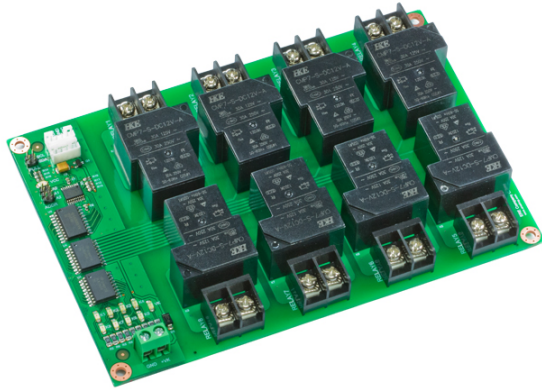


# I2C-RL812L, I2C-RL812LA

## I2C-Bus 8-Relay Heavy Current



### Features

- PCF8574 and PCF8574A I2C-Bus Controller
- 8 relays
- 100kHz bus frequency
- Address by 3 jumpers for use of up to 8 boards
- Up to 16 boards on one bus
- Compatible with most microcontrollers
- Board input voltage, 2.5V - 5.5V
- Relay input voltage, 12V
- Inverse polarity protection circuits
- 30A 240Vac/24Vdc contact rating
- PCB size fits on DIN-Rail mount supports
- Board size 107x160mm

### Descriptions

These are heavy current relay boards designed for very big loads. They have 8 relays on board and each one can turn on/off load current up to 30A. Also there are 8 LEDs to show status of the relays. The relays require input voltage 12V. All of relays are controlled via I2C bus which the board has I2C bus controller, PCF8574(PCF8574A).

The PCF8574 and PCF8574A are the I2C bus controllers which talk to microcontroller and then take commands to the relays. The PCF8574 and PCF8574A support 100kHz bus frequency. And they can be connected to 2.5V - 5.5V external logic. This means that, they can be connected to many microcontrollers that have 2.5V - 5.5V logic voltage of I2C port.

The boards are addressed by 3 jumpers to make 8 different addresses. So that 8 boards can be connected together on one bus. Moreover 16 boards can be connected together on one bus when they have 16 different addresses. By this way, 8 boards of the PCF8574 and 8 boards of the PCF8574A can be connected together on one bus. Because the PCF8574 doesn't have same address as the PCF8574A.

Normally, when the I2C bus works at 100kHz. It need 10K pull-up resistors at SCL and SDA lines. On the board, there are 2 jumpers for enable/disable the pull-up resistors.

All of input voltages have inverse polarity protection circuits to prevent damage from a mistake of connection. And have LEDs to show status of those input voltages.

Board has a PCB size fits on 107x160mm DIN-Rail PCB mount supports. So that the board can be installed on DIN-Rail easily. Din-Rail is the most use of enclosures for industrial.

Board Diagram

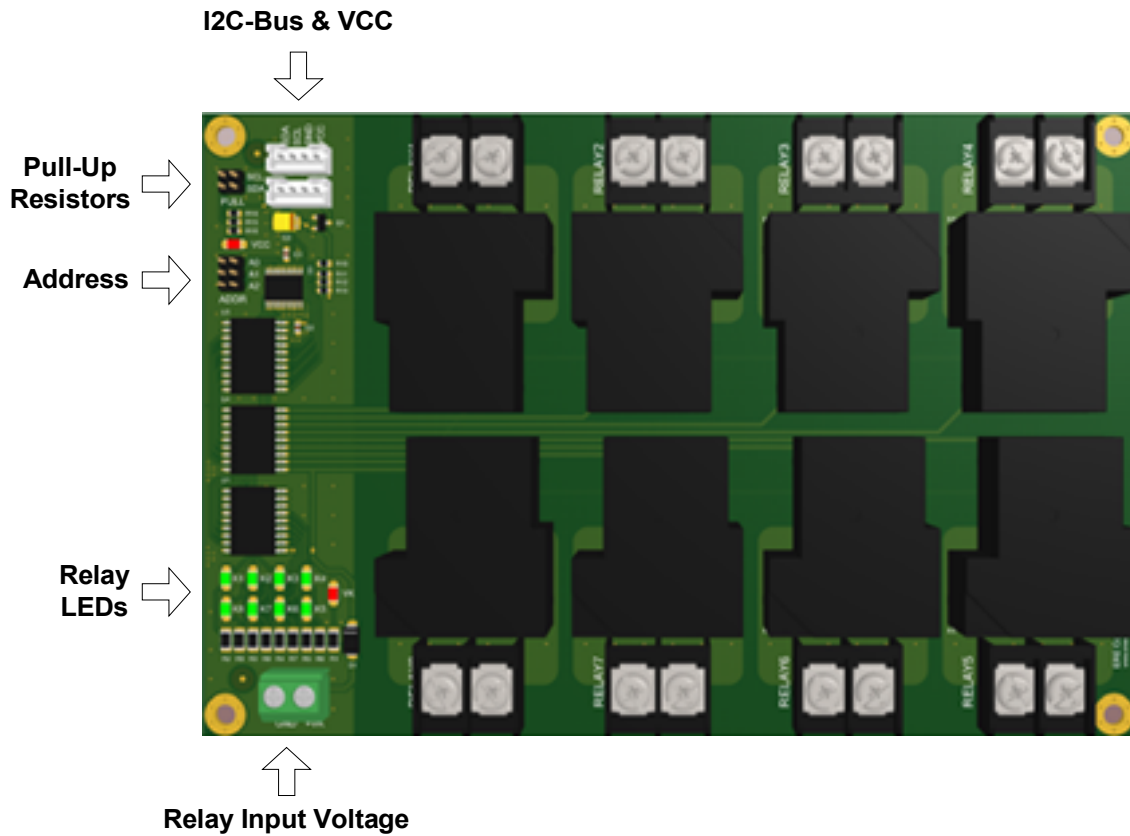


Figure 1: Board Diagram

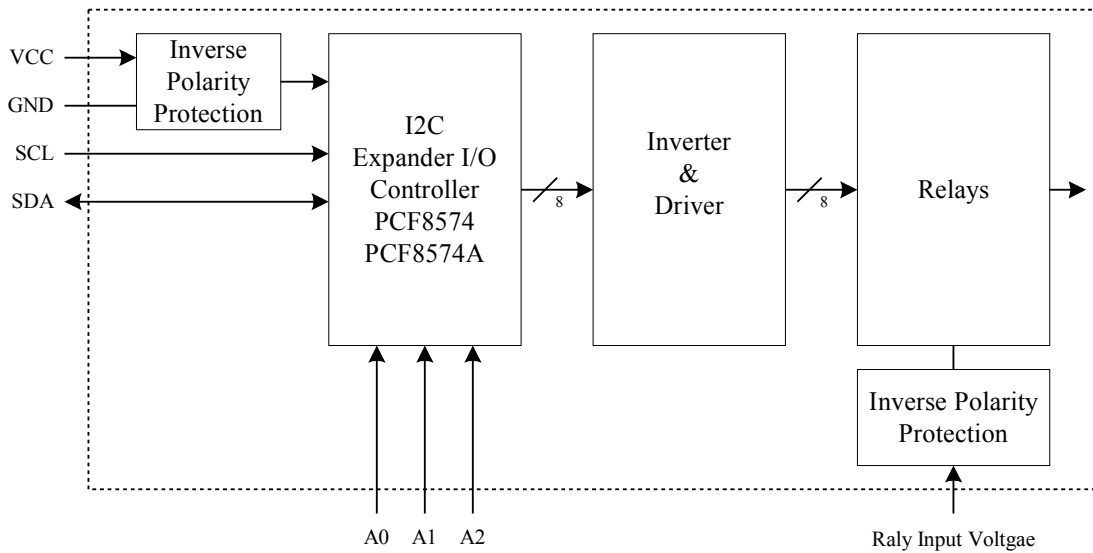


Figure 2: Block Diagram

### Board Connectors

There are 2 connectors for I2C bus signals and board input voltage. The 2 connectors are same pins. They are 4-pin 2.00mm connectors. The pins are VCC, GND, SCL and SDA.

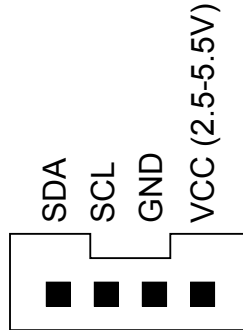


Figure 3:  
Connectors

### Board Input Voltage

The VCC and GND need input voltage 2.5V-5.5V and there is LED to indicate voltage status. Also board has an inverse polarity protection circuit to prevent damage from a mistake of connection

### Bus Signals

There are 2 signals for I2C bus, SCL and SDA. They must be connected to SCL and SDA of microcontroller respectively.

### Pull-Up Resistors

The board has 2 jumpers to enable or disable pull-up resistors for SCL and SDA lines. Be carefully, only one resistor on SCL line and only one resistor on SDA line are enabled. Disable all of pull-up resistors on relay boards if there are pull-up resistors on microcontroller board. One bus need only two resistors, one for SCL line and another one for SDA line.



Enable Pull-Up Resistors

Disable Pull-Up Resistors

Figure 4: Jumper for Pull-Up Resistors

### Bus Address

There are 3 jumpers to make 8 different addresses. So that 8 boards can be connected together on one bus. Moreover 16 boards can be connected on one bus when they have 16 different addresses. This mean that 8 boards of the PCF8574 and 8 boards of the PCF8574A can be connected together on one bus. Because the PCF8574 doesn't have same address as the PCF8574A.

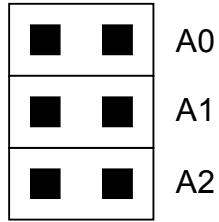


Figure 5: Address Jumpers

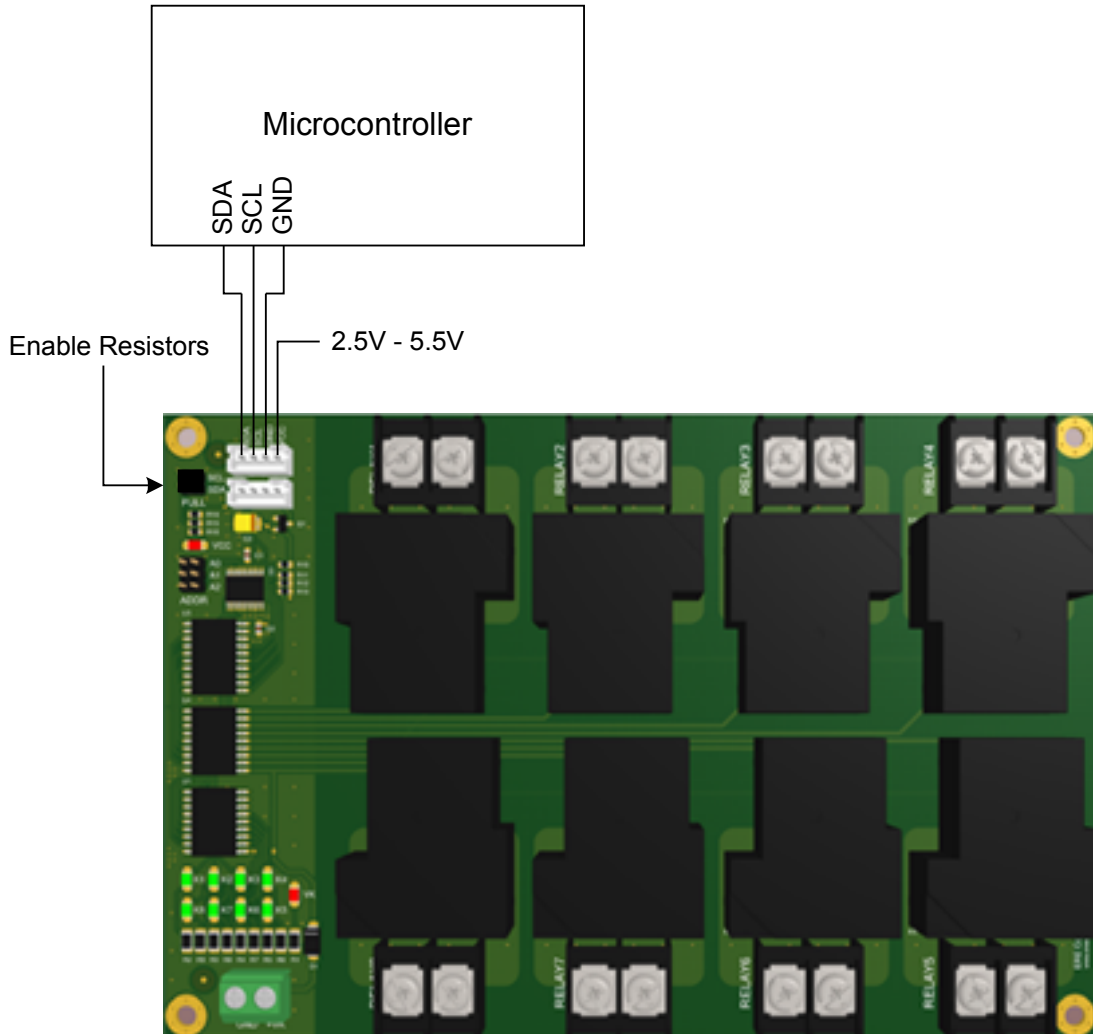
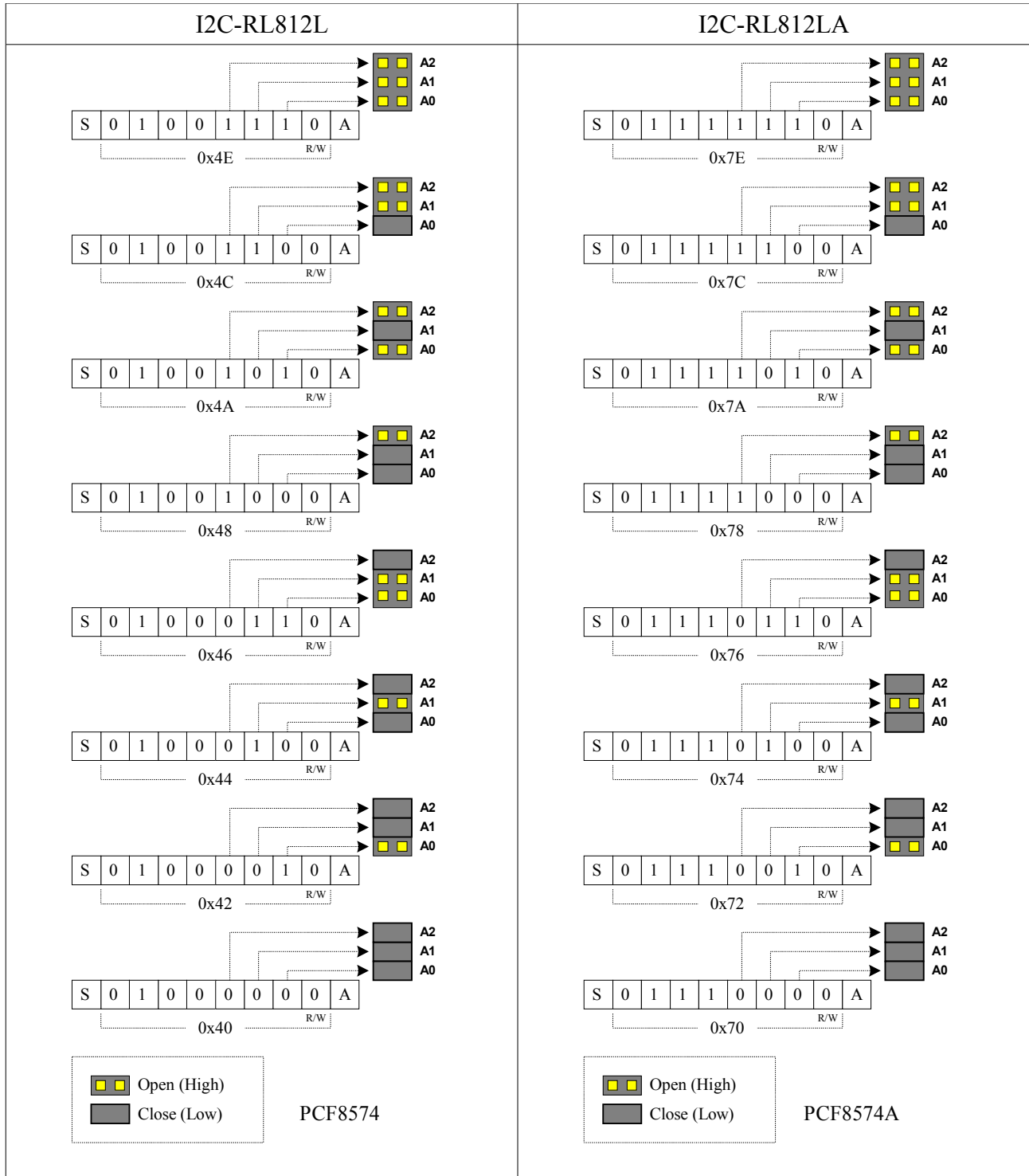


Figure 6: Interface to Microcontroller



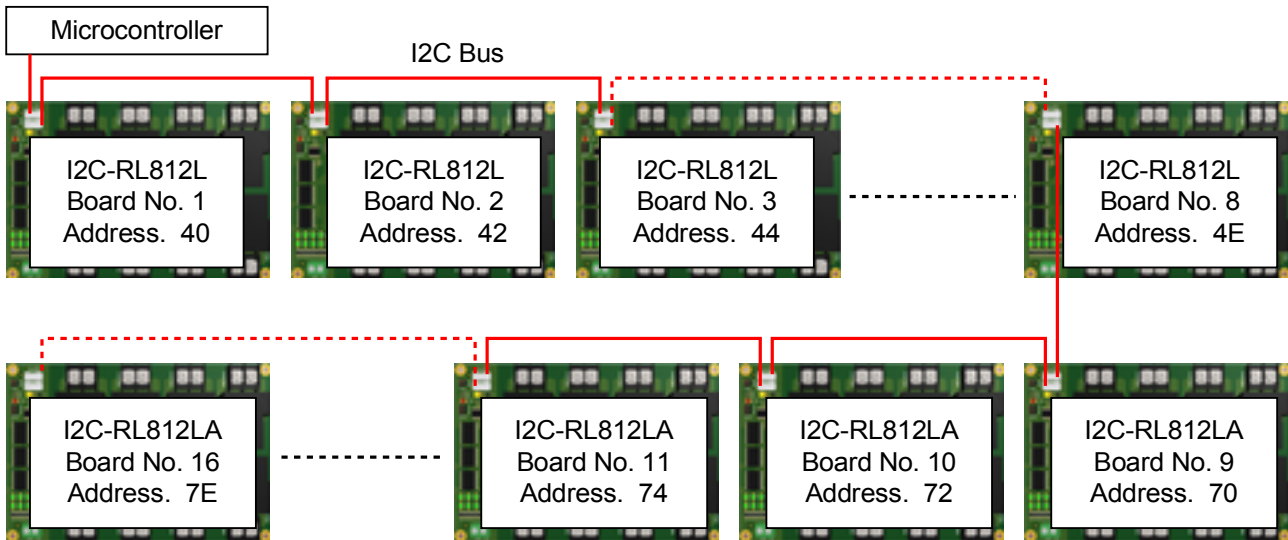


Figure 7: Up to 16 Boards

### Relay Input Voltage

Relays need input voltage 12V. LED will be turned on when voltage is applied to relay input voltage connector. Also there is inverse polarity protection circuit to prevent damage from mistake of connection.

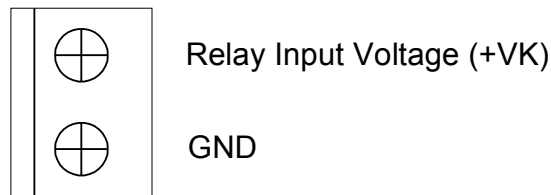


Figure 8: Relay Input Voltage

### Relay Connectors

There are relay connectors for each one. The connector pins are NO and COM. Each relay can drive current up to 30A at 240Vac or 24Vdc.

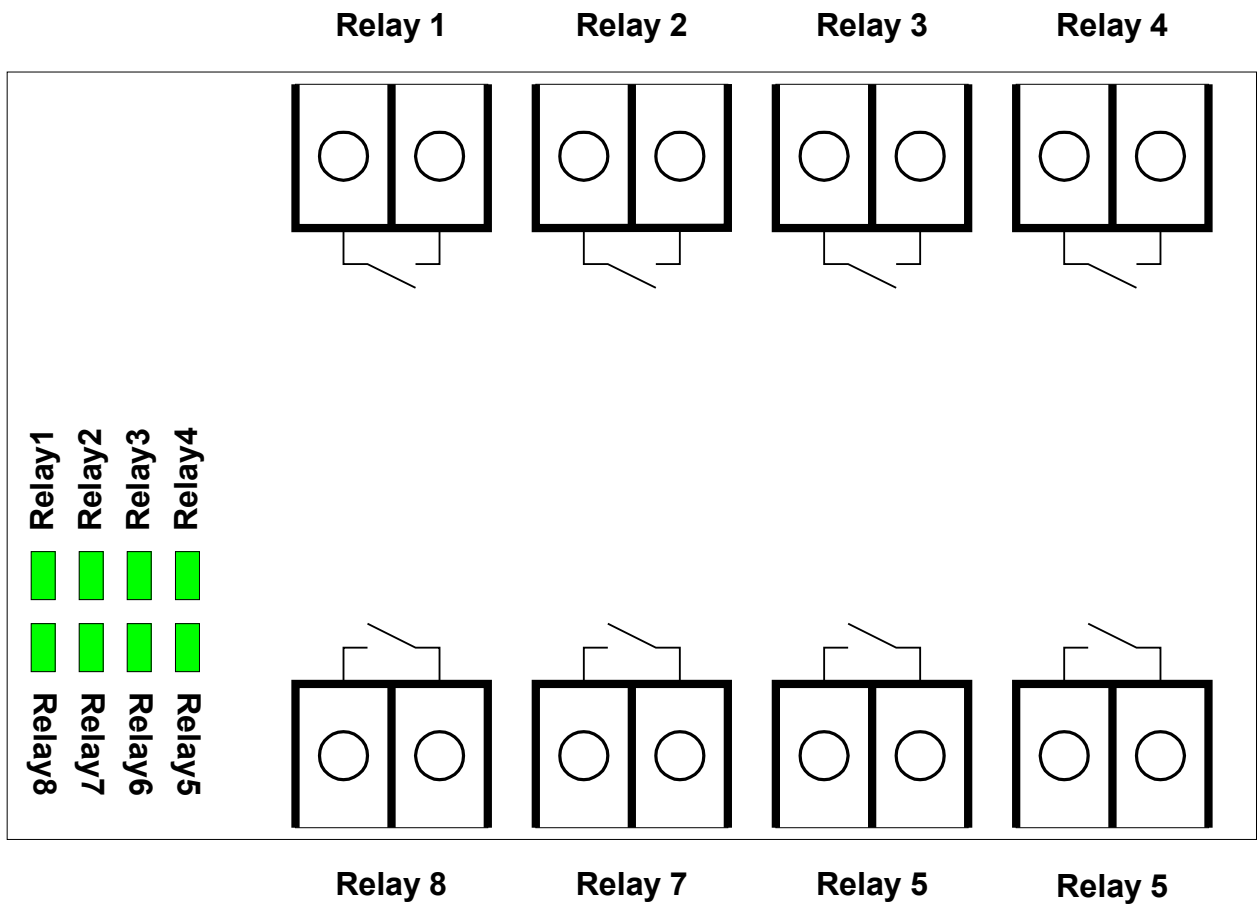
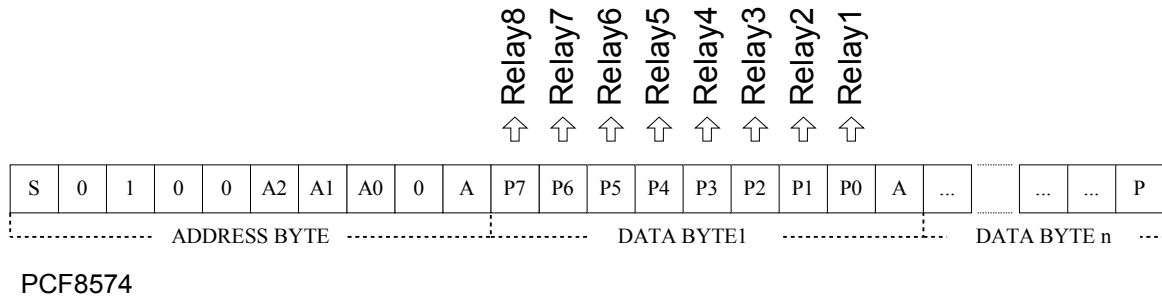


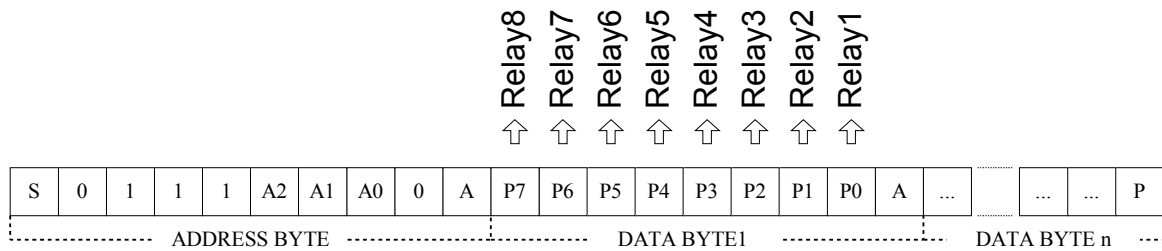
Figure 9: Relay Conectors & LEDs

### Data Frame of Relays

When sending data from microcontroller to relay board via I2C bus. The first byte is address byte which compose of 7-bit of address and 1-bit of R/W. The second byte is data for relays. The Bit0 of the second byte controls relay1. Bit value '1' means relay off and bit value '0' means relay on.



PCF8574



PCF8574A

Figure 10: Relay Data Frame of PCF8574 and PCF8574A

### Specifications

Bus speed	100Khz
Maximum board on one bus	8(16) boards
Bus logic voltage	2.5V-5.5V
Board input voltage	2.5V-5.5V
Relay coil voltage	12V
Relay contact rating	30A 240Vac/24Vdc
Relay channels	8

	I2C-RL812L	I2C-RL812LA
Max Bus Freq	100KHz	100KHz
Logic voltage	2.5V - 5.5V	2.5V - 5.5V
Relay voltage	12V	12V
Chip	PCF8574	PCF8574A



Board Dimensions

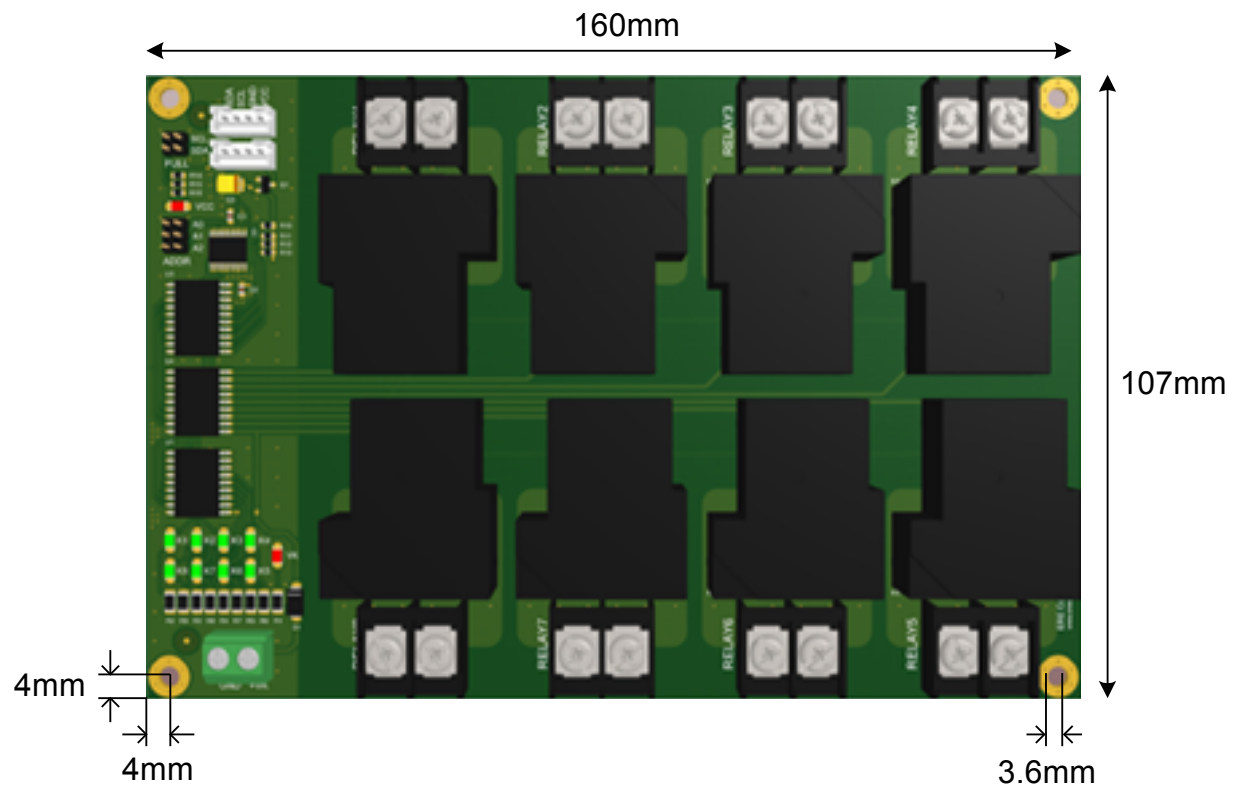


Figure 11: Size of Board