Serial 3Channel AC 230V SSR and Dimmer

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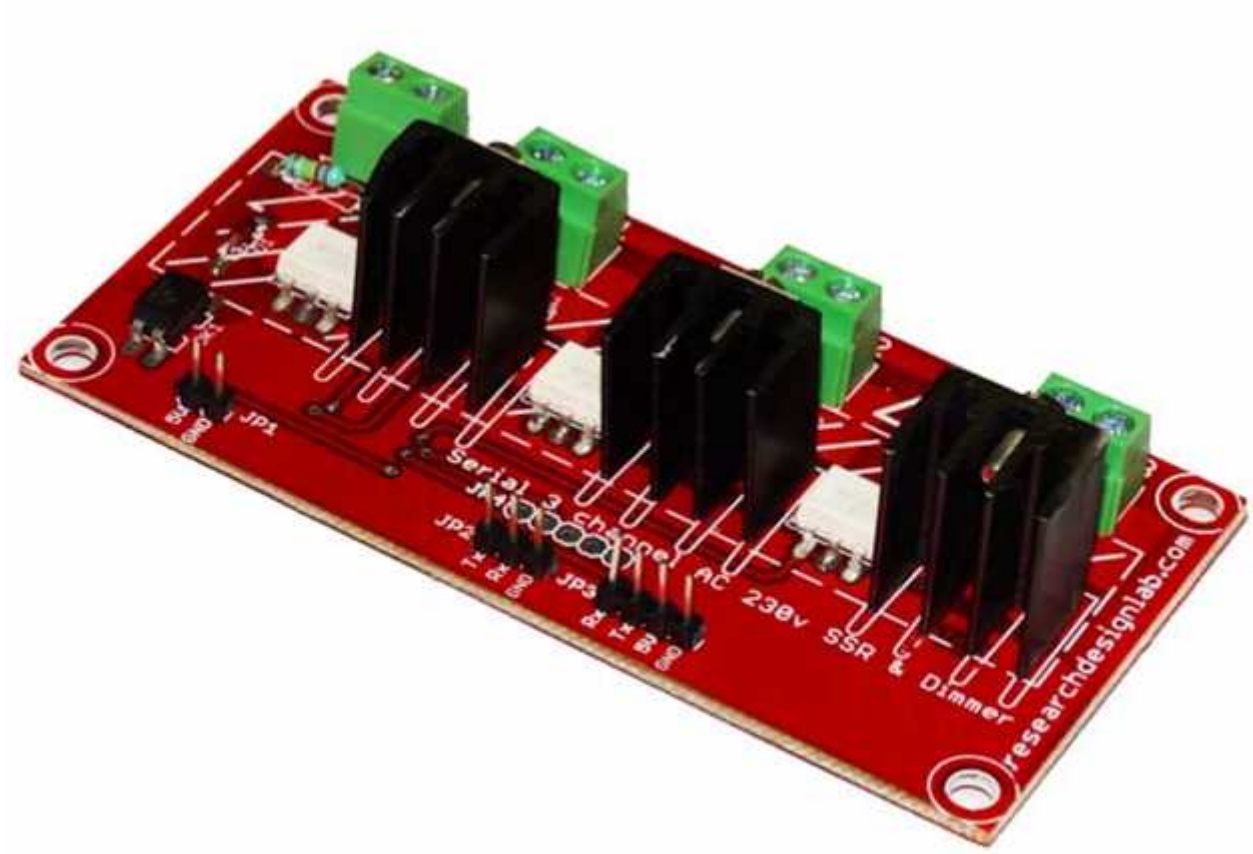
OVERVIEW

SERIAL 3 CHANNEL AC 230V SSR AND DIMMER



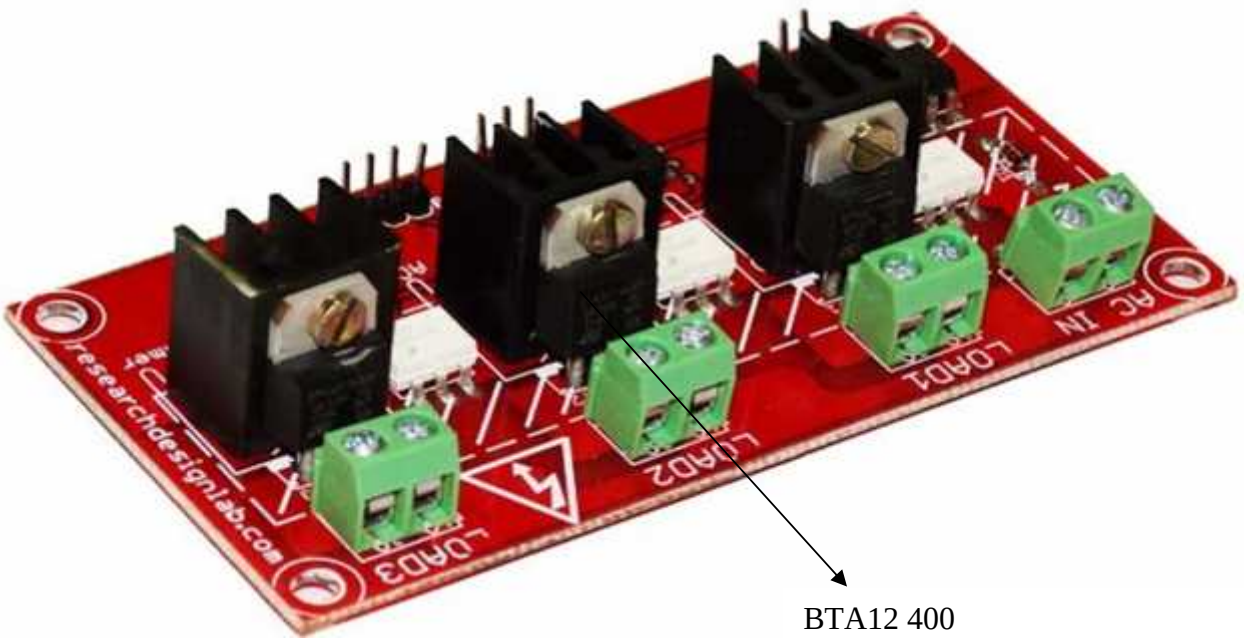
The board can be used in application where dimming of 110-220v AC power is required like dimming of bulb or fan.The board can be control with Serial data from any microcontroller 0-100% dimming or ON/OFF control Main power(230v) completely isolated from microcontroller.

FEATURES

- Works on AC power supply 230V.
- Load Capacity 12 Amp AC(Up to 2000 Watt)
- Isolated from mains power
- Works from any microcontroller input
- Serial Control (TTL).
- Simultaneous 3 load control with 0-100% dimming.
- Act as 3 channel solid state relay with ON/OFF and dimming.
- Optional input for Microcontroller or Bluetooth inteface pin TX,RX,5V,GND.

- Application software source code should be provided.

BTA12400 IC

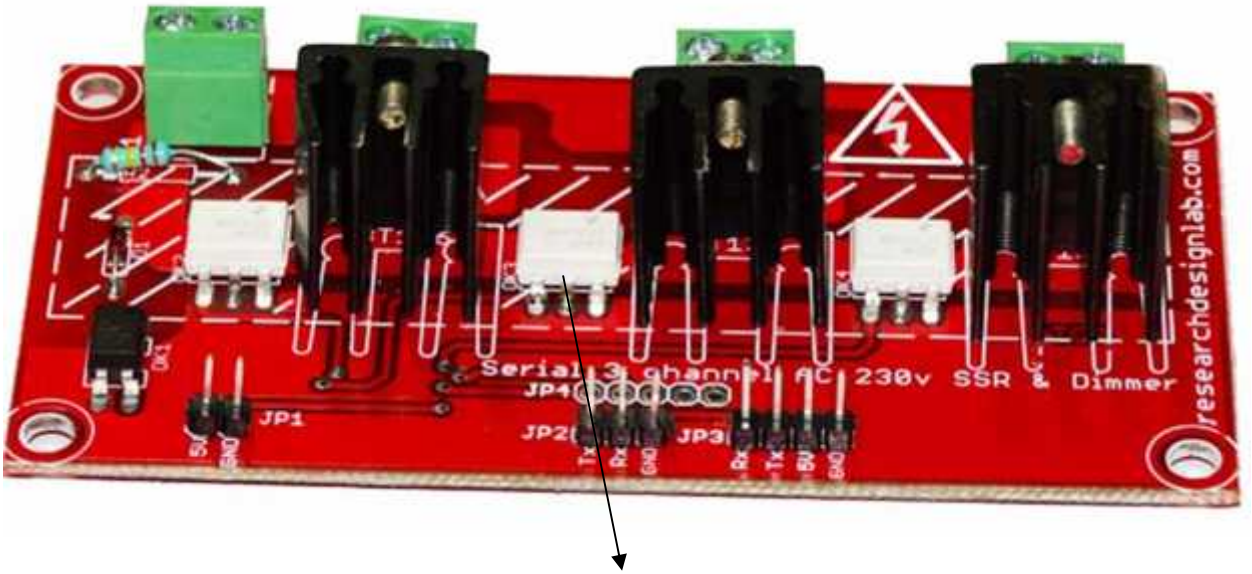


BTA12 400

Electrical Characteristics

- Average Power Dissipation of 0.5W
- Operating Temperature +120 degC
- Holding Current (maximum)-30mA
- Latching Current(maximum)-60mA

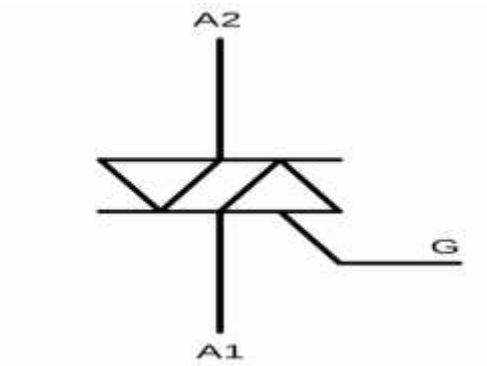
MOC 3021



MOC 3021

It is a 6pin Random Phase optoisolators TRIAC driver output

TRIAC



from Triode for Alternating Current, is a genericized tradename for an electronic component that can conduct current in either direction when it is triggered (turned on), and is formally called a bidirectional triode thyristor or bilateral triode thyristor.

Applications:

• Solenoid/Valve Controls

• Static ac Power Switch

• Lamp Ballasts

• Solid State Relays

• Interfacing Microprocessors to 115 Vac Peripherals

• Incandescent Lamp Dimmer

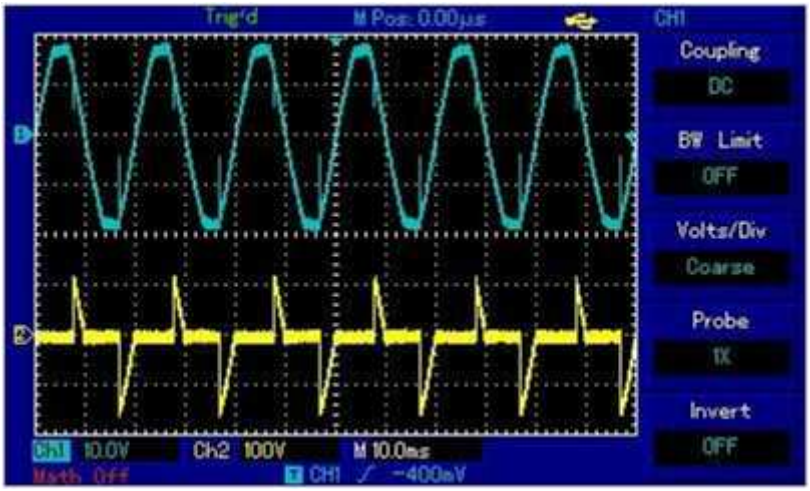
• Motor Controls

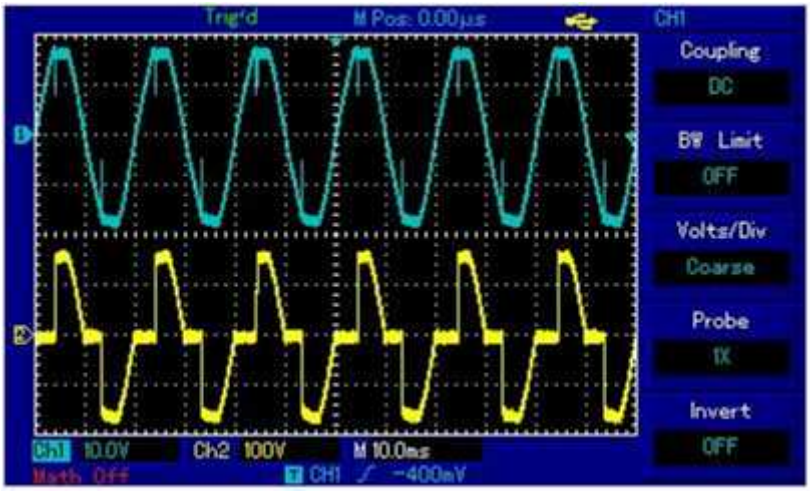
Electrical Characteristics

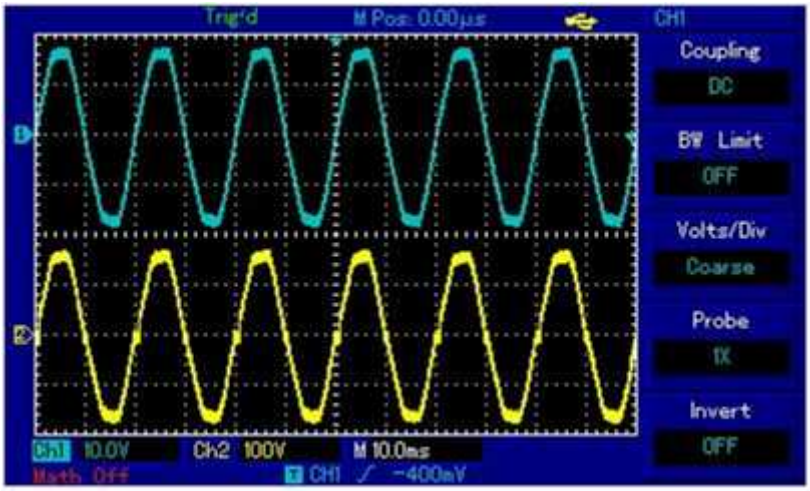
- Total Power Dissipation @ TA is 25°is 4.4mW
- Storage Temperature Range is -40 to +150 degC

FIRING ANGLE

Phase angle of applied voltage at which the Thyristor conduct




Trig'd
M Pos: 0.00µs
CH1
Coupling
DC
BW Limit
OFF
Volts/Div
Coarse
Probe
1X
Invert
OFF
CH1 10.0V
Ch2 100V
M 10.0ms
Math OFF
CH1 -400mV


Trig'd
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CH1
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Probe
1X
Invert
OFF
CH1 10.0V
Ch2 100V
M 10.0ms
Math OFF
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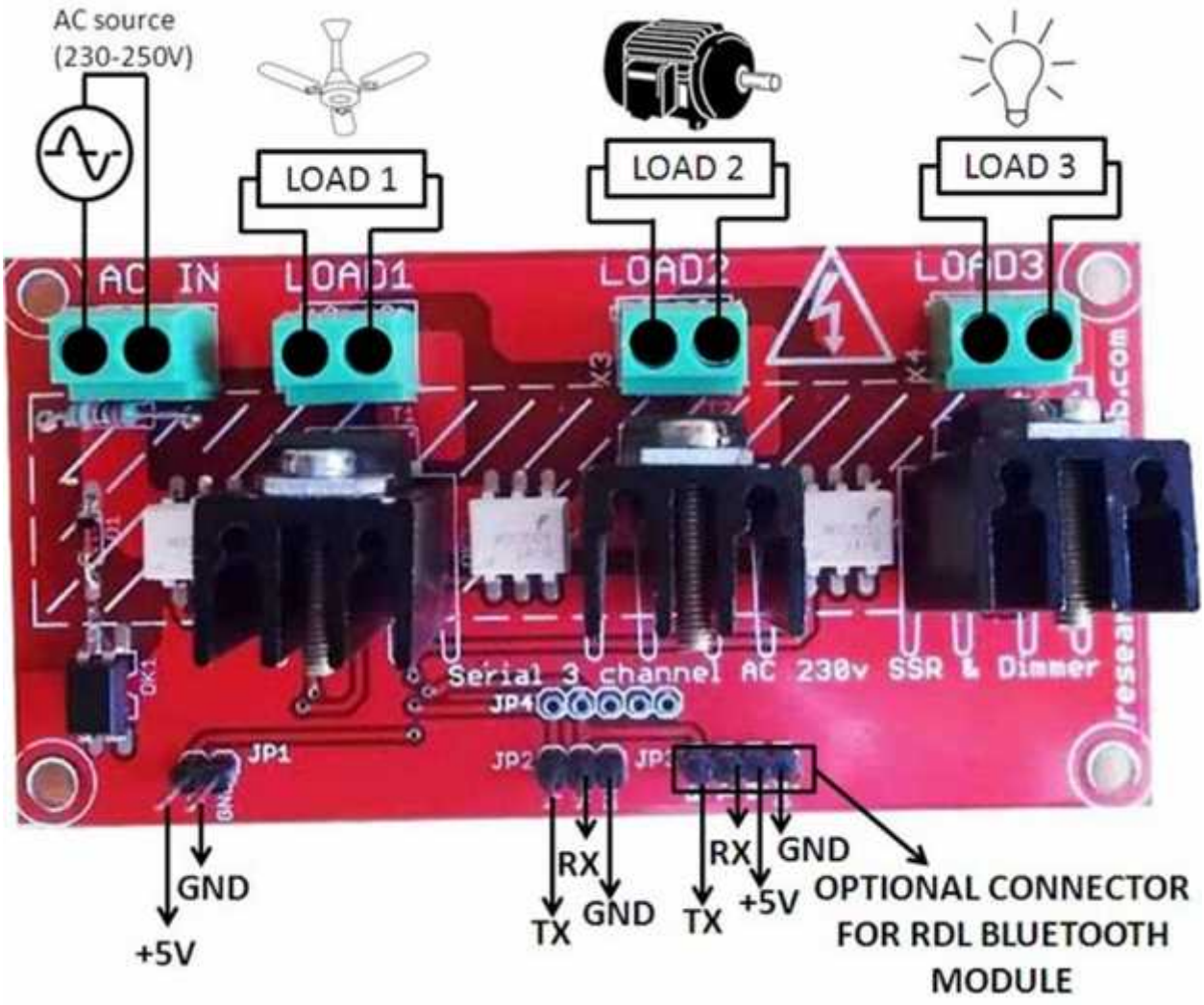
CONNECTING 230V AC DIMMER WITH ELECTRONIC GADGETS



UART INPUT FOR LOADS

A=load1

B=load2

C=load3

S=ALL OFF (LOAD1=OFF,LOAD2=OFF,LOAD3=OFF)

N=ALL ON (LOAD1=100%, LOAD2=100%, LOAD3=100%)

Example

A100= load1 at 100% dimmer level.

A026=load1 at 26% dimmer level.

B065=load2 at 65% dimmer level.

C089=load3 at 89% dimmer level.

LOAD1

	UART INPUT	DIMMER LEVEL
1	A100	100%
2	A090	90%
3	A092	92%
4	A050	50%
5	A010	10%

LOAD2

	UART INPUT	DIMMER LEVEL
1	B100	100%
2	B090	90%
3	B092	92%
4	B050	50%
5	B010	10%

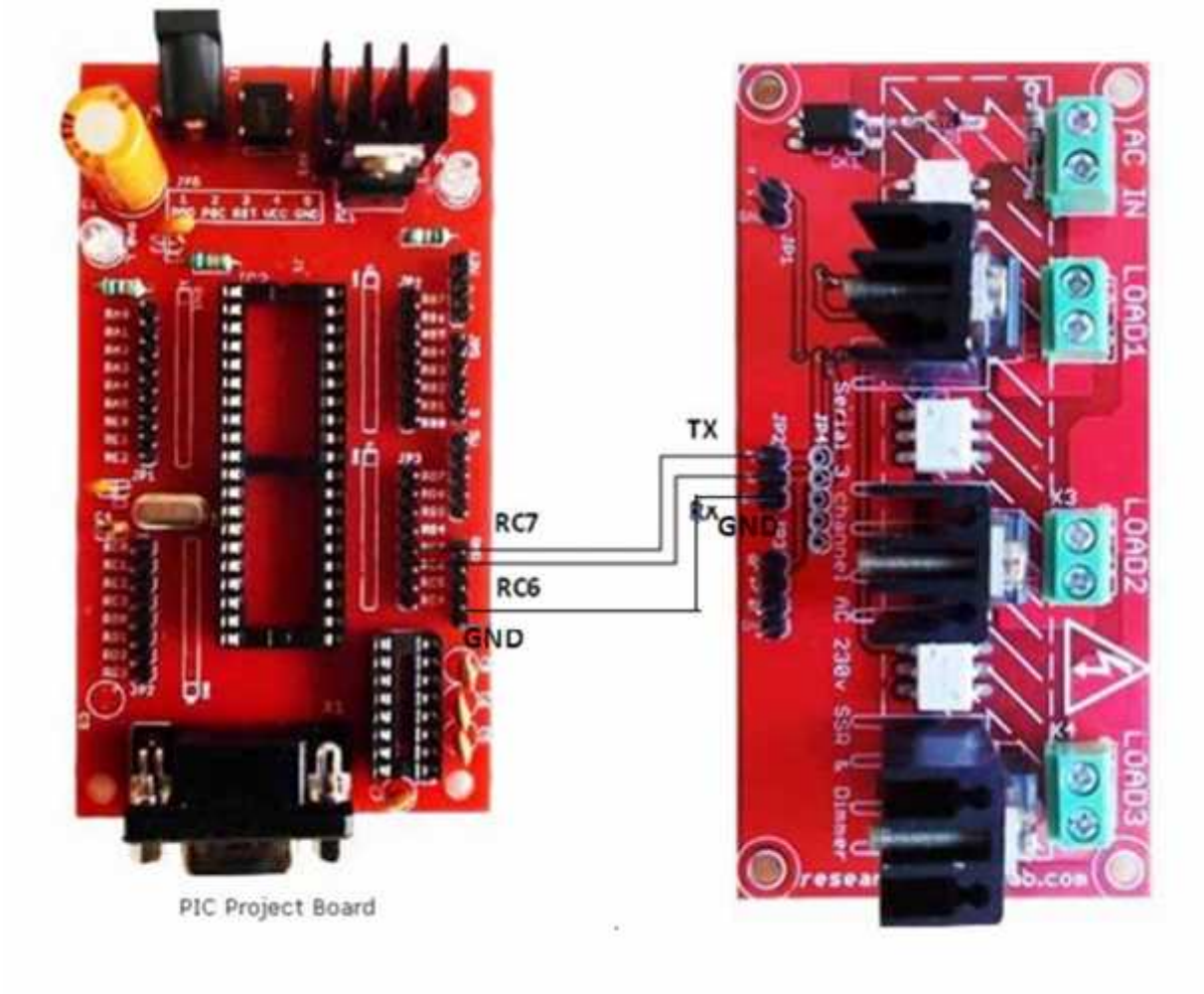
LOAD3

	UART INPUT	DIMMER LEVEL
1	C100	100%
2	C090	90%
3	C092	92%
4	C050	50%
5	C010	10%

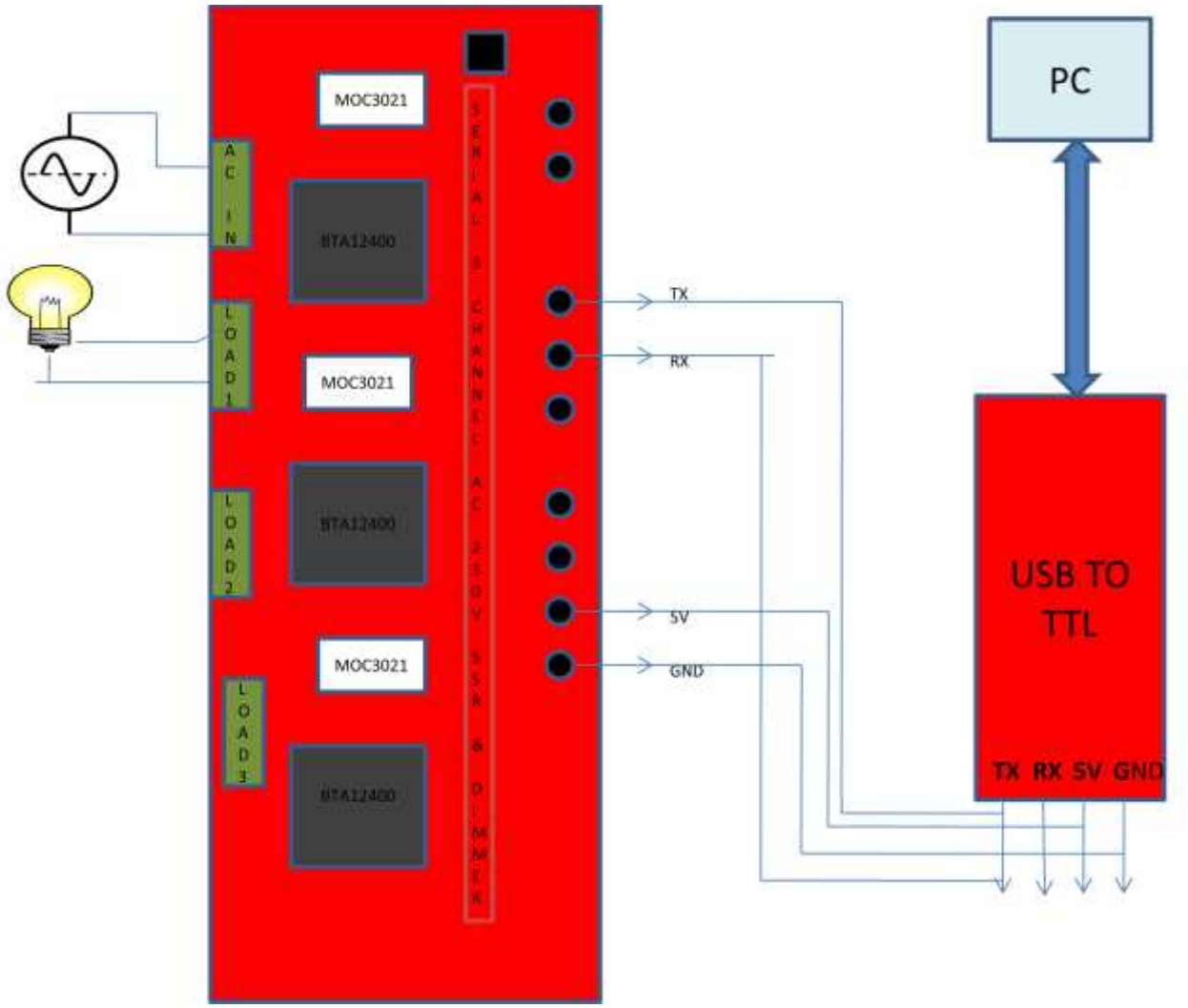
All ON and All OFF

	UART INPUT	DIMMER LEVEL LOAD 1,2,3
1	S	0%
2	N	100%

CONNECTING WITH PIC PROJECT BOARD



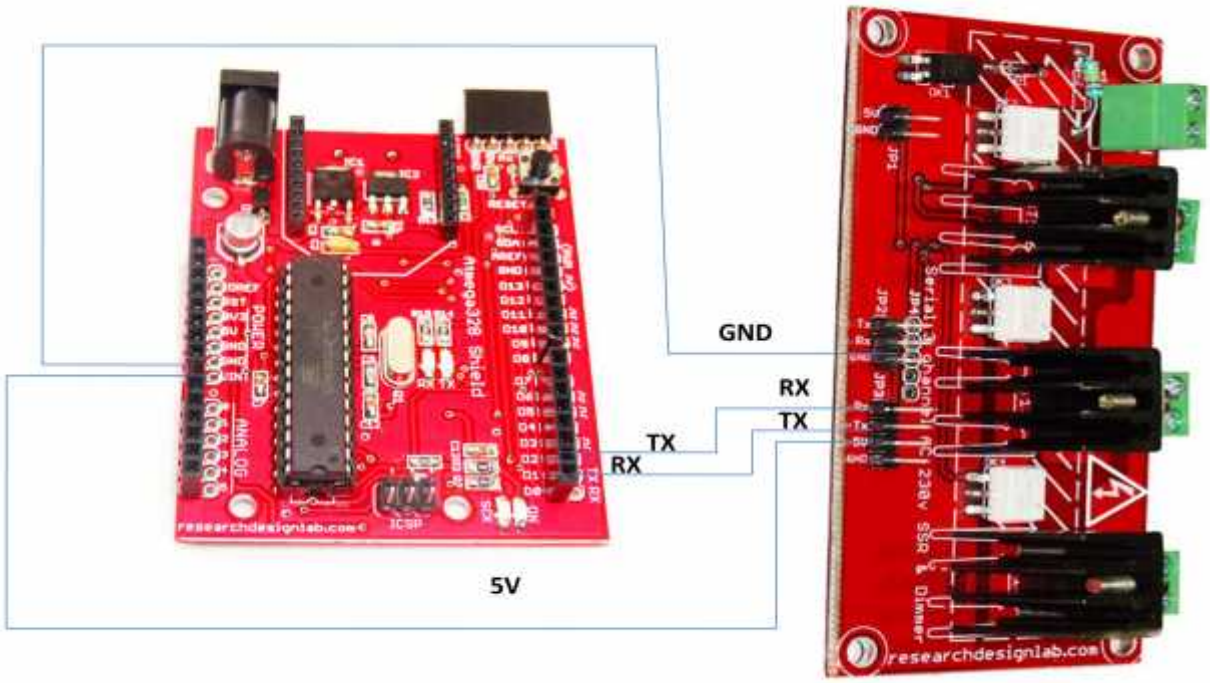
CONNECTION DIAGRAM



WORKING

- Make the connections as shown in diagram
- Connect PC and USB to TTL through USB cable
- Connect TX pin of Dimmer to RX of USB to TTL
- Connect RX pin of Dimmer to TX of USB to TTL
- Connect bulb to the Load 1
- Connect AC IN of Dimmer to power supply

CONNECTING 230V AC SSR & DIMMER WITH ARDUINO



ARDUINO CODE

```
int s1=8;                    //connect switch1 to pin 2 of arduino
int s2=9;                    //connect switch2 to pin 3 of arduino
int s3=10;                    //connect switch3 to pin 4 of arduino
int s4=11;                   //connect switch4 to pin 5 of arduino
int s5=12;                   //connect switch5 to pin 6 of arduino
```

```
int s6=13;

void setup()
{
  Serial.begin(9600);      // initialize the serial communications
  pinMode(s1,INPUT);
  pinMode(s2,INPUT);
  pinMode(s3,INPUT);
  pinMode(s4,INPUT);
  pinMode(s5,INPUT);
  pinMode(s6,INPUT);
}

void loop()
{
  unsigned char LOAD1=0,LOAD2=0,LOAD3=0;
   if(s1==LOW)
   {
     if(LOAD1<100)
     LOAD1++;
     Serial.write('A');
     CONVERT_DISPLAY(LOAD1);
     delay(500);
     }

    if(s2==LOW)
     {
       if(LOAD1>0)
        LOAD1--;
      Serial.write('A');
      CONVERT_DISPLAY(LOAD1);
      delay(500);
     }

   if(s3==LOW)
```

```
   {
     if(LOAD2<100)
     LOAD2++;
     Serial.write('B');
     CONVERT_DISPLAY(LOAD2);
     delay(500);
     }

     if(s4==LOW)
     {
       if(LOAD2>0)
        LOAD2--;
      Serial.write('B');
      CONVERT_DISPLAY(LOAD2);
      delay(500);
      }

  if(s5==LOW)
   {
     if(LOAD3<100)
     LOAD3++;
     Serial.write('C');
     CONVERT_DISPLAY(LOAD3);
     delay(500);
     }

     if(s6==LOW)
     {
       if(LOAD3>0)
        LOAD3--;
      Serial.write('C');
      CONVERT_DISPLAY(LOAD3);
      delay(500);
      }
}
```

```
void CONVERT_DISPLAY(unsigned int d)
{
   unsigned char dig1,dig2,dig3,dig[3];
   unsigned char x;
   unsigned char temp;
   temp=d;
   temp=temp/10;
   dig1=d%10;
   dig2=temp%10;
   dig3=temp/10;

        dig[0]=dig3;
      dig[1]=dig2;
      dig[2]=dig1;

      for(x=0;x<3;x++)
      {
          temp=dig[x]|0x30;
          Serial.write(temp);
    }
}
```

NOTE: Since this module working with live 230V AC, while experimenting user has to take proper safety precautions.