I2C-RL812M, I2C-RL812MA
I2C-RL824M, I2C-RL824MA
I2C Bus 8-Relay Boards

Features
- 8 Relays
- PCF8574 and PCF8574A
- 100kHz I2C bus frequency
- Address by 3 jumpers for use of up to 8 different addresses
- Up to 16 boards on one bus
- Board input voltage 2.5V-5.5V
- Relay input voltage 12V, 24V
- Contact rating 10A 120Vac/24Vdc or 6A 250Vac
- Compatible with most microcontrollers
- Inverse Polarity Protection circuits
- PCB size fits on DIN-Rail mount supports
- PCB size 72x87.5mm

Descriptions
These are I2C bus relay boards. The boards for remote 8-relay expander for I2C bus based on PCF8574 and PCF8574A. Making it ideal as relay outputs expander for I2C bus.

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.

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 72x87.5mm 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.

The relays require input voltages 12V and 24V depending on board models. The relay contact rating is 10A at 120Vac/24Vdc or 6A at 250Vac.

Board diagram

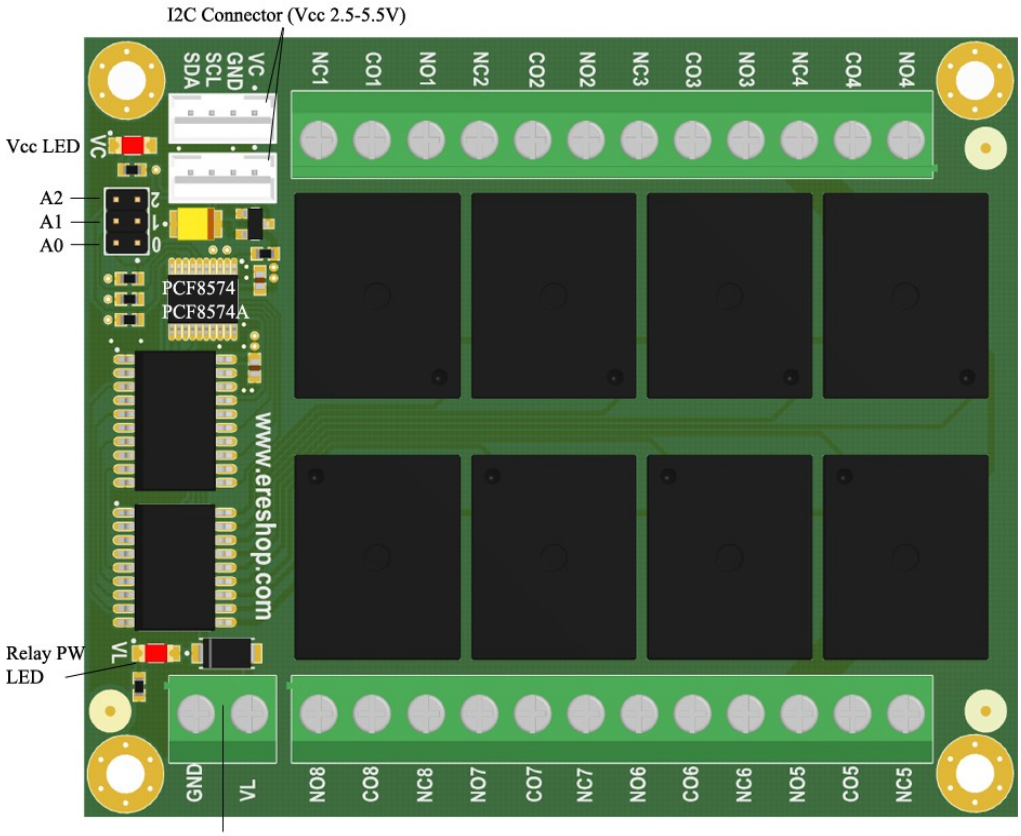

Figure 1: Board Layout

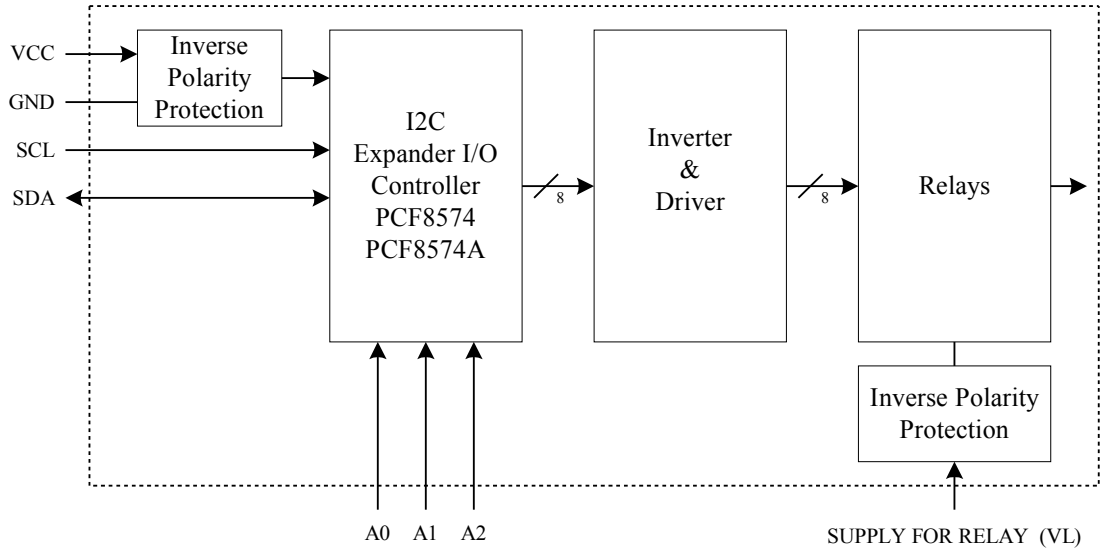

Figure 2: Block Diagram

Board Connectors

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

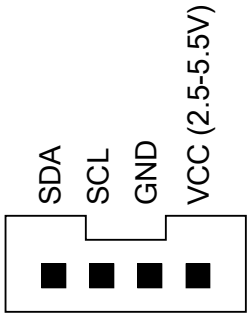

Figure 3: Connector

Board Input Voltage

The VCC and GND need input voltage 2.5V-5.5V and there is a LED to indicate status of voltage. 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

When the I2C bus is working at 100khz bus frequency. It need 10K pull-up resistors for SCL and SDA lines. Then two 10K resistors must be connected to SCL and SDA pins to VCC.

Interface to Microcontroller

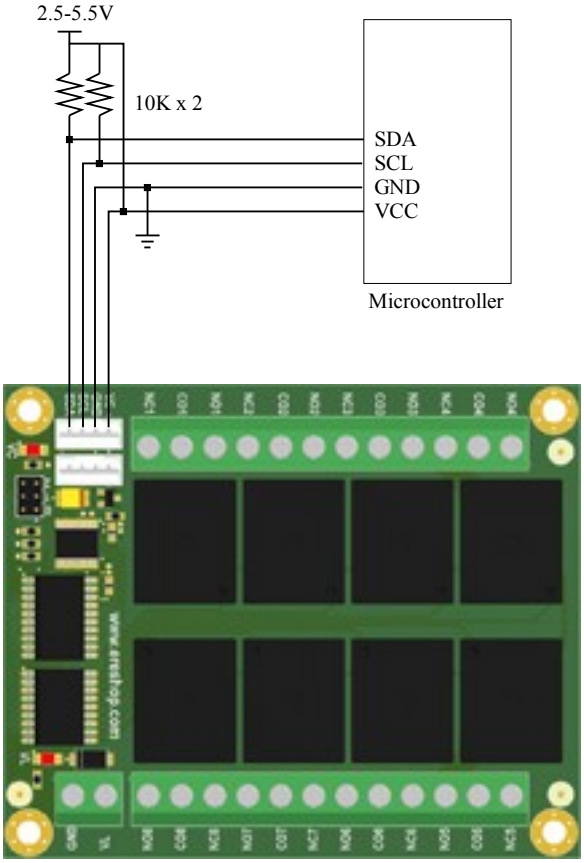

Figure 4: Interface to Microcontroller

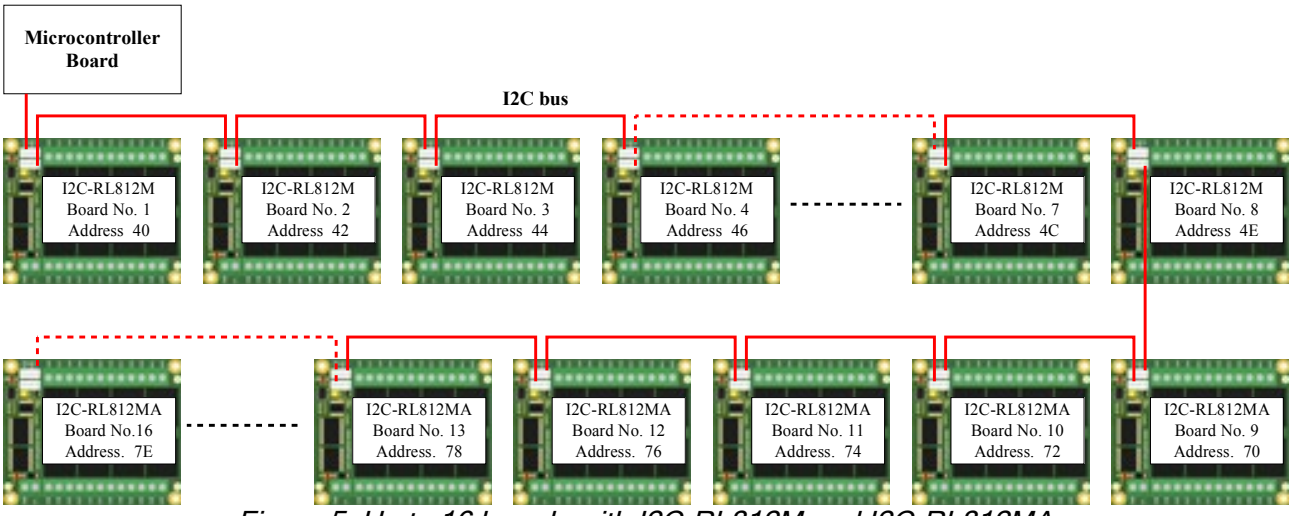

Figure 5: Up to 16 boards with I2C-RL812M and I2C-RL812MA

Addressing

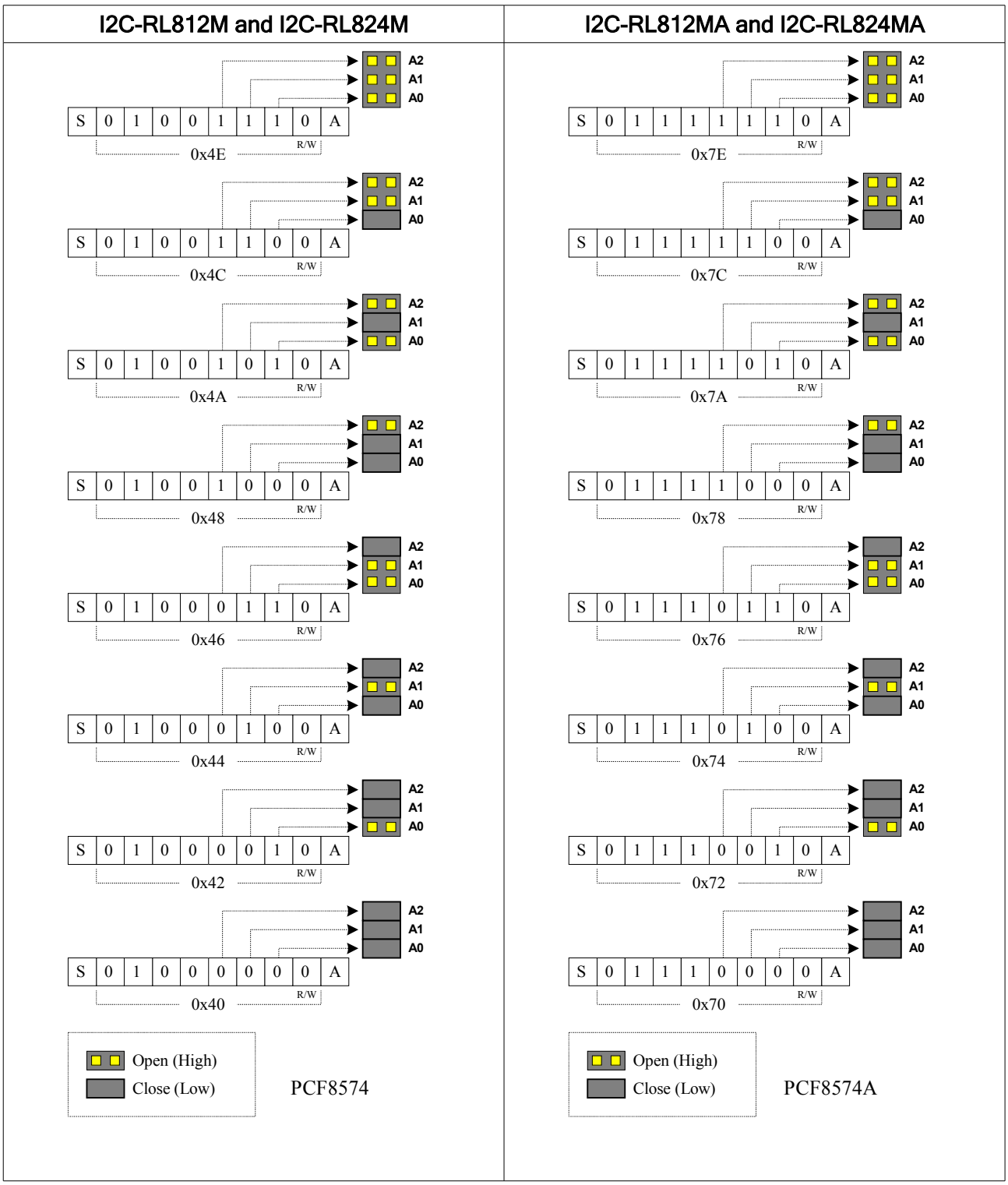

Table 1: Addressing

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.

Relay Input Voltage

Relays need input voltage 12V and 24V depending on board models. 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.

Specifications

Parameters	Value		Unit
Maximum I2C bus frequency	100		kHz
Logic power supply voltage	2.5 - 5.5		V
Relay power supply voltage	12, 24		V
Output channels	8		Relays
Maximum boards on bus	8 (16)		Boards
Relay contact rating	120Vac/24Vdc	10	A
	250Vac	6	

Table 2: Electrical Rating

	I2C-RL812M	I2C-RL812MA	I2C-RL824M	I2C-RL824MA
Max bus freq	100KHz	100KHz	100KHz	100KHz
Logic voltage	2.5V - 5.5V	2.5V - 5.5V	2.5V - 5.5V	2.5V - 5.5V
Relay voltage	12V	12V	24V	24V
I2C Chip	PCF8574	PCF8574A	PCF8574	PCF8574A

Table 3: Board Comparison

Board dimensions

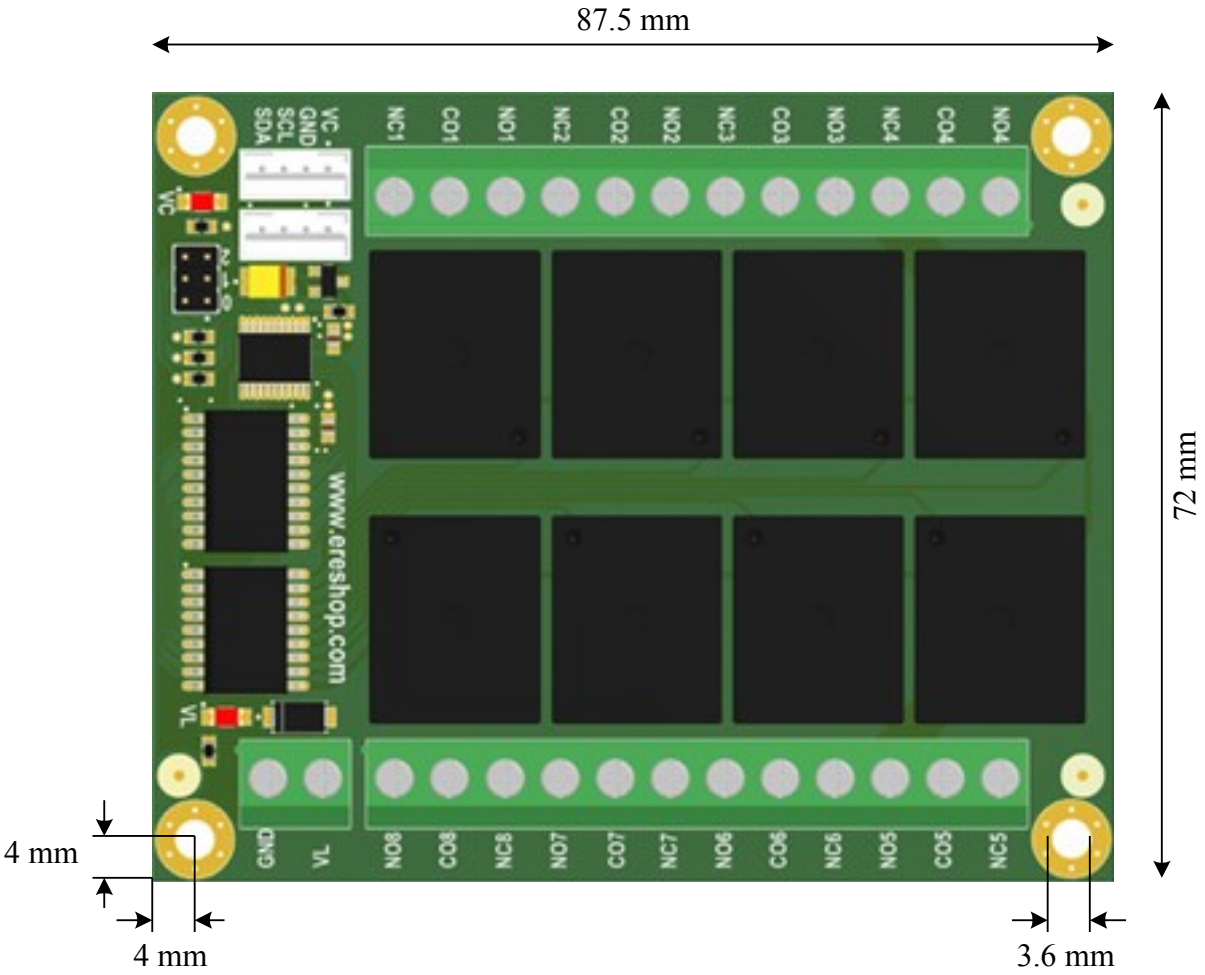

Figure 6: Board Dimensions