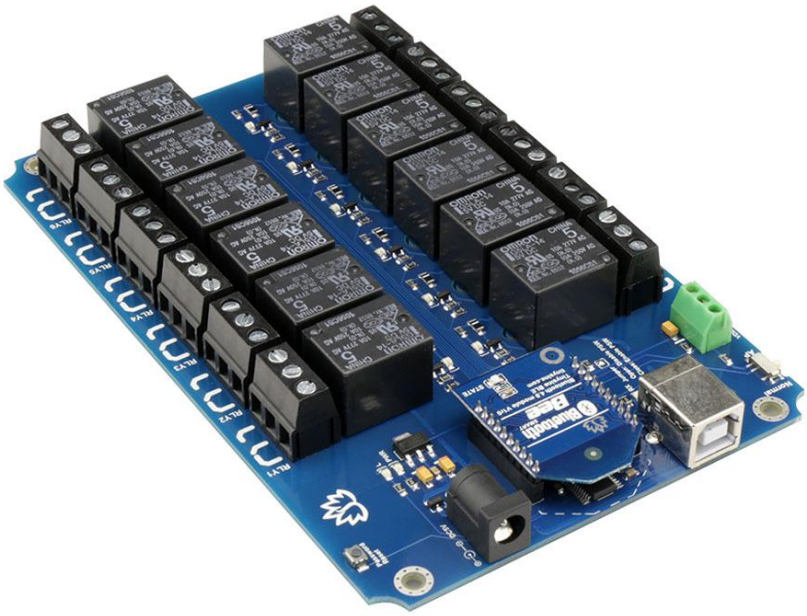
TinySine

TOSR196 Bluetooth Relay

User Manual



TinySine Electronics @ 2018
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INTRODUCTION

TOSR196 is a smartphone controlled relay board, it has 12 relays and each relay can be set to latching or momentary output independently. TOSR196 allows computer to control switching of external devices by using the USB port of your computer. It also has a wireless extension port, after you install a Bluetooth module, you can control your device with an Android smartphone or iPhone.

TOSR196 provides 12 volt free contact relays, they are SPDT types and can output with a current rating of up to 10Amp each. The board is powered from a 5VDC power supply. The DC input jack is 2.1mm with positive core polarity.

SPECIFICATIONS

- Rated voltage: DC5V
- Baud rate: 9600
- Number of Relays: 12
- Relay switching power: 10A/250VAC
- Each channel can be set to latching or momentary output independently
- Password supported
- Communication Mode: USB/Bluetooth

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.

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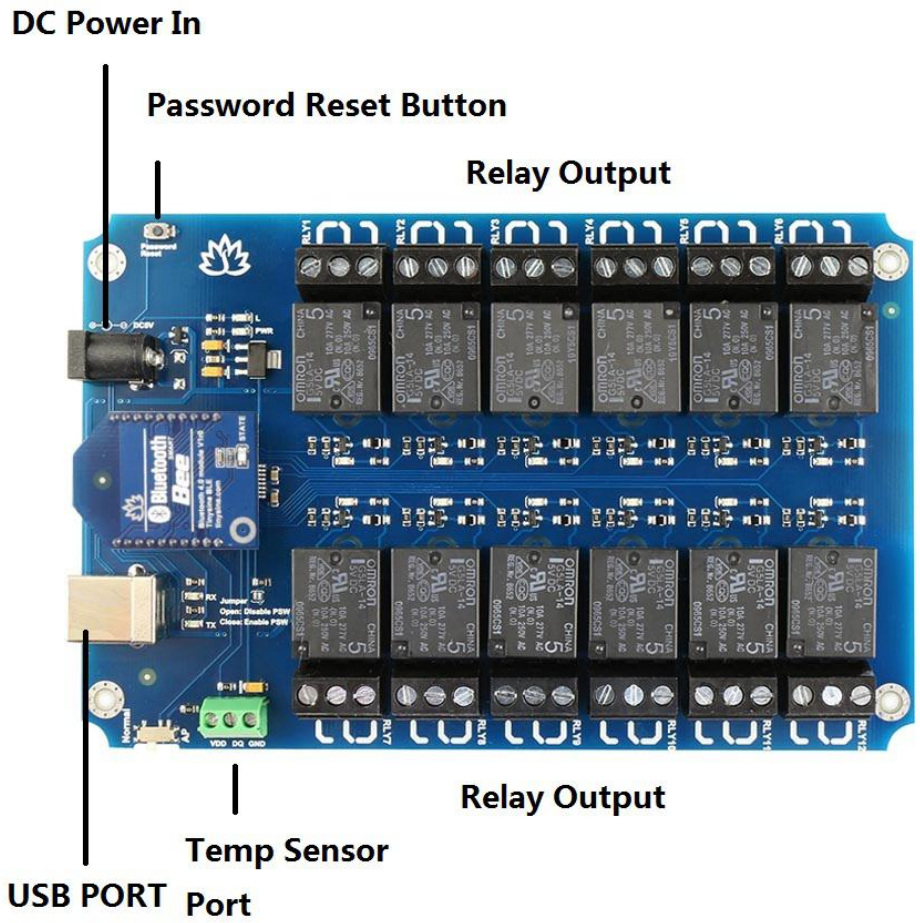
Your use of this circuit indicates your acceptance of these terms

Module Overview



1. USB Port: this port is used to control TOSR196 by computer, or update board's firmware, but you need to power the board with DC 5V power supply.You need remove the Bluetooth module when you use USB port.

2. Bluetooth Module: Plug the Bluetooth module to this socket if you want to control the board with wireless mode.

3. Relays: these 12 relays are SPDT types, each one can be set to latching or momentary output and turned ON/OFF independently. This kind of relay can stand high voltage up to 10A/250VAC.

- **Latching Mode**

In latching mode, after you click relays buttons, relays are always in status of latched either **ON** or **OFF**, and if you click buttons again, relays will be turned to the opposite

status.

- **Momentary Mode**

In momentary mode, relay's contact is always disconnected. You need to press and hold the button to keep relay closed, once remove from buttons, contact will be disconnected automatically.

4. Output Screw Terminals: these screw terminals are used to connect electrical equipment, such as light bulbs, fans, heaters or anything you want to control with TOSR196. You need to power equipment with extra power, but don't exceed the voltage that relays can stand, and be careful!

5. DC Power In: TOSR196 need be powered with DC 5V power supply, either in USB mode or Bluetooth remote control mode. If you want power it with DC12V or 24V, you just need a 12V/24V-5V DC converter.

Commands

TOSR196 operates with an easy to use command set as described in the table below.

Command			Action
dec	hex		
63	3F		Verify the password,followed by 3 bytes password. Reply 0x01: password correct
64	40		Set the password, followed by 3 bytes password. Reply 0x01: password has been changed
65	41		Set working mode to latching. You need send 2 bytes: 0x41 0xXX(XX Is 00-0C stand for relay1-relay12)
66	42		Set working mode to momtentary. You need send 2 bytes: 0x42 0xXX(XX Is 00-0C stand for relay1-relay12)
67	43		Get current working mode-returns 12 byte,(relay1-relay12).0x41 is latching mode and 0x42 is momentary mode
68	44		Get all states-returns 4 bytes,relay states+temperature raw data,the 2nd byte is useless
90	5A		Get firmware version of the board
91	5B		Get relays'state-return 1 byte,bit high meaning the corresponding relay is in position 1
93	5D		Get working voltage of the board
97	61		Get temperature raw data-returns 2 bytes MSB+LSB,temperature=(MSB*255+LSB)/16
98	62		Get temperature-returns character,for example:23.94 celsius degree
100	64		All relays to position 1
101	65		Relay 1 to position 1
102	66		Relay 2 to position 1
103	67		Relay 3 to position 1
104	68		Relay 4 to position 1
105	69		Relay 5 to position 1
106	6A		Relay 6 to position 1
107	6B		Relay 7 to position 1
108	6C		Relay 8 to position 1
128	80		Relay 9 to position 1
129	81		Relay 10 to position 1
130	82		Relay 11 to position 1
131	83		Relay 12 to position 1
110	6E		All relays to position 0
111	6F		Relay 1 to position 0
112	70		Relay 2 to position 0
113	71		Relay 3 to position 0
114	72		Relay 4 to position 0
115	73		Relay 5 to position 0
116	74		Relay 6 to position 0
117	75		Relay 7 to position 0
118	76		Relay 8 to position 0
144	90		Relay 9 to position 0
145	91		Relay 10 to position 0
146	92		Relay 11 to position 0
147	93		Relay 12 to position 0

How to use

USB Control Mode

You need remove the Bluetooth module from the board first when you use it in USB control mode.

Step1:Intall the Driver

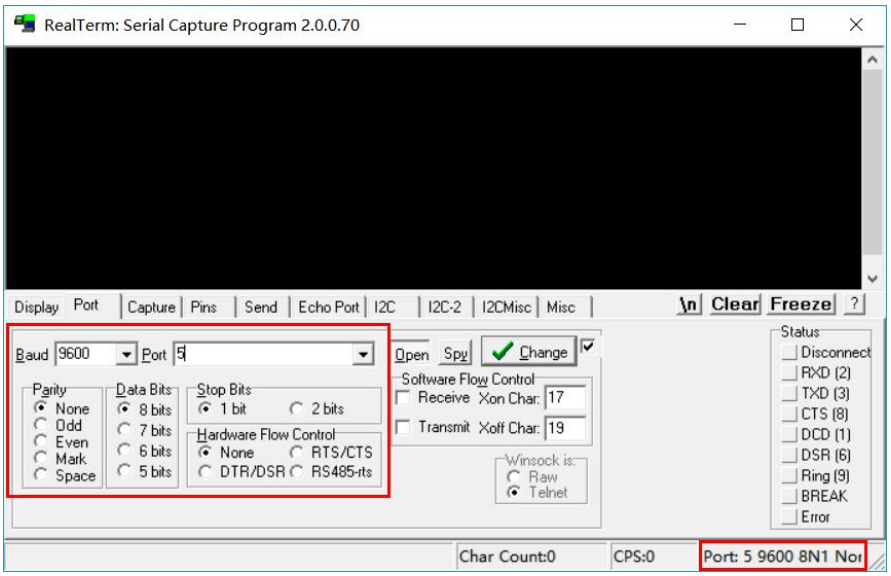
This module uses FT232RL USB to UART chip . Before using it you will need to download the FT232RL Driver.

Connect TOSR196 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 Realterm Serial Debug Tool to control TOSR196

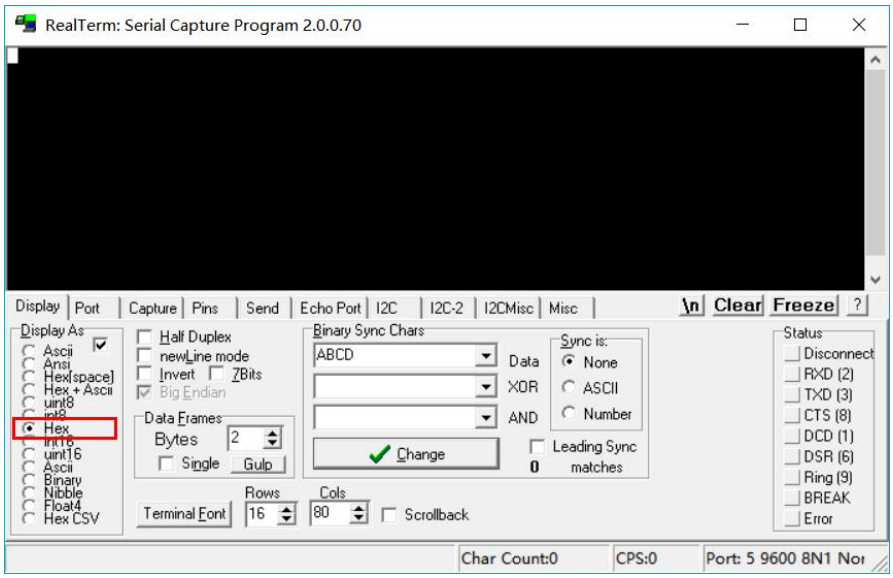
The TOSR196 relay board is controlled using serial command. Here we use Realterm, but your favorite terminal should work fine.

(1) Open Realterm, choose option “**Port**”, set the communication speed to **9600 8-N-1** and **disable** flow control then click “**Open**”, you should see the parameters from the bottom.



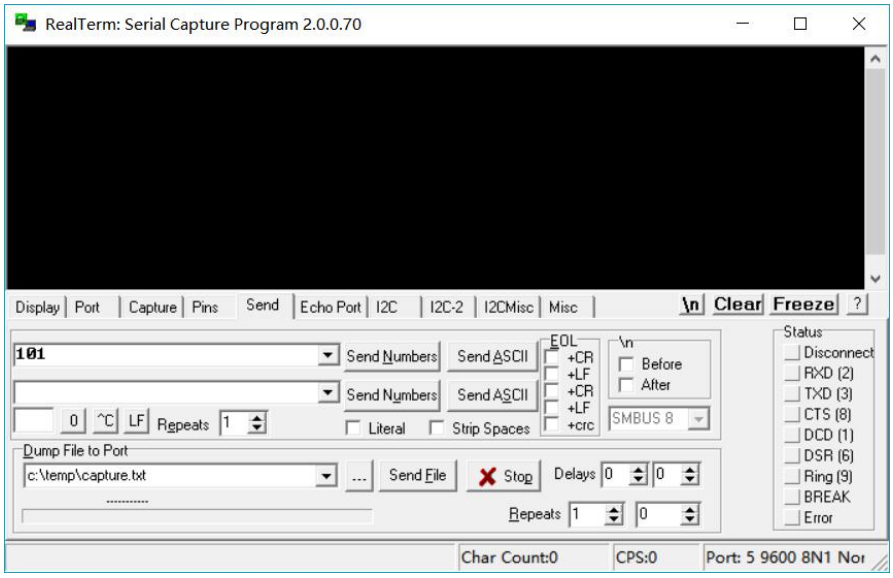
Port settings

(2) In option "**Display**", you can choose data format you want to display, Realterm has provided many selections such as ASCII, Hex, Dec, etc, here we choose "**Hex**".

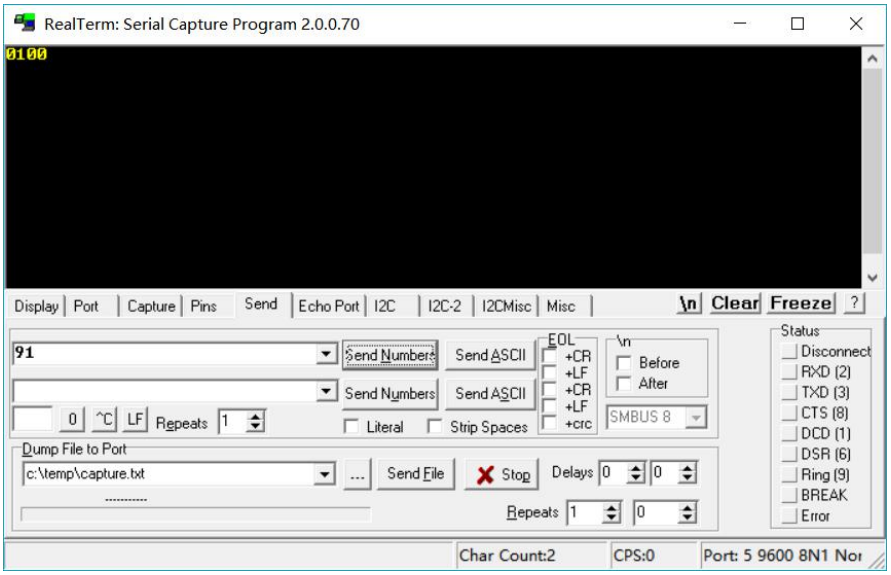


Set data display as Hex

(3) Now input the commands you want to send in option "**Send**", considering Realterm can only send data using **Dec** or **ASCII**, here we choose Dec for demo.
For example, input "**101**" and click "**Send Numbers**", you will turn on the relay 1. Then if you send "**91**" to query the relay states, you will get the same result "**0100**".



Turn on relay 1



Get relay states

Note: If you set relay to momentary mode, you need to send turn on command continuously to keep relay on.

For example, after you send "**66 02**" to set relay 3 to momentary mode, and you want to keep it ON, then you must send "**103**" all the time.

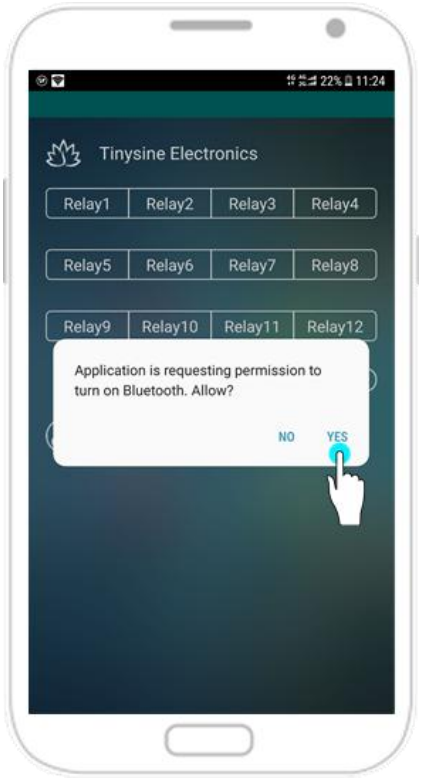
Bluetooth Remote Control

Please make sure Bluetooth module are on the board.

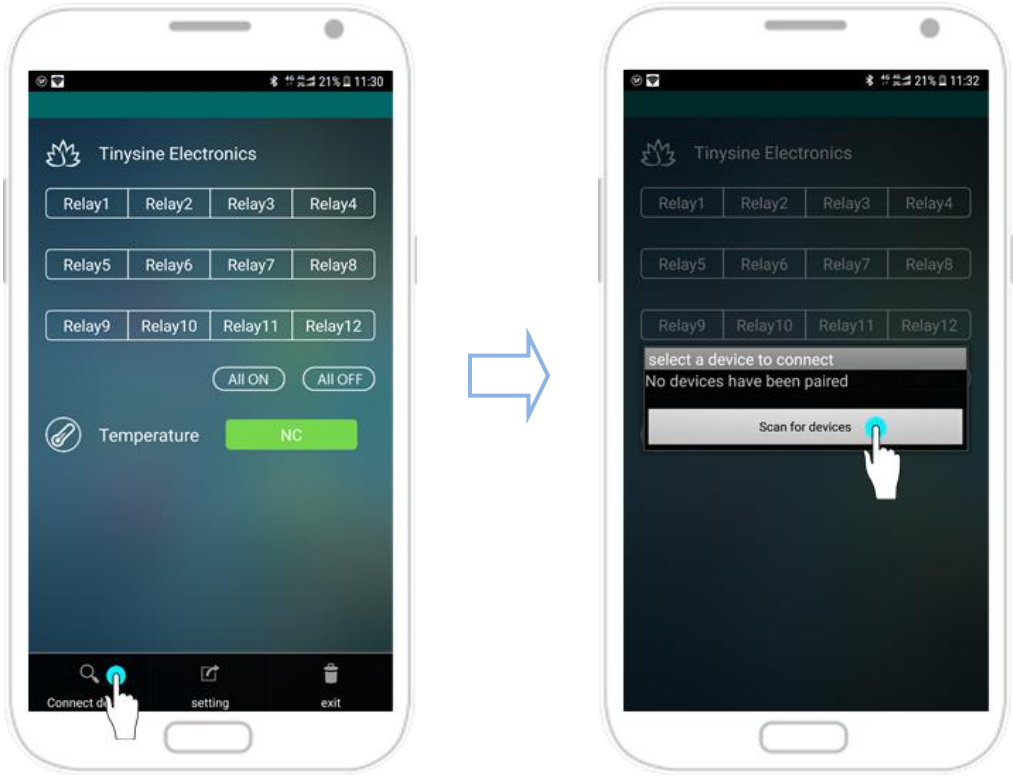
1. Connect with Android phone/iPhone

(1) Download the application here and install it to your android phone(must be android 4.3 or above), if you use iPhone, please search **TOSR12 BLE** in App Store.

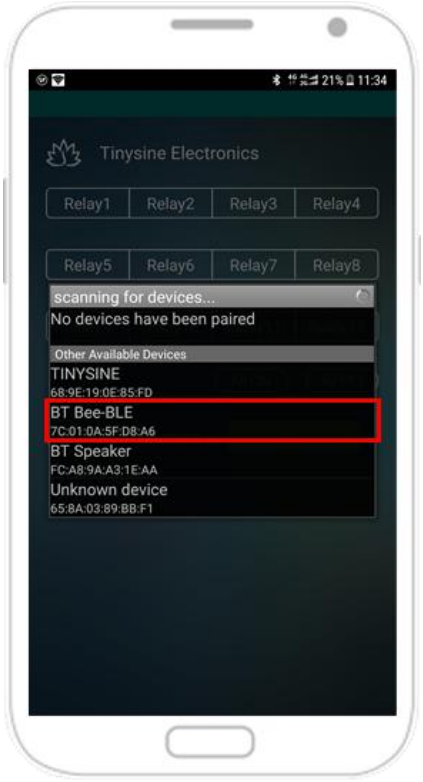
(2) Open the app, please allow the app to use Bluetooth if you haven't open it.



(3) Click the screen → **Connect Device** → **Scan for devices**. Your phone will search for nearby BLE devices automatically. You can also click buttons to start searching if your phone haven't connected to the board.

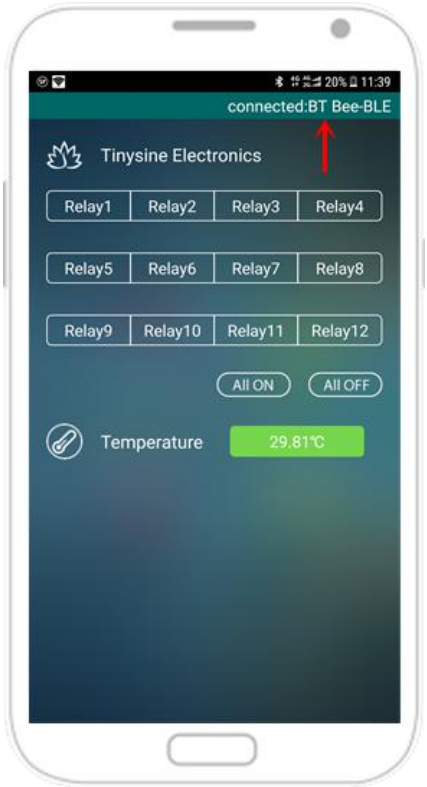


(4) Usually, TOSR196 is named as "**BT Bee-BLE**". Choose **BT Bee-BLE** to connect, it's a BLE device and no pair number needed.



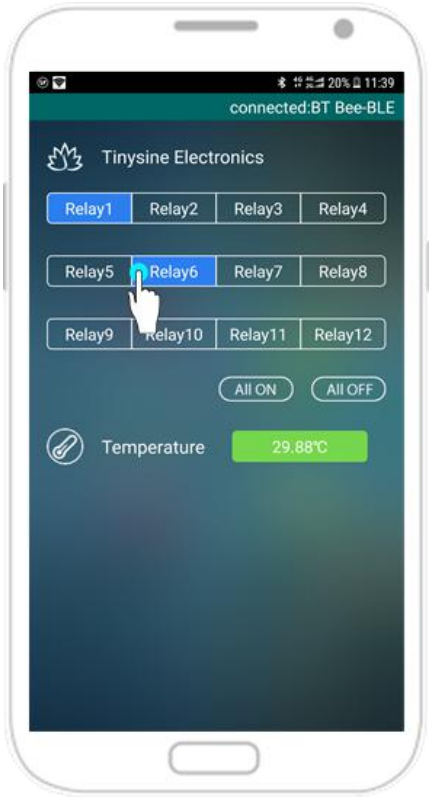
(5) If you have enabled the password function in TOSR196, then you will need to verify the password first, default is **123456**.

(6) After your phone has connected to TOSR196, app will show "**connected: BT Bee-BLE**" at the top.

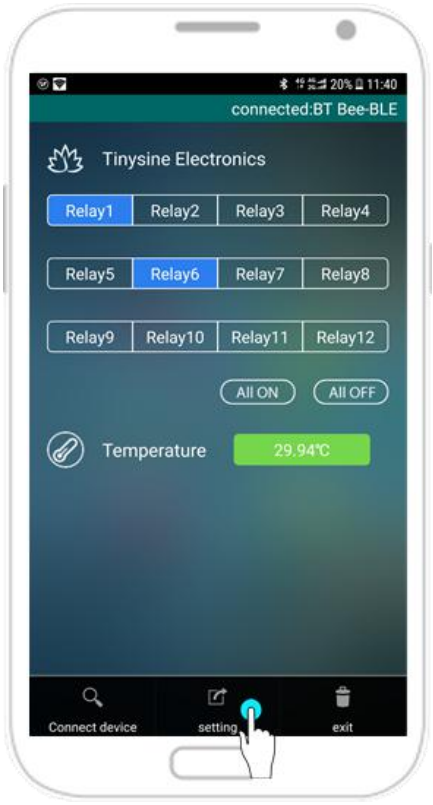


2. Control TOSR196

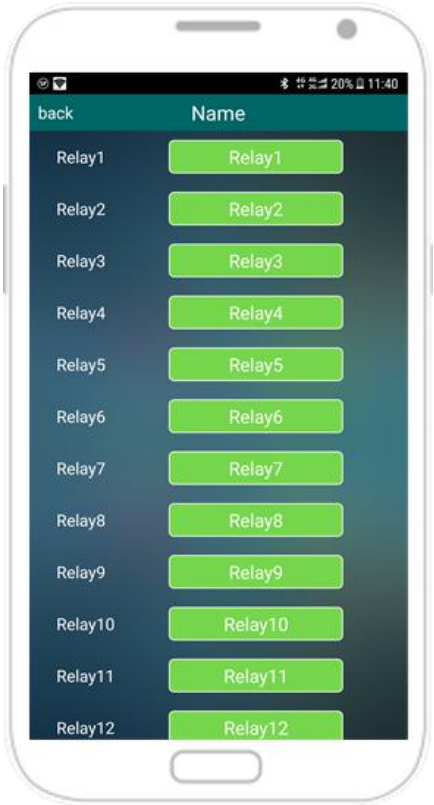
After connecting your phone with TOSR196, you can control it now. Click buttons **Relay1~Relay12** to turn on/off corresponding relays. All the buttons have 2 states: blue and white. Blue means relay is on and white is off. This is the basic function, we also provide some advanced features in the app.



(1) Click the screen to call out the menu → **setting**, you will find a sub-pages: **Name**.

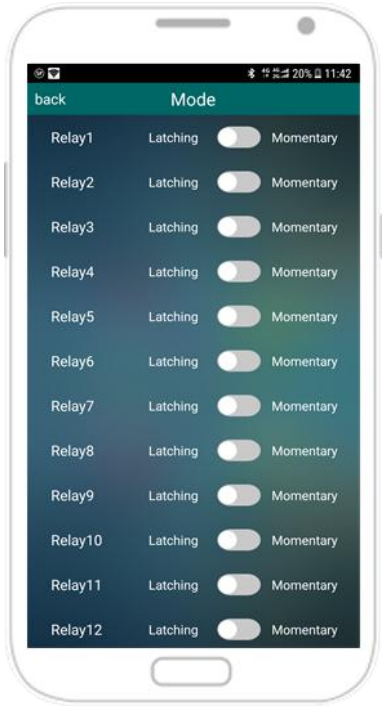


(2) In the Name page, there are 12 text boxes, default names is **Relay1, Relay2, ... Relay11, Relay12**, you can input words in these text boxes maximum length is 7 characters, then it will showed in the main screen.

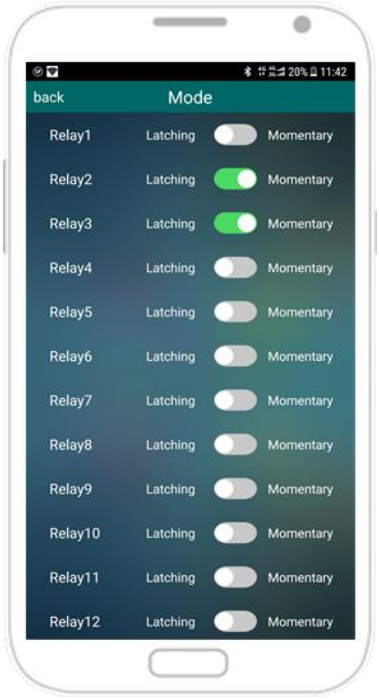


For example, here we input "**Lamp**" in the first text box and go back to the main screen, you will find the first button's name has been changed!

(3) Slide to the left in Name page, it's the **Mode** page to show 12 channels' current working mode: **Latching** or **Momentary**, you can also click the switch to set each relay working in latching or momentary mode separately.



Here we set **Relay2, Relay3** to momentary mode, then go back to the main screen, now you need to press and hold the button Relay2 or Relay3 to keep relay on, once released, relay is turned off.



APPENDIX

1. GL5A Relay Datasheet
2. Realterm Serial Debug Tool
3. iOS APP
4. Android APP

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