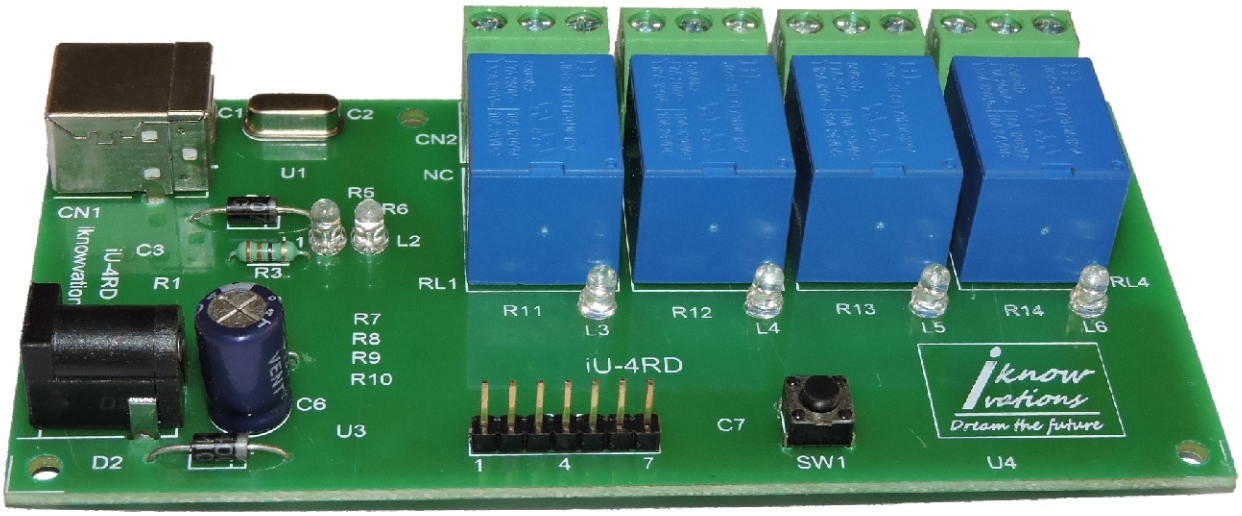
User Manual


C1
C2
CN2
U1
NC
R5
R6
CN1
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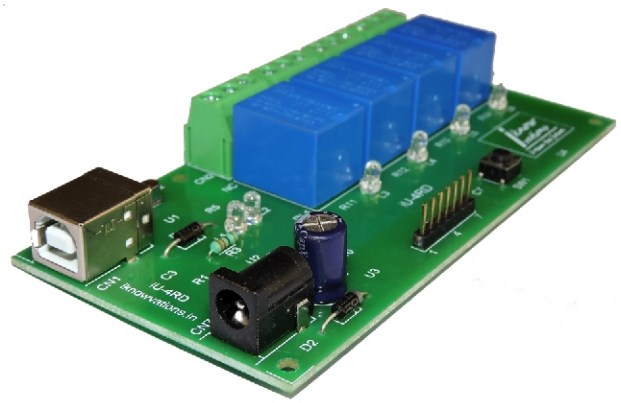
C3
R3
R1
RL1
R11
L3
R12
L4
R13
L5
R14
L6
RL4
R7
R8
R9
R10
iU-4RD
C6
U3
C7
SW1
U4
D2
1
4
7
Dream the future

4 channel USB Relay & DAQ Board : iU-4RD

Welcome to the world of Computer Automation. This USB Relay Board - iU-4RD is a perfect companion for all your computer automation projects. It is USB based card having 4 onboard relays for switching external devices and up to 5 Digital Input/Outputs and 2 Analog channels .

The Analog channels have 10 bit resolution for connecting many sensors to measure parameters like Temperature, Pressure, Humidity, Magnetic etc.

The board shows up as COM port to your PC (check in Device Manager) , which allows easy communication with the card. Any programming language that supports serial communications (C, C#, C++, VB, VB.NET, Perl, Java etc) can be used to communicate with iU-4RD very easily. Easy to use commands are available to communicate with iU-4RD for Switching On/Off of Relays and playing with Input/Output channels and Analog inputs.



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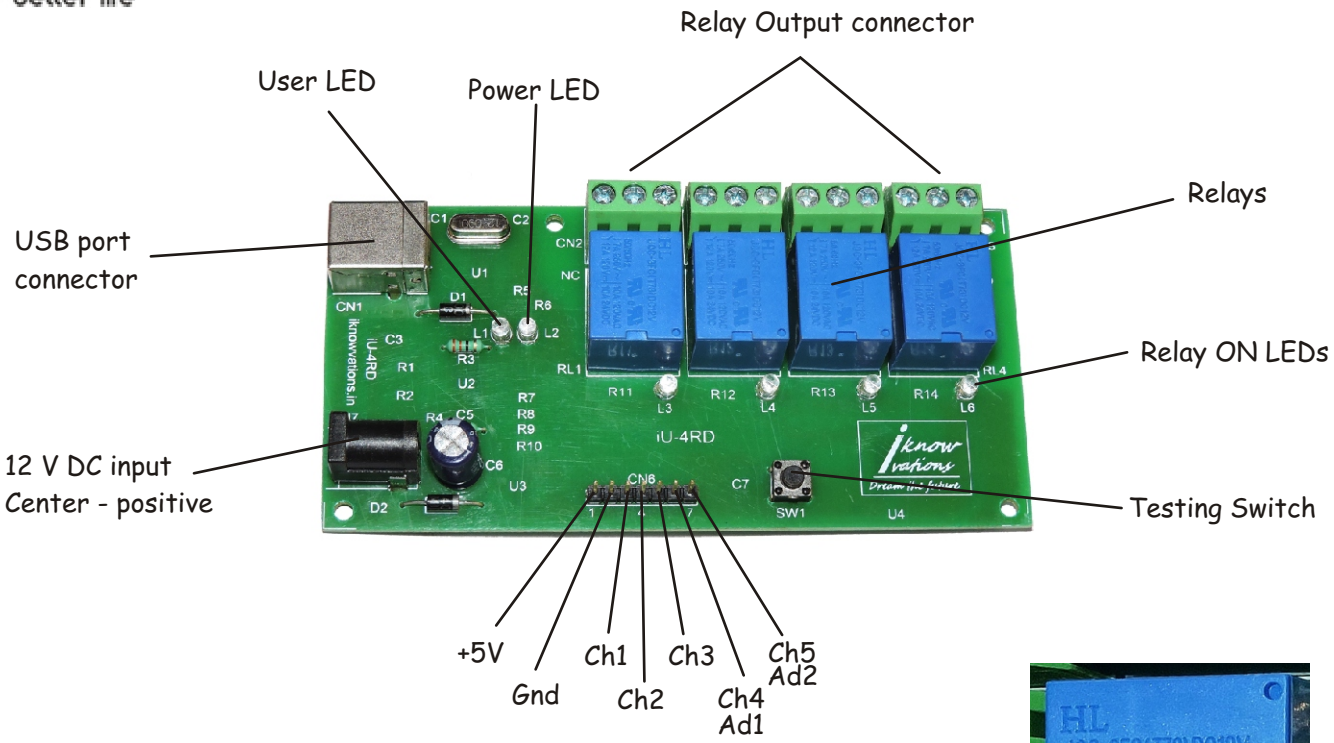
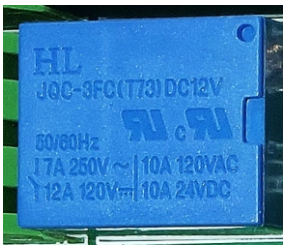




Technical Specifications -

No. Of Relays	-	4.
No. Of digital input/outputs	-	up to 5.
Digital outputs sink/source current	-	5 mA max. (current beyond this limit may damage the board)
No. Of Analog inputs	-	2.
ADC resolution	-	10 bits , 1024 counts.
ADC input range	-	0 to 5 V Dc.
Relay Specifications	-	Coil Voltage 12V Dc. Contact capacity - 5A Max.
Supply voltage	-	12 V Dc.
Supply Current	-	200 mA max.

Please Read Carefully before using the board

This device iU-4RD connects to USB port of your computer and can be used to control external devices through its relays. Incorrect use or faulty board can cause damage to controller itself or USB Port controller of your computer or Motherboard of your computer. **Extreme care should be taken while using this board. It will be totally user's responsibility for the use of this card.**

Arnin Automatica Pvt. Ltd., it's employees, suppliers, distributors, dealers and/or resellers are not liable to any kind of damage or loss of data as a result of use of this device, including special, incidental, or consequential damages resulting from the use of this device or under any legal theory, including loss of profits, downtime, goodwill damage to, or replacement of equipment or property and any cost for recovering or reproducing any data stored in computers connected with this device.

Your purchase and/or use of this board indicates your acceptance of these terms.

Installation -

1. First download the driver according to your OS from our download section at https://arnin.in/downloads/.
2. Run the software and follow the instructions.
3. Connect the board to your PC, it should be recognized by PC as CH340 Serial COM Port.

We will see here the procedure for Windows. Up to windows 8.x you will need driver while Windows 10 will recognize this as a simple USB COM port & will provide a COM port number. You can check it in Device Manager window of your PC.

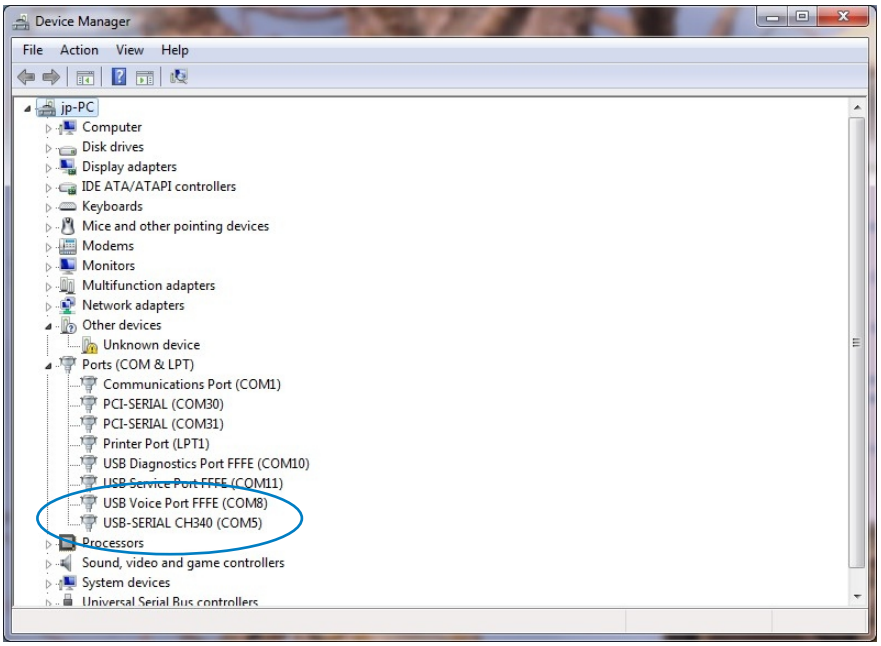
When you run the Windows setup program , you will get the following screen -

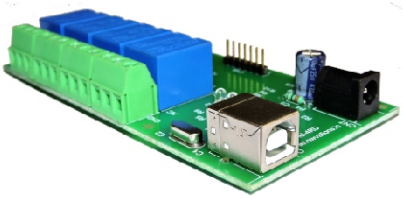
Press install button and it will install all the required drivers and you are done !

Life is easy hereafter ! Just connect the board & start to explore the board.

Start any serial communication software like HyperTerminal, choose the COM port of your card, make the setting 9800 8-N-1 and you are ready to go ! Enter some commands & the board will dance to your tunes ! Yes !

Don't make any sense ? Move to next page.





Command Reference -

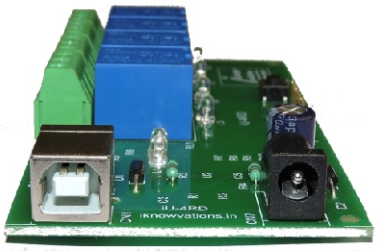
1. For Relay Outputs -

RL10 - Make Relay 1 Off.
RL11 - Make Relay 1 On.
RL20 - Make Relay 2 Off.
RL21 - Make Relay 2 On.
RL30 - Make Relay 3 Off.
RL31 - Make Relay 3 On.
RL40 - Make Relay 4 Off.
RL41 - Make Relay 4 On.

There are 2 additional commands for relays -

RLA0 - Make All Relays Off.
RLA1 - Make All Relays On.

2. For Digital Outputs-



SO11 Set Channel 1 Output to 1 -High.
SO10 Set Channel 1 Output to 0 -Low.
SO21 Set Channel 2 Output to 1 -High.
SO20 Set Channel 2 Output to 0 -Low.
SO31 Set Channel 3 Output to 1 -High.
SO30 Set Channel 3 Output to 0 -Low.
SO41 Set Channel 4 Output to 1 -High.
SO40 Set Channel 4 Output to 0 -Low.
SO51 Set Channel 5 Output to 1 -High.
SO50 Set Channel 5 Output to 0 -Low.

The board will respond with "Done."

3. For Digital Inputs -

GI01 Get Input value of Channel 01.
GI02 Get Input value of Channel 02.
GI03 Get Input value of Channel 03.
GI04 Get Input value of Channel 04.
GI05 Get Input value of Channel 05.

The board will respond with "0" or "1" depending upon input channel value, high or low

4. For ADC channels -

ADC1 Get AD value of Channel 1.
ADC2 Get AD value of Channel 2.

The board will respond with the pin's analog voltage value in 10 bits - (0 to 1024)

5. Miscellaneous Commands -

BORD - For the card Number.
VERS - For Firmware Version Number.
HELP - prints these menu commands.

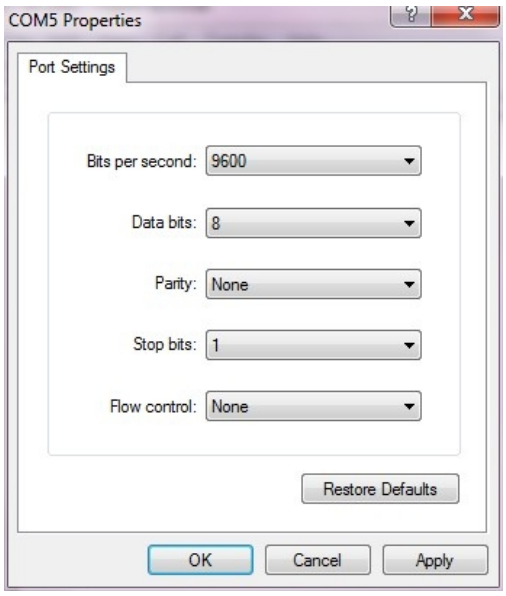
LED0 - Make User LED ON.
LED1 - Make User LED OFF.

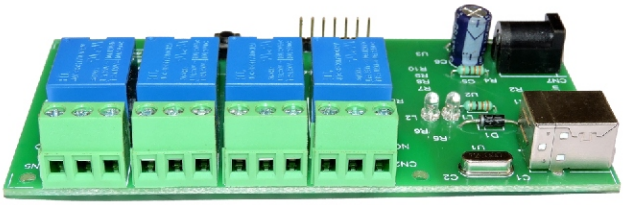
Any other command other then above will get "Unknown command ! " Response from the board.

Using the card - iU-4RD.

You can connect the card with USB cable having type A plug at one end and type B at other end. You have also to apply power 12 V Dc to Barrel connector (center +ve). By pressing SW1, all 4 relays will be ON. This is just for testing the relays. They will remain ON till the switch remain pressed.
You can communicate with the card through Hyper Terminal Software which generally every computer has pre installed or you can develop your own software using higher level languages like VB, VC, C# etc.

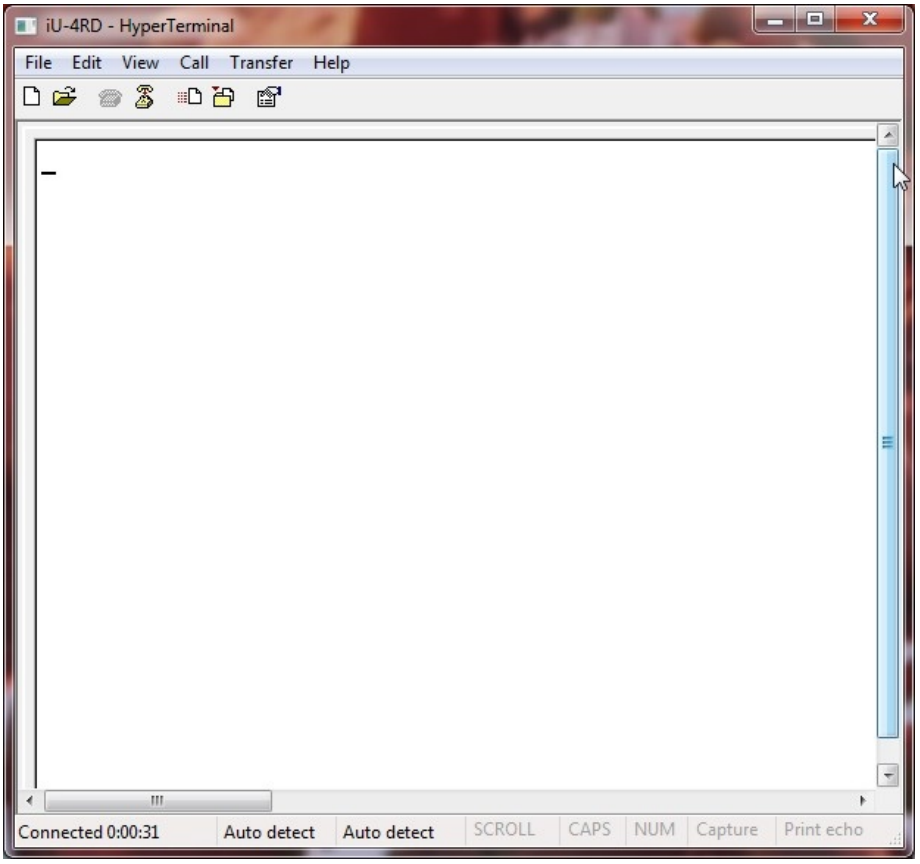
If you want to communicate with the card via HyperTerminal then start the HyperTerminal & set the COM values as per following screen shot. Set it to 9600 8-N-1.



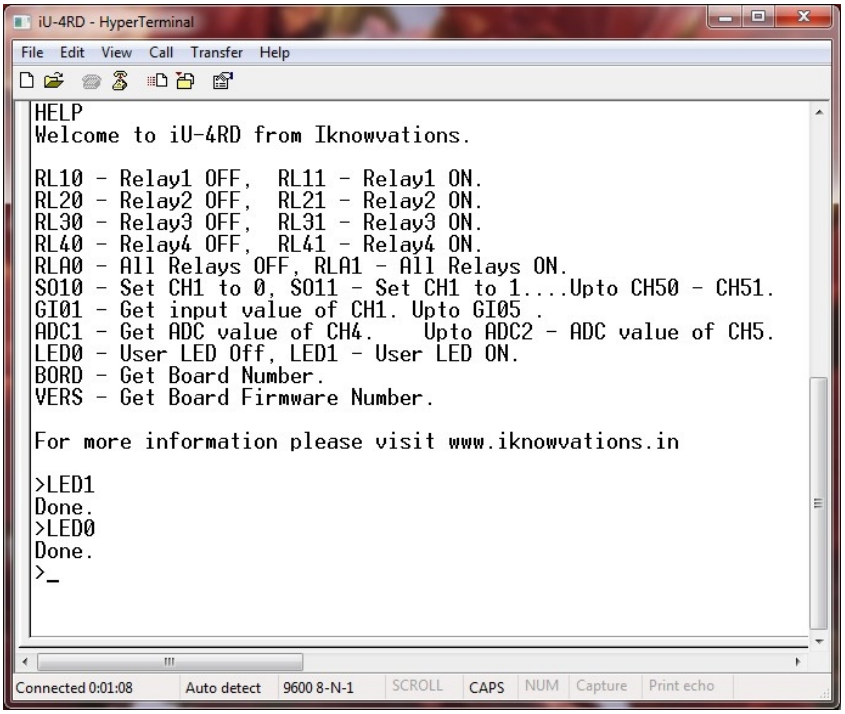


Select the com port as per your connection to the card.

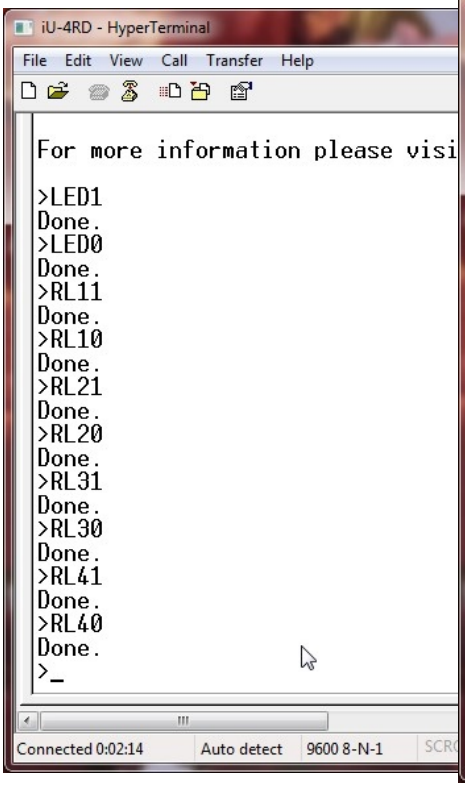
Apply the power to the card.

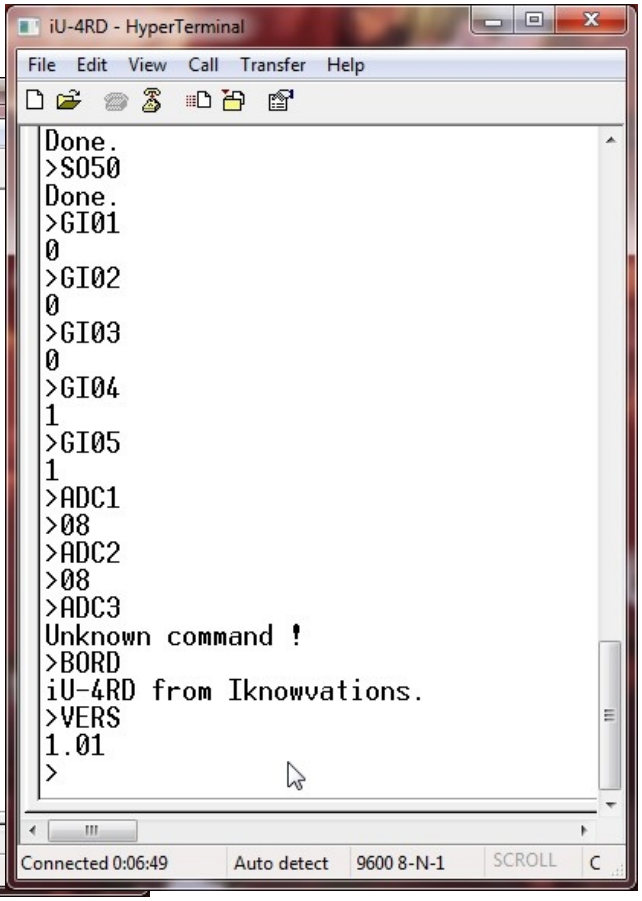


Type HELP and press Enter. This is the way to enter any command. Please note that all the commands are entered in CAPs followed by Enter button. HELP command shows all the available commands along with their short description.



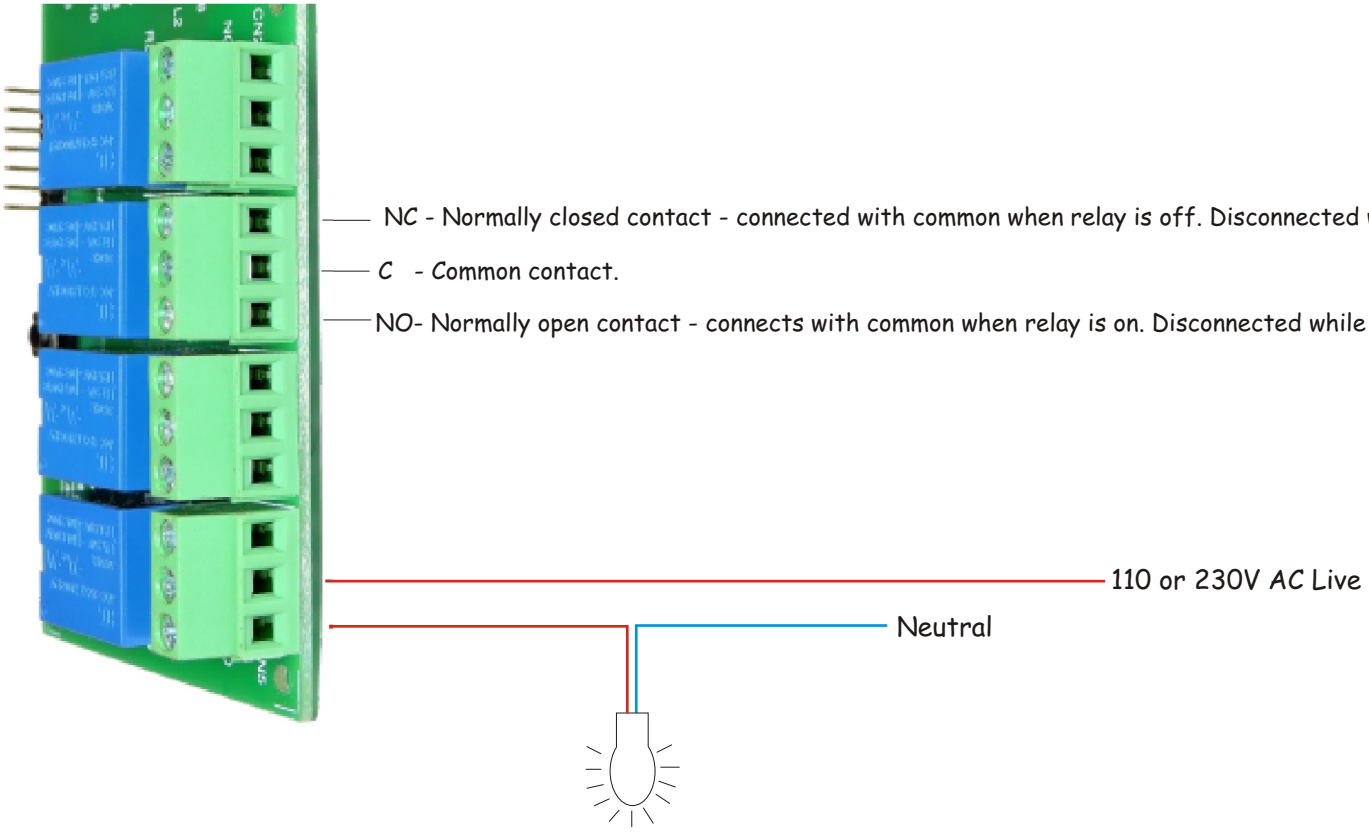
Screen shots showing various commands & response from the board.





Using Relay Outputs -

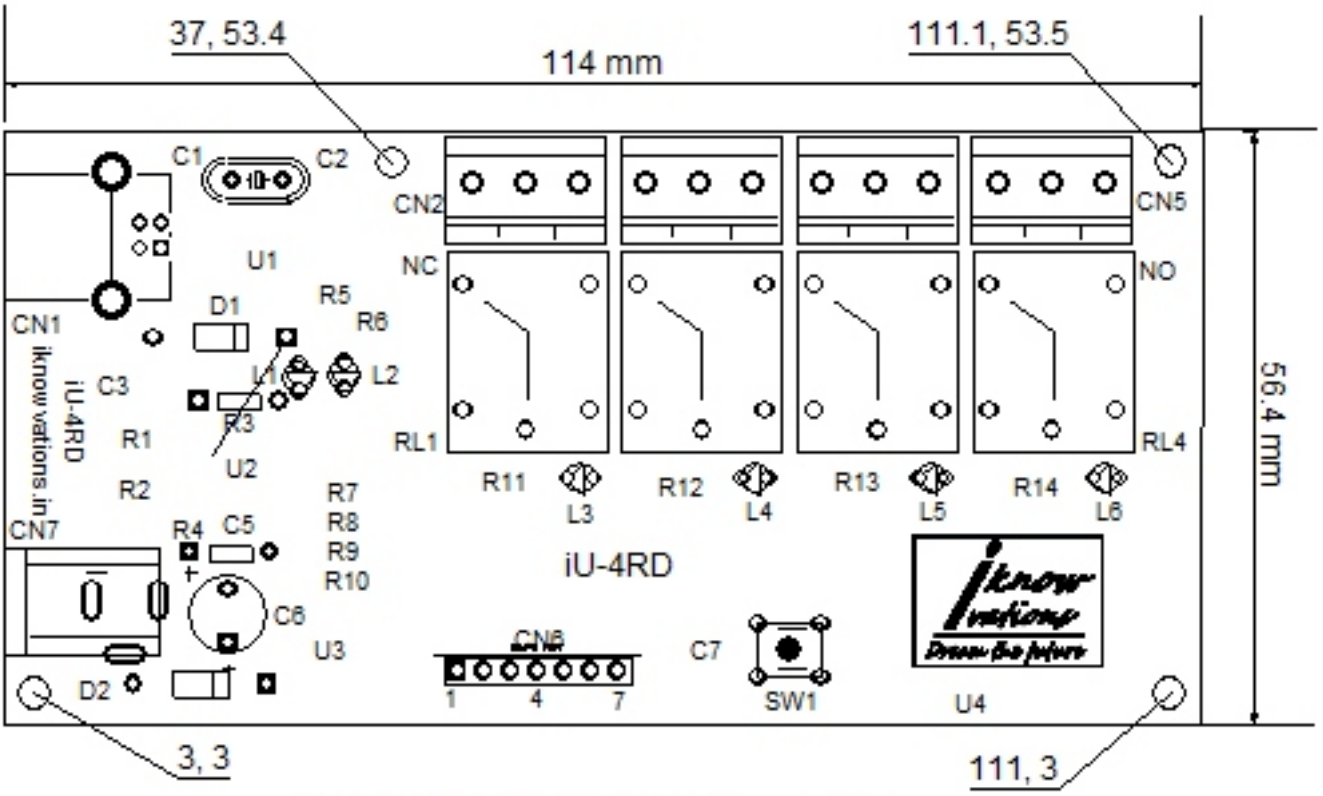
Relay outputs can be used to operate various electrical devices under software control. Extreme care should be taken if you are using 110 or 230 V AC. Arnin will not be responsible for any kind of damage or loss whatsoever to life or property. It will be totally user's responsibility.



Use of RC Snubber Circuit across relay contacts is recommended to avoid electrical interference. It is must when Relays are used to operate any inductive load like motor, coil, relay , transformer etc. The value of R - can be from 39 ohms to 1 Kilo ohms & C may be from 0.01 mf to 0.1 mf 400V.

The R & C is connected in series & both ends are connected across two relay contacts -Common & NC. The purpose is to absorb back EMF generated when the load is disconnected from supply. When relay is made off the energy stored in inductive load try to jump across relay contacts which results in sparks. This sparks across contacts not only damage the tip material but also induce noise to the power supply circuit. This noise may cripple functioning of micro controller used in circuit. So if you use any inductive load with this circuit, do connect RC Snubber Circuit across the relay contacts

Board Dimensions



All mounting holes are of 3 mm dia.

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