

8-RELAY EXPANSION CARD FOR RASPBERRY PI

www.sequentmicrosystems.com

USER'S GUIDE VERSION 3.1

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GENERAL DESCRIPTION



The 8-RELAY card is an 8 level stackable expansion card for Raspberry Pi B+, 2, 3 and Zero. It offers a compact and inexpensive solution for adding up to 64 relays to a Raspberry Pi project. Two of the Raspberry Pi's GPIO pins are used for I2C communication, leaving 24 GPIO pins available for the user. Status LEDs show when relays are on or off.

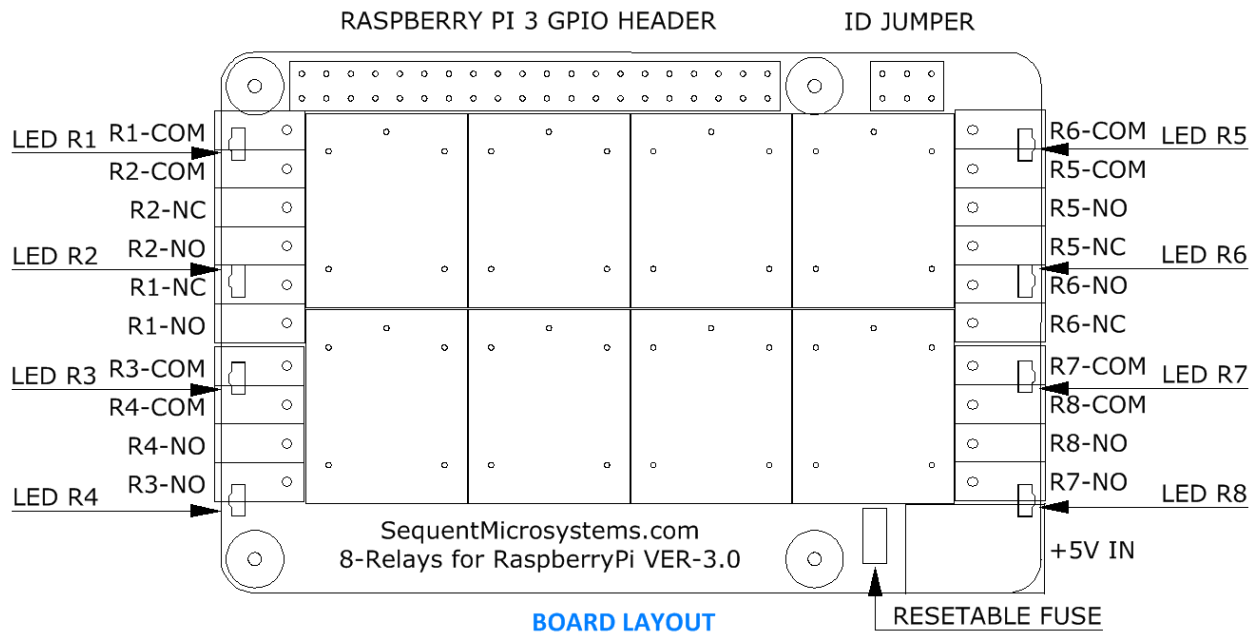
Version 3 of this card brings two improvements:

1. Screw-type connectors have been replaced with pluggable type. This permits easy access to all relay contacts when multiple cards are installed in a stack.

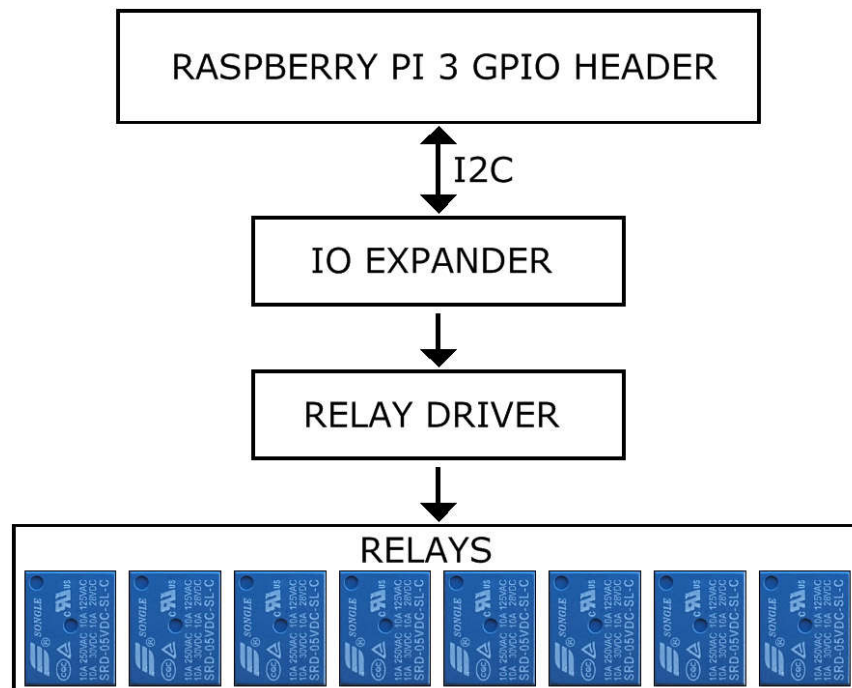
2. Traces from the relay contacts have been designed for 125V clearance and 4A or 8A current carrying capability.

In order to make room for the traces and still keep the same form factor, the bottom four relays (3, 4, 7, and 8) have only two contacts (Normal Open) brought to the terminal blocks. The top four relays (1, 2, 5, and 6) have both Normal Open and Normal Close contacts. Bottom relays 3, 4, 7, and 8 can carry 4A on contacts, while top relays 1, 2, 5 and 6 can carry 8A.

BOARD LAYOUT











BLOCK DIAGRAM

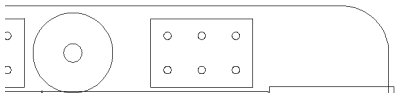


CONFIGURATION JUMPERS

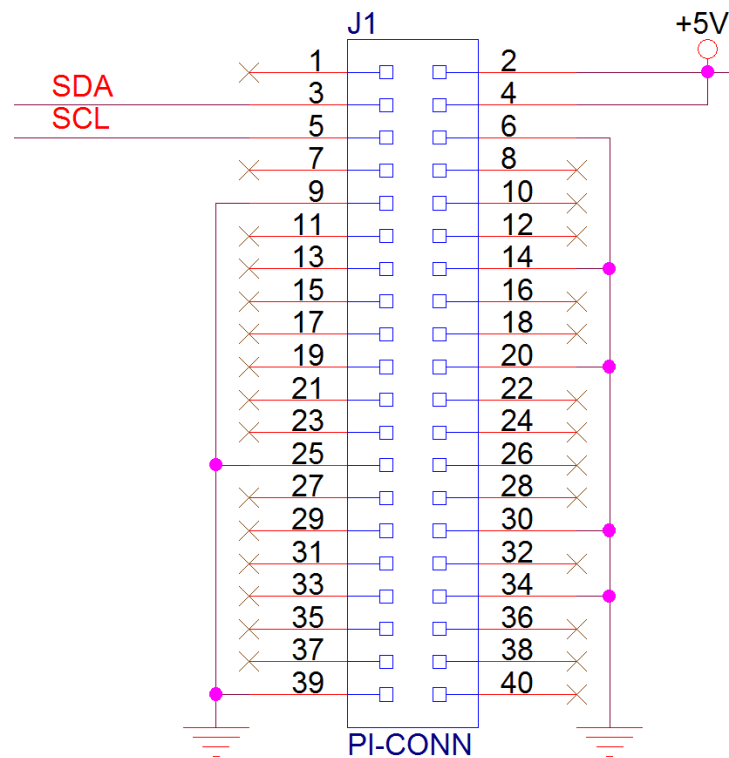
Three jumpers permit addressing multiple MEGA-IO cards on the I2C bus. No jumper needs to be installed if only one card is present. If two or more cards are stacked up, the card is addressed as shown in the following table:

ID JUMPER								
STACK LEVEL	0	1	2	3	4	5	6	7
I2C ADDR.	0x3F	0x3E	0x3D	0x3C	0x3B	0x3A	0x39	0x38

ID JUMPER



RASPBERRY PI CONNECTOR



POWER REQUIREMENTS

The 8-RELAY card requires +5V power, supplied either from the Raspberry Pi expansion bus, or from its own 2.1mm power jack.

8-RELAY Card current consumption: 10 mA @ +5V (all relays OFF)

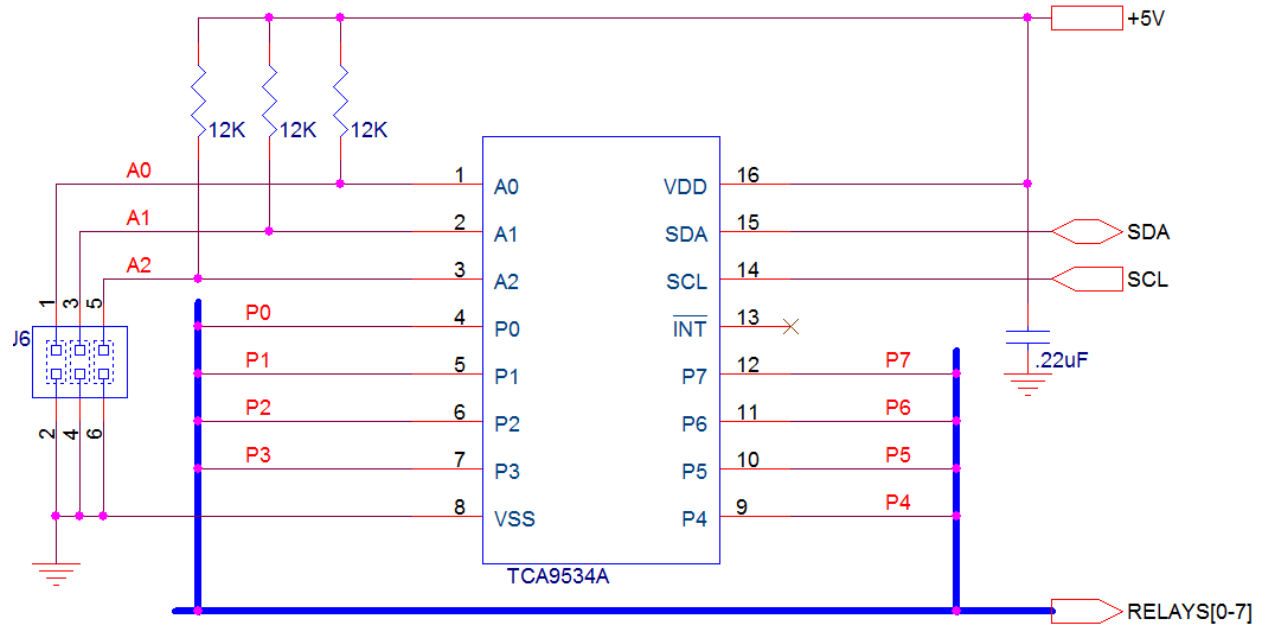
Relays power consumption: 72 mA each

586 mA @ +5V (all relays ON)

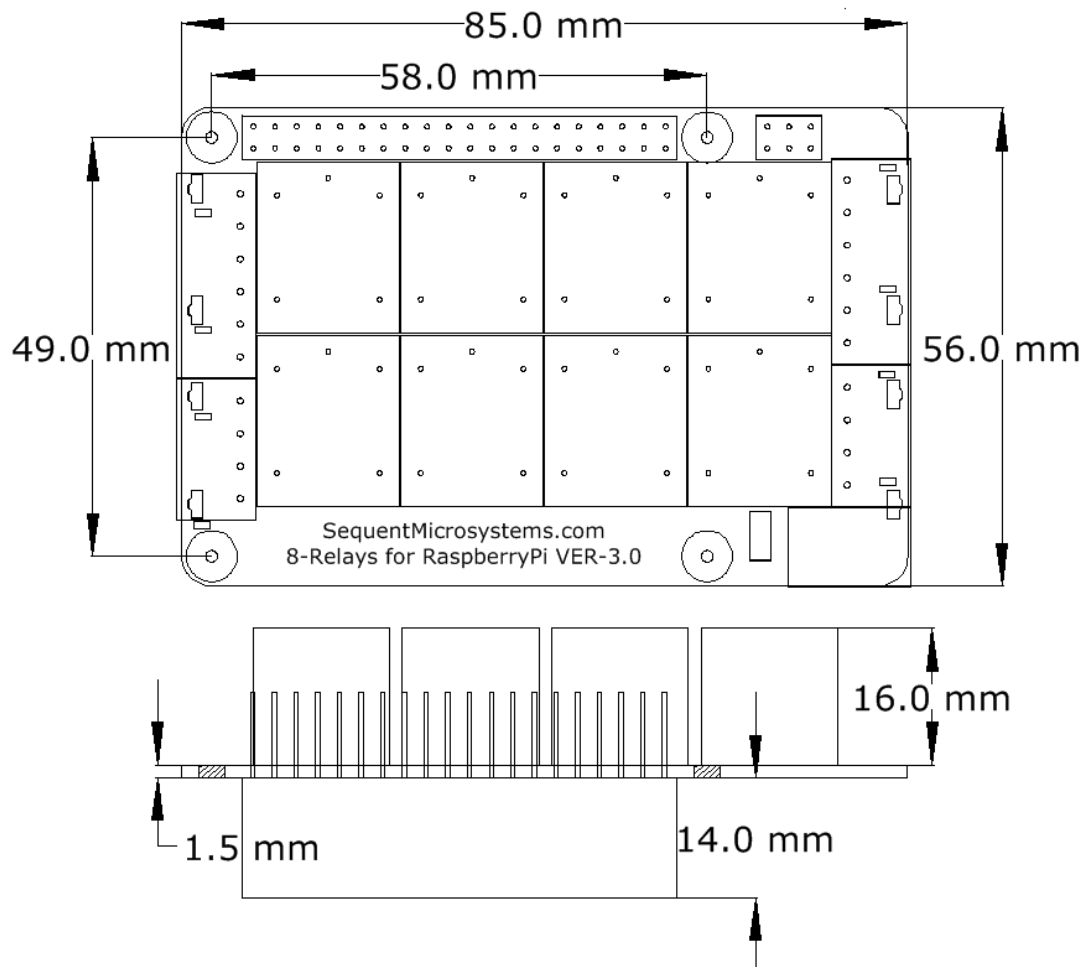
The jack which powers the 8-RELAY card can supply 3A. We recommend using this jack and a 5V regulated power supply rated 3A or higher.

The 8-RELAY card can be stacked up to eight levels, for a total of 64 relays. A multi-stack configuration can be powered from any of the cards. The total power requirement depends on the number of relays that you turn on at the same time. Make sure that you use a power supply able to power all your relays.

I/O EXPANDER



MECHANICAL SPECIFICATIONS



SOFTWARE SETUP

The 8-Relay board occupies the I2C addresses from 0x38 to 0x3F.

1. Have your Raspberry Pi ready with the [latest OS](#).

2. Enable I2C communication:

```
~$ sudo raspi-config
```

1. Change User Password	Change password for default user
2. Network Options	Configure network settings
3. Boot Options	Configure options for start-up
4. Localisation Options	Set up language and regional settings to match...
5. Interfacing Options	Configure connections to peripherals
6. Overclock	Configure overclocking for your Pi
7. Advanced Options	Configure advanced settings
8. Update	Update this tool to the latest version
9. About raspi-config	Information about this configuration

P1	Camera	Enable/Disable connection to the Raspberry Pi Camera
P2	SSH	Enable/Disable remote command line access to your Pi
P3	VNC	Enable/Disable graphical remote access to your Pi using...
P4	SPI	Enable/Disable automatic loading of SPI kernel module
P5	I2C	Enable/Disable automatic loading of I2C kernel module
P6	Serial	Enable/Disable shell and kernel messages to the serial port
P7	1-Wire	Enable/Disable one-wire interface
P8	Remote GPIO	Enable/Disable remote access to GPIO pins

3. Install the 8relay software from github.com:

```
~$ git clone https://github.com/SequentMicrosystems/8relay-rpi.git
```

4.

```
~$ cd /home/pi/8relay-rpi
```

5.

```
~/relay8-rpi$ sudo make install
```

6.

```
~/relay8-rpi$ 8relay
```

The program will respond with a list of available commands.

Type "**8relay -h**" for online help.

After installing the software, you can update it to the latest version with the commands:

1.

```
~$ cd /home/pi/8relay-rpi
```

2.

```
~/relay8-rpi$ git pull
```

3.

```
~/relay8-rpi$ sudo make install
```