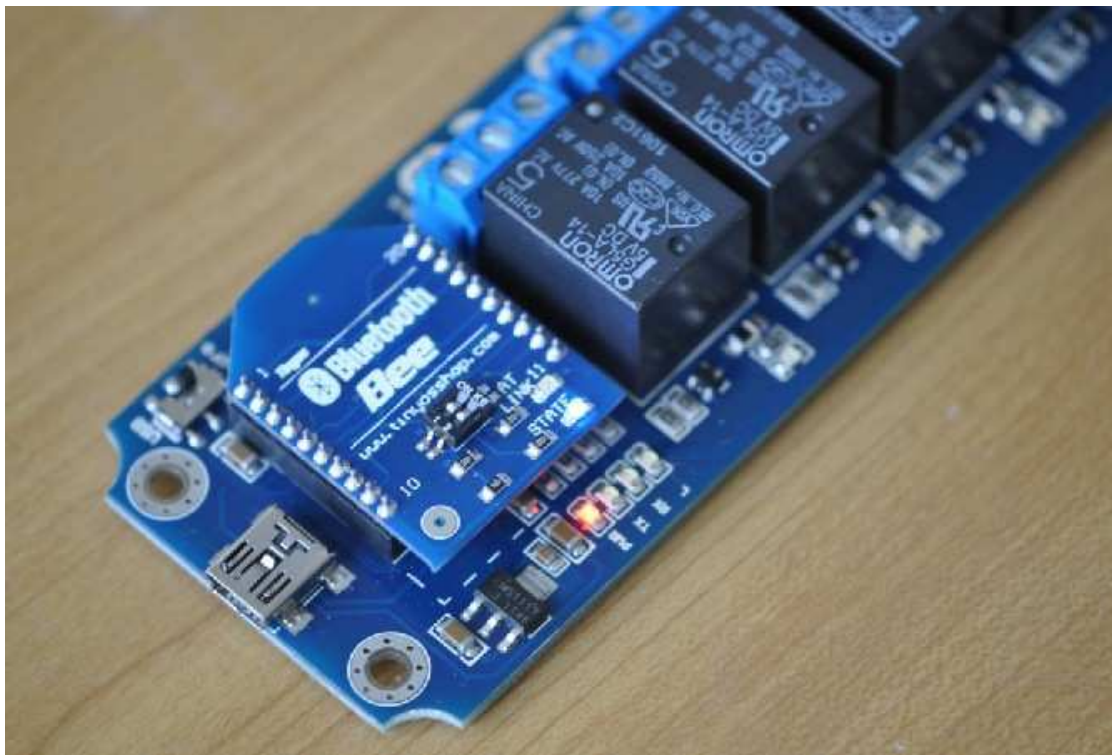
Controlled by mobile phone

Android Bluetooth APP
We provide a FREE APP for this USB relay board. You can control your device by your smart phone very easily. You can download the APP Here
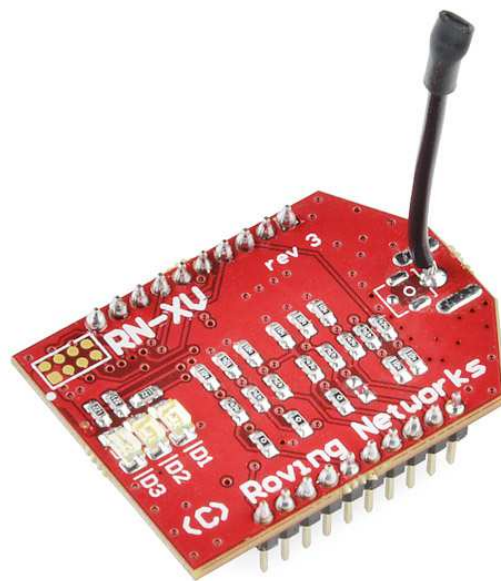
Connect device->select BluetoothBee->then you will find BluetoothBee blue STATE LED turn ON.

Click white button turn on relay, click red button turn off relay. And this APP Real-time get current temperature.
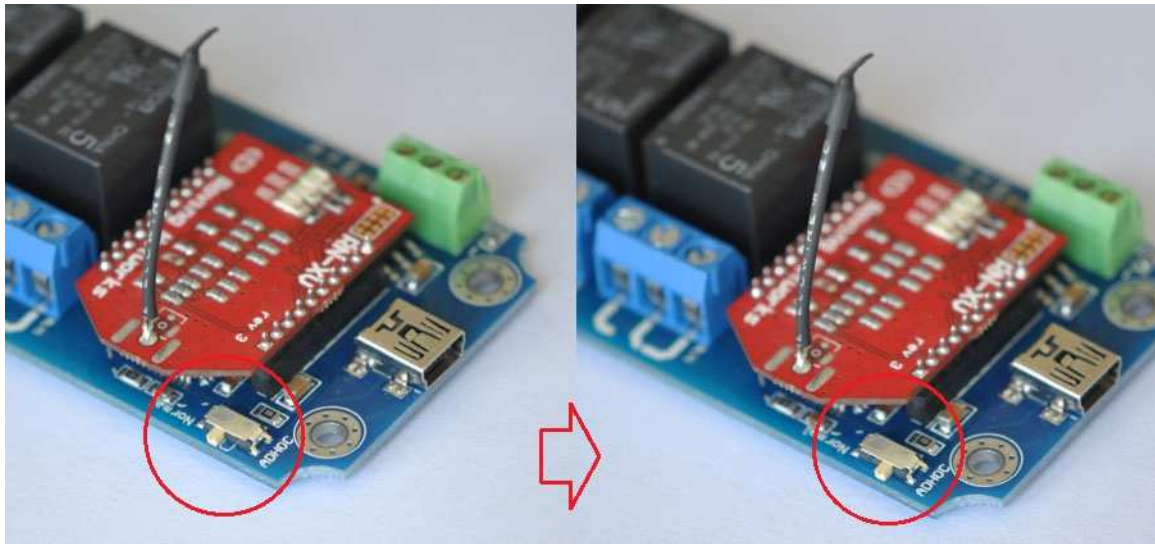
WIFI Remote Control

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.
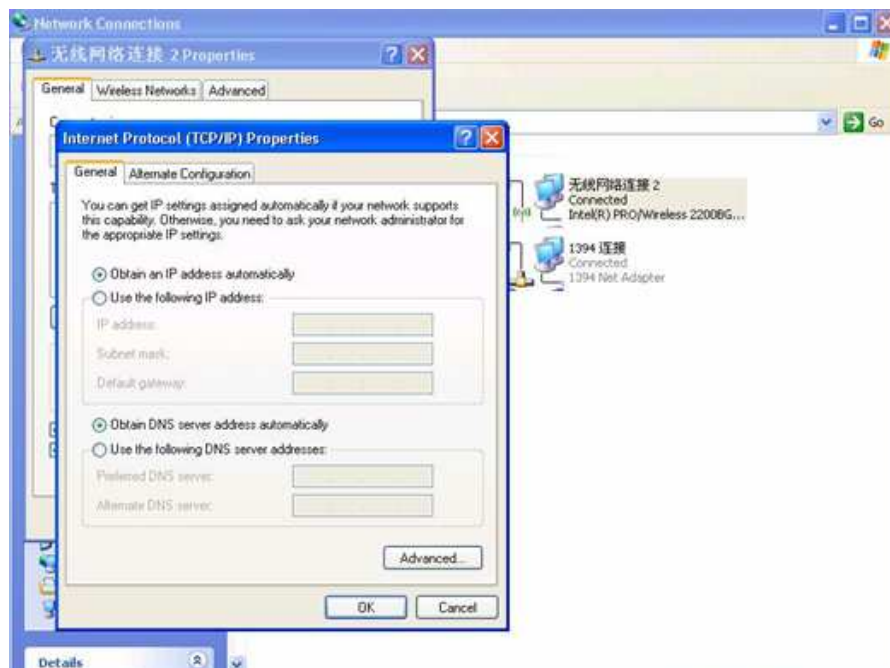

Step1: Configuring wifly module

First, we need configuring the wifly module. Plug your wifly module to the wireless socket. Set the mode from Normal->ADHOC* And then power the TOSR04-T module. Wifly create a ADHOC network. The leds on the wifly will blink in sequence.

*New version wifly module will entering soft AP mode. Default IP is 1.2.3.4:2000

Please refer the following steps to configure your wifly module.

1. Set your computer Obtain an IP address automatically.

2. From your computer, You will find a new wireless network named Wifly-GSX-XX or Wifly-EZX-XX(AP mode)

Connect to the WiFly-GSX-XX (WiFly-EZX-XX) network. This is an open network that does not require a pass phrase or pass key.

NOTE: It may take a couple of minutes for Auto IP in Windows to assign an IP address and connect to the network. You can check IP address of your Windows computer by running the ipconfig command in the command window. If connected, this command will show you the IP address and net mask for your computer.
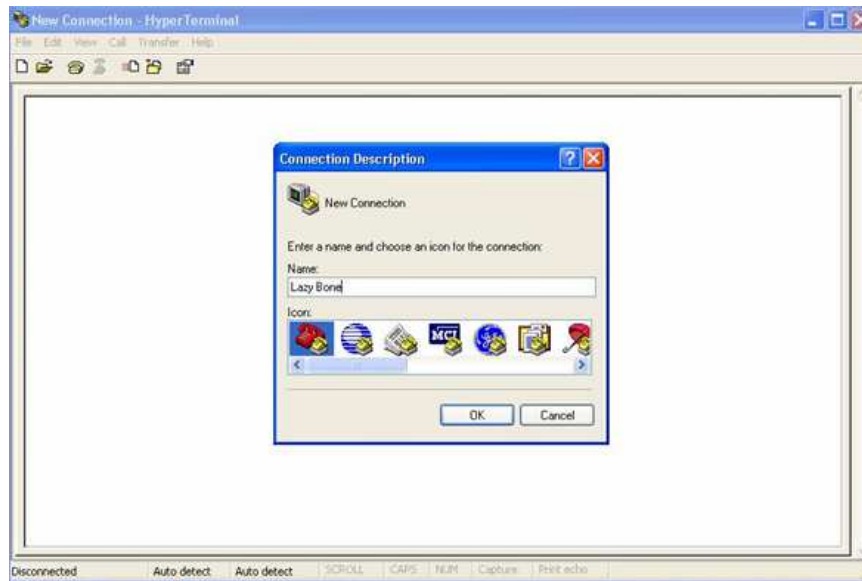
ADHOC:

The IP address assigned by Auto IP must be on the subnet 169.254.x.y subnet otherwise the Wifly module will not be accessible.

AP:

The IP address assigned by Auto IP must be on the subnet 1.2.3.x subnet otherwise the Wifly module will not be accessible.

NOTE: If your machine has both wireless and wired interface hardware you may need to disable the wired LAN interface hardware before connecting to the adhoc network.   If the wired LAN is enabled, the computer may assign an IP address that is not on the same subnet as the Wifly module.

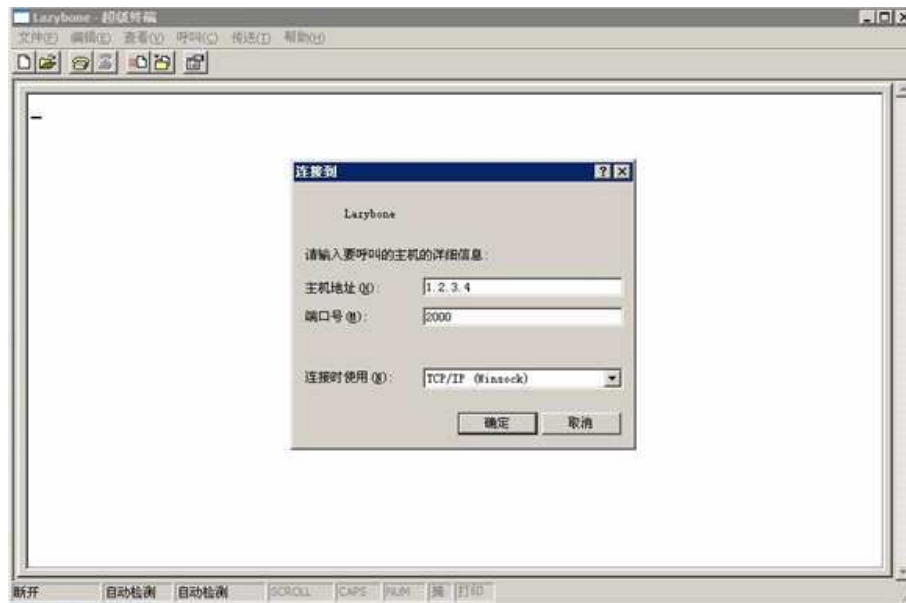3. Run HyperTerminal and create a new connection.

ADHOC mode

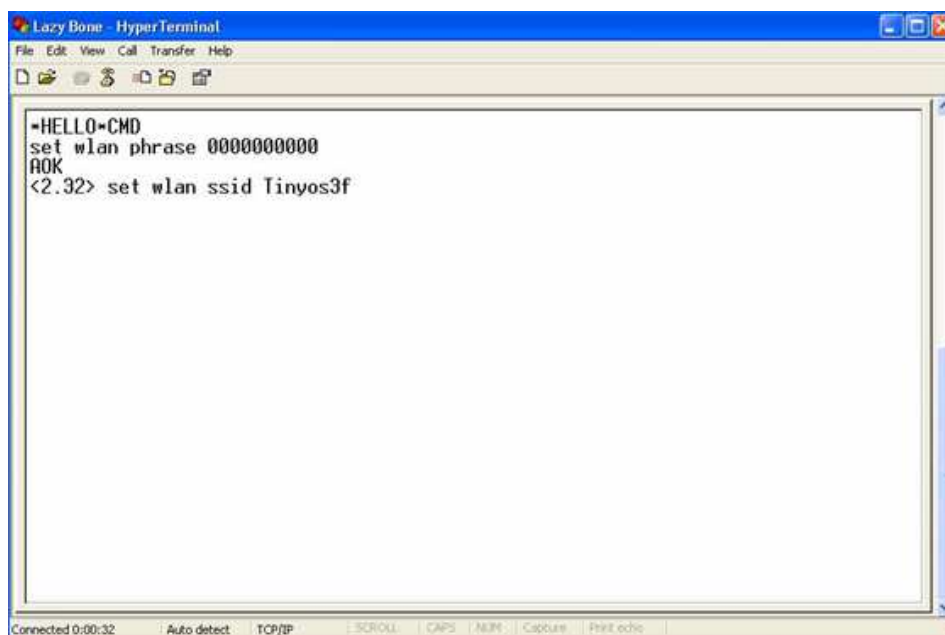Telnet into the Wifly WiFi module on port 2000   telnet 169.254.1.1 2000

AP mode

Telnet into the Wifly WiFi module on port 2000   telnet 1.2.3.4 2000

Once connected and you have a good IP address. You should see the response *HELLO* 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>
set wlan join 1
save

*Our test network ssid is Tinyos3f. Wlan phrase is 0000000000
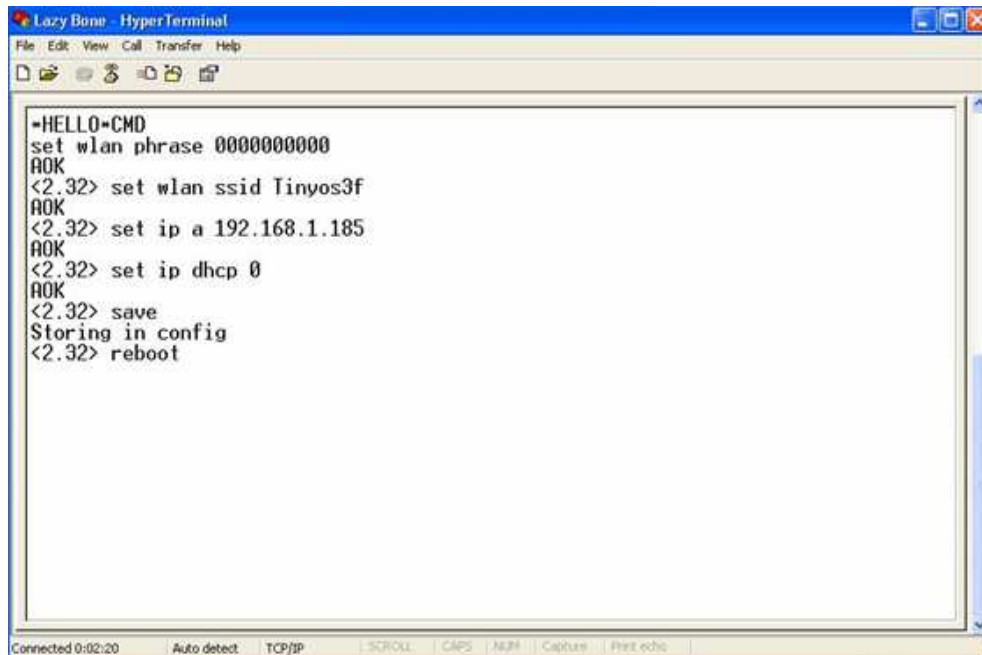
And if you want a fixed IP address. Here is the command:

set ip a <your IP>

set ip dhcp 0

set sys printlvl 0

save

reboot

Here we set our WIFI module IP address: 192.168.1.185

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.
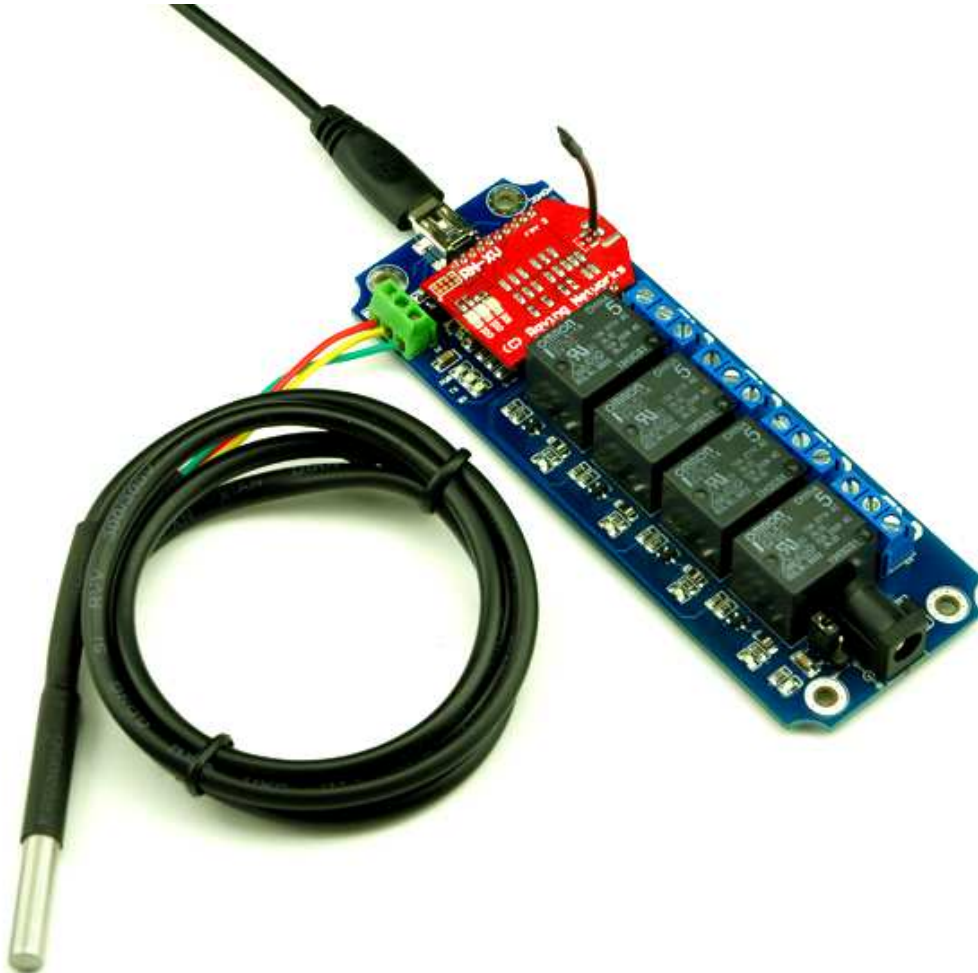
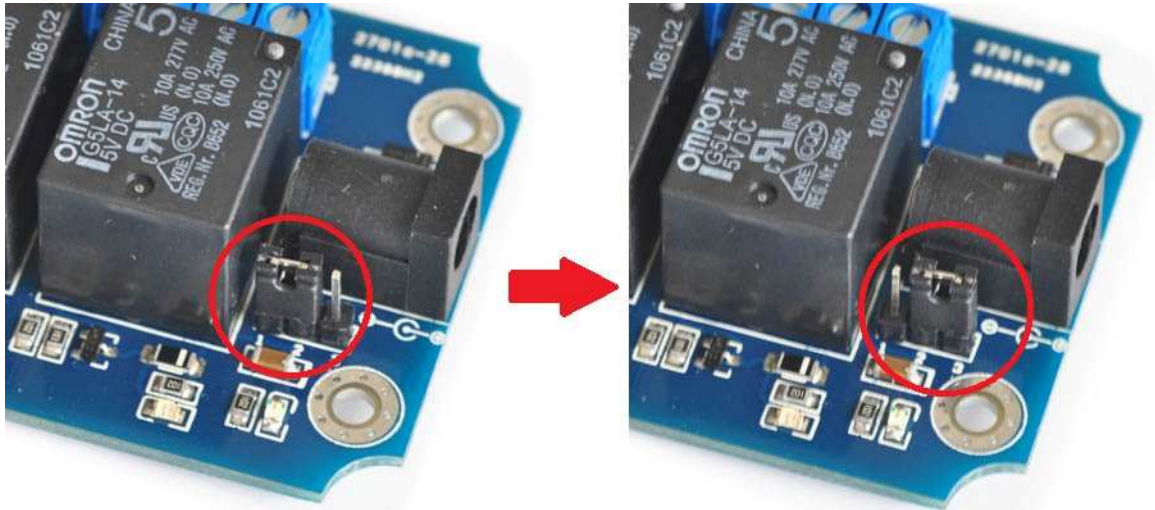set comm idle 5

save

reboot

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

Step2: Set back to Normal mode

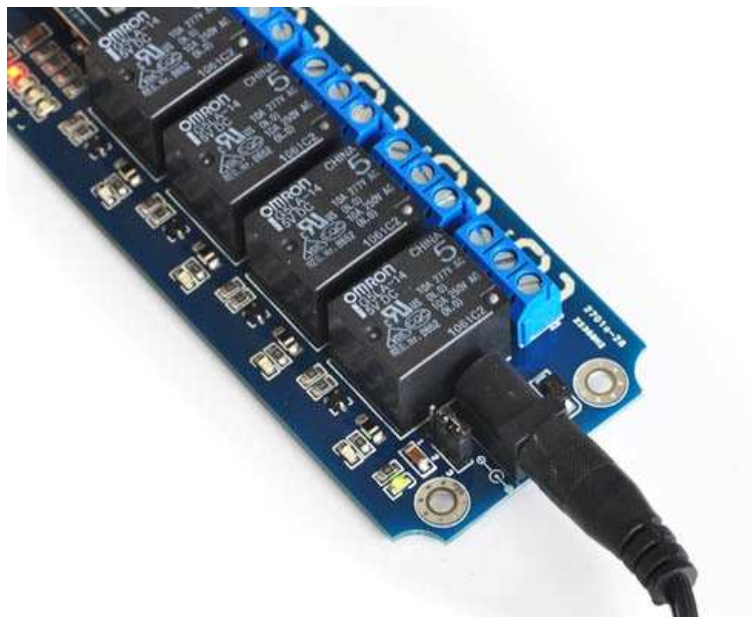Make sure setting switch on 'Normal' postion.

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.

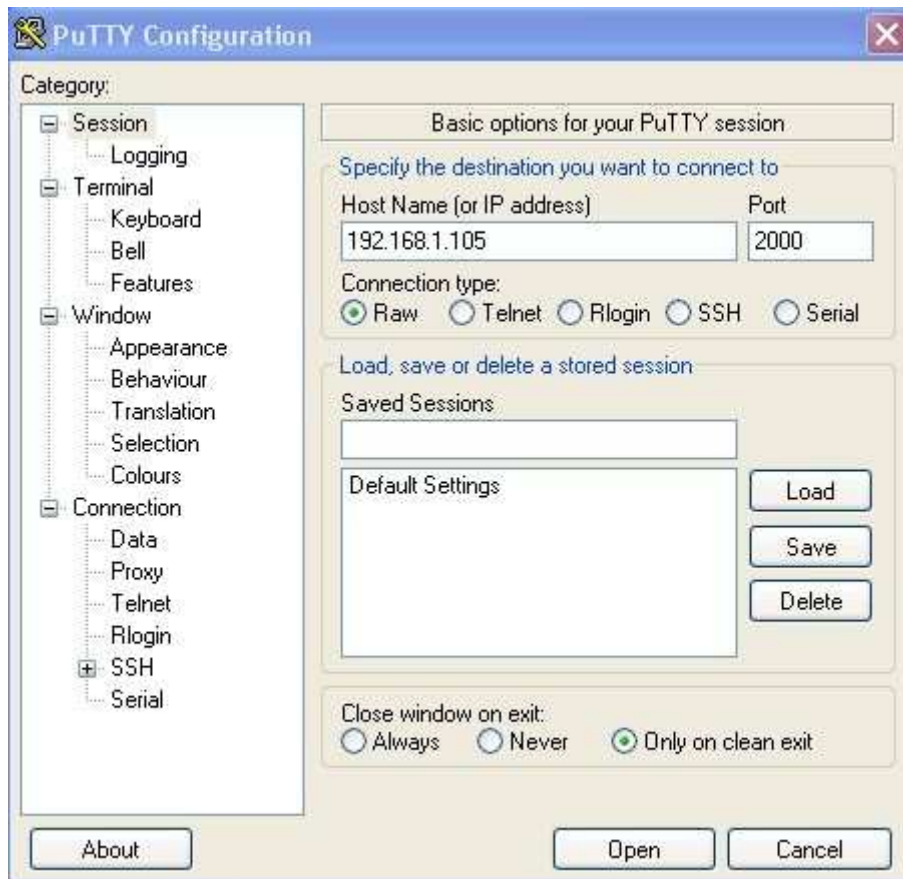So, we need set the power jumper to DC power mode, and then power the module by DC 5V power supply.

DC 5V power supply

Step4: Send test command

Controlled by computer

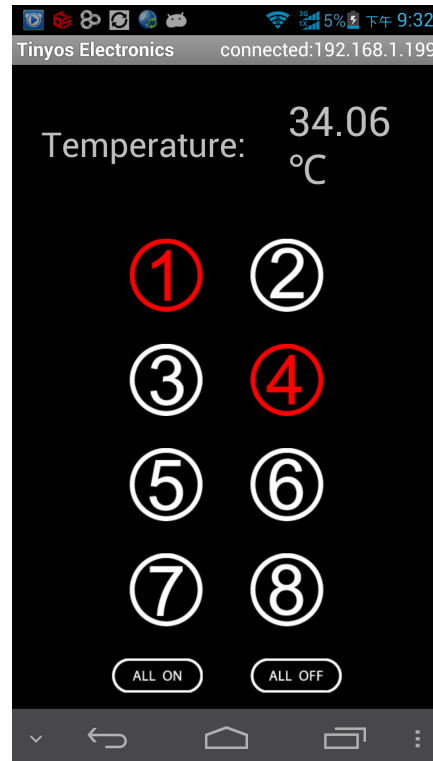You can send a test command by **Putty** program.

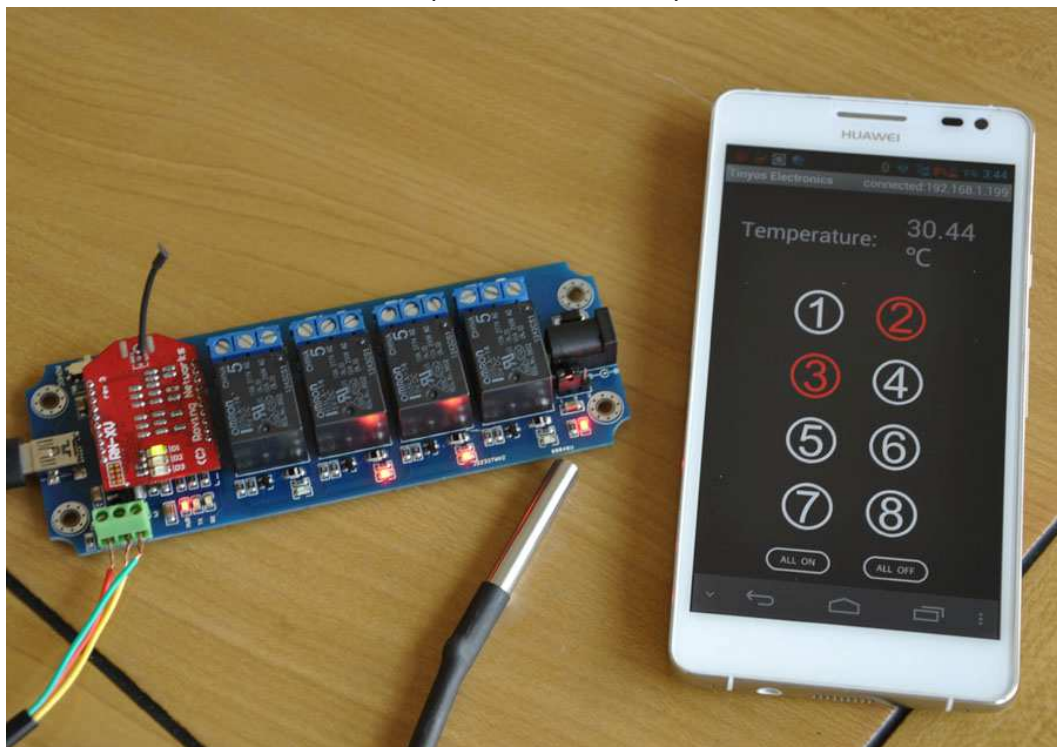Send ASCII command 'd' ->All relays on

Controlled by mobile phone

Android WIFI APP

We provide a FREE APP for this USB relay board. You can control your device by your smart phone very easily. You can download the APP Here

Connect Menu->Connect device->Input IP address and port number and connect it.

Click white button turn on relay, click red button turn off relay. And this APP Real-time get current temperature.