

FT245RL USB RELAY 4CHANNEL



ORDER CODE: RDL/4RB/14/001/V4.0

DOCUMENT VERSION: 2.0



- Switch off the supply voltage of this product as well as of attached devices before connecting or disconnecting them.
- Always use insulated tools while working.
- Do not touch any components of the board in open hand during power ON

Contents

1. INTRODUCTION	3
2. FEATURES	3
3. SPECIFICATIONS	4
4. APPLICATIONS	4
5. BLOCK DIAGRAM	5
a) USB 4 CHANNEL RELAY BOARD TO PC	5
b) USB 4 CHANNEL RELAY BOARD WITH RASPBERRY PI	5
c) RELAY APPLICATION WIRING DIAGRAM	6
d) RELAY APPLICATION WIRING DIAGRAM WITH DIGITAL SENSOR	6
6. ORDER INFORMATION TABLE	7
7. DOCUMENTS AND SUPPORT	8
a) Link to install driver for FT245RL	8
8. FT245RL UTILITY SOFTWARE	9
9. PROGRAMMABLE RELAY BOARD SOFTWARE	10
10. RASPBERRY PI SETUP	11
a) Steps /Instruction to be followed to control relay from Linux Pc or Raspberry Pi with Ubuntu/Raspbian	11
b) Steps to control the relay through Python Script in Windows	12
11. RELATED PRODUCTS	14

1. INTRODUCTION

This relay board with 4 SPDT relays and digital IO controlled via USB protocol, Suitable for home automation applications, hobby projects, and industrial automation. The free software application allows controlling relays manually or automatic operation by creating timers for each channel and enabling repeat cycle. Relay module support Windows & Linux platform, .Net / JAVA / Python SDK available for developing custom application.



2. FEATURES

- Completely opto isolated relay module
- LED indication for relay & power supply.
- 4x SPDT Relay (7A 250V, 12A 120V, 10A 125VAC, 10A 28VDC)
- 4x Digital IO 5v
- USB Control Chipset FT245RL
- Greater Power handling PCB 70 Micron with good quality screw Connector
- Relay Module Power supply selection available in 5V / 12V / 24 V.
- Configurable FIFO interface I/O pins.
- Data transfer rates up to 1Mbyte / second*
- Fully integrated USB termination resistors.
- Device supplied pre-programmed with unique USB serial number.
- USB 2.0 Full Speed compatible.
- Fully integrated 1024 bit EEPROM storing, device descriptors and FIFO I/O configuration

- Device supplied pre-programmed with unique USB serial number.
- Integrated power-on-reset circuit.
- -40°C to 85°C extended operating temperature range.
- .Net / JAVA / Python SDK available for developing custom application

* applicable for only Digital IO

3. SPECIFICATIONS

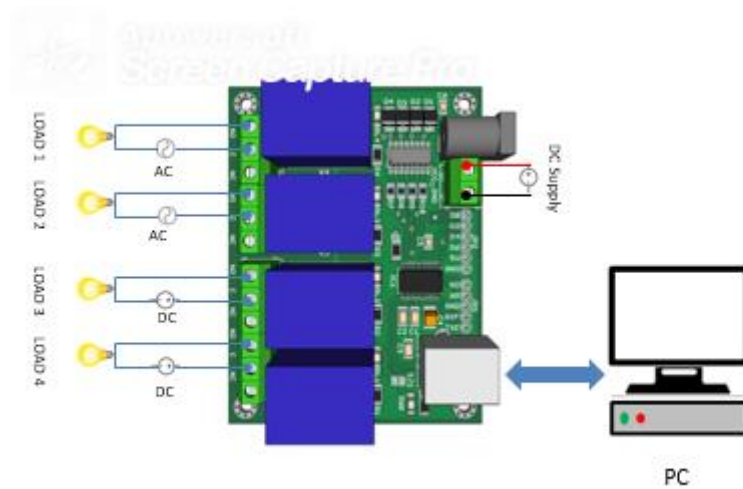
Specifications	
Max power consumption	300mA
Supply Voltage	5V/12V/24V *
Digital IO Data transfer Rate	1MBPS
Digital IO 5V	4x
Relay	4x , 7A
Relay Max Current	0.21A
Operating temperature	-40°C to 85°C
Opto Isolation	3700VRMS
LED Indication	Power supply & Relay ON
Dimension(L * W)	80MM * 60MM

4. APPLICATIONS

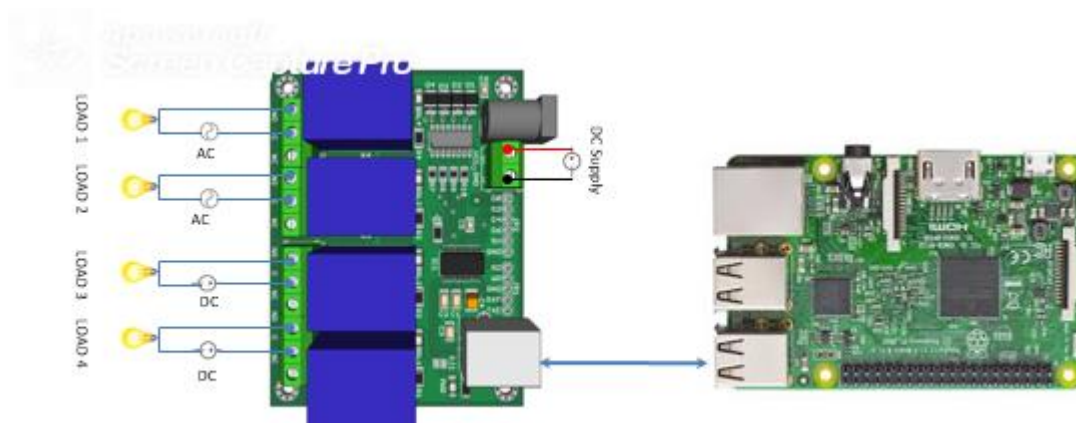
- Home automation
- Process Automation
- Vending Machine
- Gaming control system
- Robotics
- Alarms
- Timers
- Remote monitoring and controlling.
- ATM Security system
- Aquariums applications

5. BLOCK DIAGRAM

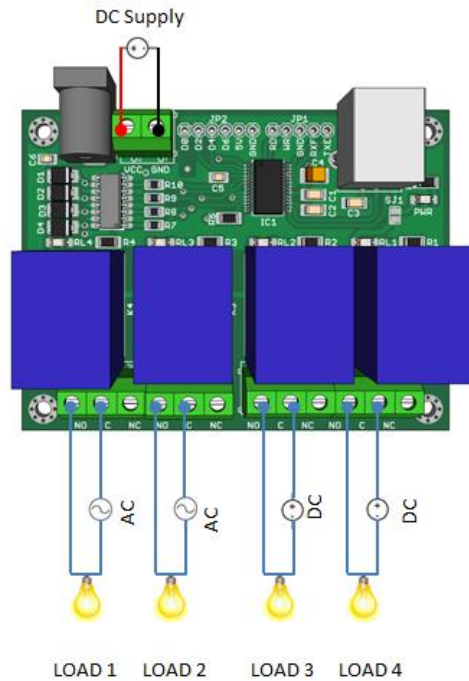
a) USB 4 CHANNEL RELAY BOARD TO PC



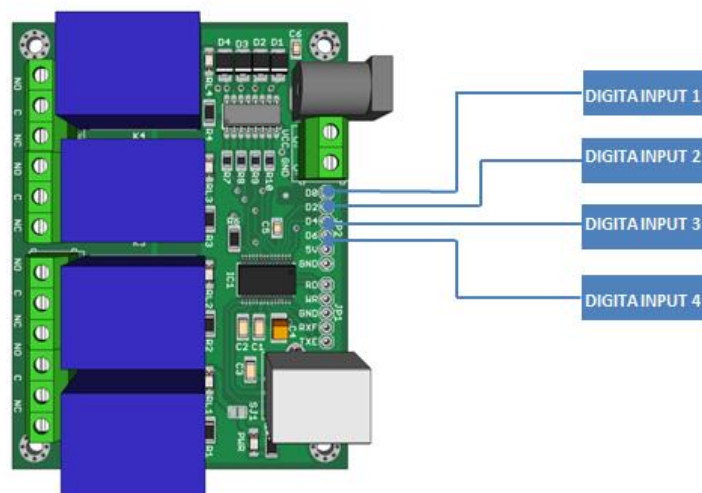
b) USB 4 CHANNEL RELAY BOARD WITH RASPBERRY PI






c) RELAY APPLICATION WIRING DIAGRAM



d) RELAY APPLICATION WIRING DIAGRAM WITH DIGITAL SENSOR



6. ORDER INFORMATION TABLE

ORDER CODE	IMAGE	RELAY TYPE & SUPPLY VOLTAGE
RDL/4RB/14/001/V4.0-5V RDL/4RB/14/001/V4.0-12V RDL/4RB/14/001/V4.0-24V		Supply Voltage:5v/12v/24v Relay Voltage : 5v/12v/24v Relay Amp :7A Type: Board level
RDL/4RB/14/001/V4.0-A5V RDL/4RB/14/001/V4.0-A12V RDL/4RB/14/001/V4.0-A24V		Supply Voltage:5v/12v/24v Relay Voltage : 5v/12v/24v Relay Amp :7A Type: Din rail
RDL/4RB/14/001/V4.0-B5V RDL/4RB/14/001/V4.0-B12V RDL/4RB/14/001/V4.0-B24V		Supply Voltage:5v/12v/24v Relay Voltage : 5v/12v/24v SSR Amp :4A Type: Board level with SSR

*Mention the Supply voltage during the order

7. DOCUMENTS AND SUPPORT

a) Link to install driver for FT245RL

<http://www.ftdichip.com/Drivers/VCP.htm>

b) Software examples- ftdi chip

<https://ftdichip.com/software-examples/>

c) Manuals

<http://www.dlpdesign.com/mprog35-ug.pdf>

http://www.ftdichip.com/Support/Documents/AppNotes/AN_130_FT2232H_Used_In_FT245%20Synchronous%20FIFO%20Mode.pdf

8. FT245RL UTILITY SOFTWARE

Features

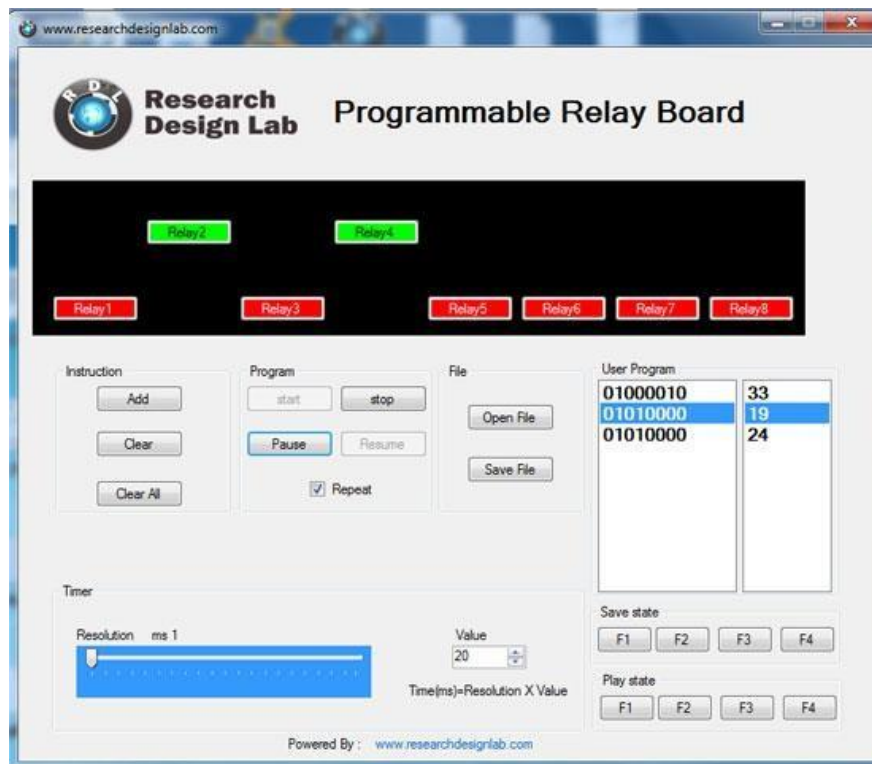
- On and off button provided to test onboard relays with status indication.
- Windows application.
- COM port will be automatically selected



To download FT245RL utility, go to the link given below

<https://researchdesignlab.com/projects/ft245rl32.rar>

9. PROGRAMMABLE RELAY BOARD SOFTWARE



Features

- Under instruction, one can add /clear relay states. For example, 01010000 means relay 2 and relay 4 will be turned ON and corresponding graphical view will be displayed.
- Setting the timer, time (ms) = resolution x value, this is the counter value set so that when a program is started, relays will be turned on/off for specified timer value.
- Programs can be stopped/resumed as well.
- One can save/open/play the program file(xxxx.rdl)

To download programmable relay board software, go to the link given below.

<https://docs.google.com/file/d/0BzrGD4zr88GnTjBPWTI4Mk9ZRFE/edit>

<https://researchdesignlab.com/projects/Programmable%20Relay%20Board.rar>

10. RASPBERRY PI SETUP

Instructions to install the libraries and test DR Control utility to control USB Relay board in Raspberry Pi board

a) Steps /Instruction to be followed to control relay from Linux Pc or Raspberry Pi with Ubuntu/Raspbian

Refer following link to install pylibftdi library

<https://pylibftdi.readthedocs.io/en/0.15.0/quickstart.html>

Relay Control Commands:

Relay ON commands:

R1: 0x01
R2: 0x02
R3: 0x04
R4: 0x08

Relay OFF commands:

R1: 0xFE
R2: 0xFD
R3: 0xFB
R4: 0xF7

Click on the below link for Python.py code

<https://researchdesignlab.com/projects/Python-script.zip>

b) Steps to control the relay through Python Script in Windows

Steps to be followed to control FT245RL USB Relay through python script in windows.

1. First install the USB driver by referring below link.

<http://embedded-funk.net/running-libftdi-under-windows/>

Use Zadig.exe to override the FT245RL Driver. Refer below link to do that.

<https://zadig.akeo.ie/>

2. Download libftdi from below link.

https://sourceforge.net/projects/picusb/files/libftdi1-1.1_devkit_x86_x64_21Feb2014.zip/download

3. Install Anaconda from

<https://docs.anaconda.com/anaconda/install/windows/>

(While installing don't forget to enable override current python installation environment variable --By enabling this option it will be directly set as environment variable. In order to avoid python version conflict you can uninstall the previously installed python versions or run it under virtual environment or you can use Anaconda prompt)

Locate your Python installation. [Default (for windows 10) C:\ProgramData.]

From libftdi1-1.1_devkit_x86_x64_21Feb2014.zip:(which is downloaded in step 2)

1. Copy **bin64\libusb-1.0.dll** to **c:\Anaconda3**
2. Copy **bin64\libftdi1.dll** to **c:\Anaconda3**
3. Copy **lib64\site-packages*** to **c:\Anaconda3\Lib\site-packages**
4. Connect the FT245RL Relay board.

Execute bellow command in Terminal.

```
python -m pylibftdi.examples.list_devices
```

If pylibftdi was not installed just install it.

pip install pylibftdi

This command will give the FT245RL device series Number

EXAMPLE: FTDI: FT245R USB FIFO:AC00LH65

In above example FT245RL device series Number is AC00LH65

Just use this Device Series Number in relay_control_pi.py python script

bb=BitBangDevice('AC00LH65') //replace the device series number(AC00LH65) with that of your FT245RL Relay board.

Now you can use the relay_control_pi.py python script to control relays by Using relay_on(rel_num,bitbangDeviceObject) and relay_off(rel_num,bitbangDeviceObject) functions

Note: The relay on off commands are byte values based on bit masking.

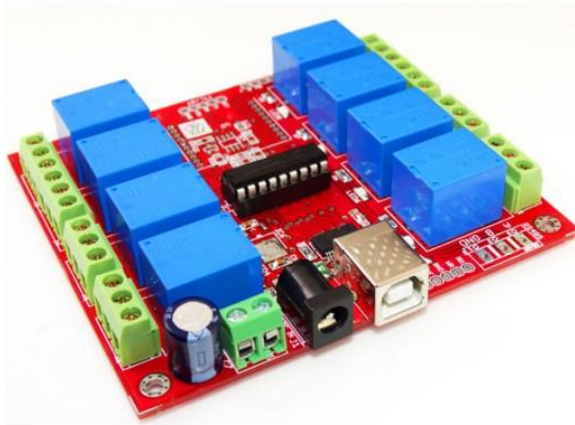
Ex: relay_on_cmds=[0x01,0x02,0x04,0x08]

relay_off_cmds=[0xFE,0xFD,0xFB,0xF7]

Please click the link below for C# SDK file for USB 8/4 Channel Relay-FT245RL
https://drive.google.com/drive/u/0/folders/1-dXmpsdFiXycxrcYSd1rPDy_Io97FY8L

11. RELATED PRODUCTS

USB 8 Channel Relay Board-FT245RL



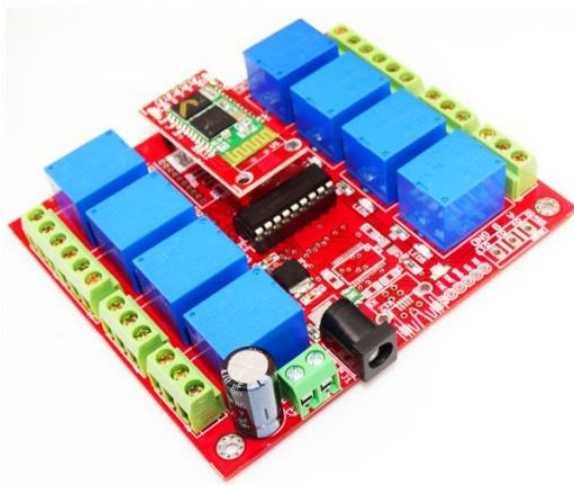
ORDER CODE: RDL/8RB/14/001/V2.0

8 Channel Relay Board-RS485



ORDER CODE: RDL/8RB-R/14/001/V1.0

8 Channel Relay Board-Bluetooth



ORDER CODE: RDL/8RB/14/001/V1.0

8 Channel Relay Board- Serial



Order Code: RDL/8RB-S/14/001/V1.0

Wi-Fi - 8 Channel Relay Board ESP8266



ORDER CODE: RDL665

DIN Rail Opto Isolated Relay



ORDER CODE: RDL775