Raspberry Pi Expansion Module
User Manual

52PI-RPI-Infinity
Maximum Power at Minimum Size

Raspberry Pi Infinity cascade IO expand Module User Manual
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Attention:

Due to technical requirements components, please do not hand directly connected Touch. Core board and development system contains static-sensitive devices. Quiet Electrical charge easily accumulate in the human body and the device can not detect possible Damage to equipment, it is recommended to take anti-static measures, it is recommended not to hand. Touch, stored in anti-static effect devices.

RaspberryPiExpand Module Serial
Infinity cascade IO expand module

This module is designed specifically for the Raspberry Pi IO expansion modules. The module expand 32 IO, Multiple modules can cascade, infinity cascade, infinity GPIO.

I2C GPIO expand module

This module is designed specifically for the Raspberry Pi IO expansion modules. The Module use I2C bus to connect to Raspberry Pi. The module expand 8 Bidirectional GPIO and wit isolation protection function which can effectively excessive external voltage. There are 8 I2C address, you can choose one of them through setup the jumper. Multiple modules can cascade and maximum cascade 8 modules!

Prototype development module

The Prototype development module is designed specifically for the Raspberry Pi. The module suitable enthusiasts and user can weld peripheral to the module; The module expand some amphenol connector and some SMT, so the user can finish prototype test easily.

Berryclip expand module

The BerryClip module is designed specifically for learning how to use the GPIO of Raspberry Pi. There are 6 multiple color LED, 1 button and 1 Buzzer on the module.

Berryclip(DIY) expand module

The module is not the end product, you need weld them by yourself. The function of the module is the same as BerryClip module.

UNO compatibility module

The module makes Raspberry Pi compatible with Arduino Uno and many Arduino Shields. The module’s GPIO is the same as Arduino Uno and you can choose the voltage of GPIO between 5V or 3V through setup jumper.

T Electric level convert module

The module expand the GPIO of Raspberry Pi to breadboard. It convert 3.3V electric to 5V electric level, then the Raspberry Pi can connect many 5V electric level peripheral.

IO extraction module

The module expand all of GPIO of Raspberry Pi to breadboard.

RTC expand module

The RTC module is specifically designed for Raspberry Pi. There is a 0.2uF Super Capacitor on the board to keep the real time for a long time after the Raspberry Pi
has power off.

**AD/DA expand module:**

The AD/DA module is specifically designed for Raspberry Pi. There is 8bit high resolution DAC and ADC on one chip.

**I2C electric level conversion expand module:**

The I2C electric level conversion module is specifically designed for Raspberry Pi. The module convert the 3.3V of I2C electric level to 5V level or convert 5V to 3.3V.

**I2C electric level conversion expand module**

The Serial Port module is specifically designed for Raspberry Pi. The module use Maxim MAX232 chip and DB9 port. So the user don’t need to connect Dupont Line and that avoid wrong wiring. User can use this mod
Product Specification

Product Overview

This module is designed specifically for the Raspberry Pi IO expansion modules, which can effectively solve the Raspberry send IO port insufficient. Module uses four 74HC595 chips to expand 32 IO ports. As shown above, the top of the module will expand the IO of Raspberry Pi again that can be cascaded for more IO expansion modules can theoretically unlimited expansion.

Product Features:

- Expanded 32 GPIO
- Infinity connection for the same module
- Use wiringPi API, sample code

Port:

- Raspberry Pi 2X13 port
- Raspberry Pi 2X13 cascade port
- Q0-Q31 expanded IO port
Product Parameters

- Working voltage: 2.4V-5V
- IO voltage: 3.3V
- Expanded 32 unidirectional IO
- Connection through SPI
- 100 MHz (typical) shift out frequency
- 8-bit serial input
- 8-bit serial or parallel output
- Specified from -40C to +85C and from -40C to +125C

Typical Application

- Drive the lattice screen
- Driver numeric display
- Drive matrix LED

Method Of Use

Insert the module that the silk screen says “IN”. Pay attention don’t make the direction reversed! The correct direction of insert module is above the Raspberry Pi’s PCB; The 8*4header in the module are Q0-Q31 expanded GPIO, they can connect to the peripheral through the Dupont Line. The header which near silk screen write ”EXT” expand GPIO of Raspberry Pi, user can cascade the other module or the same module.

More information

The 74HC595; 74HCT595 are high-speed Si-gate CMOS devices and are pin compatible with Low-power Schottky TTL (LSTTL). They are specified in compliance with JEDEC standard No. 7A.

The 74HC595; 74HCT595 are 8-stage serial shift registers with a storage register and 3-state outputs. The registers have separate clocks.

Data is shifted on the positive-going transitions of the shift register clock input (SHCP).

The data in each register is transferred to the storage register on a positive-going transition of the storage register clock input (STCP). If both clocks are connected together, the shift register will always be one clock pulse ahead of the storage register.
The shift register has a serial input (DS) and a serial standard output (Q7S) for cascading. It is also provided with asynchronous reset (active LOW) for all 8 shift register stages. The storage register has 8 parallel 3-state bus driver outputs. Data in the storage register appears at the output whenever the output enable input (OE) is LOW.

**Function table:**

<table>
<thead>
<tr>
<th>Control</th>
<th>Input</th>
<th>Output</th>
<th>Function</th>
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</thead>
<tbody>
<tr>
<td>SHCP</td>
<td>STCP</td>
<td>OE</td>
<td>MR</td>
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<tr>
<td>X</td>
<td>X</td>
<td>L</td>
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<td>X</td>
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</tbody>
</table>

H = HIGH voltage state;
L = LOW voltage state;
↑ = LOW-to-HIGH transition;
X = don’t care;
NC = no change;
Z = high-impedance OFF-state.
Schematic diagram

More information please check
Example and test code:

```c
#include <wiringPi.h>
#include <stdio.h>

int SER   = 12;
int RCLK  = 10;
int SRCLK = 14;
unsigned char LED[8]={0x01, 0x02, 0x04, 0x08, 0x10, 0x20, 0x40, 0x80};

void SIPO (unsigned char byte);
void pulse (int pin);

void init () {
    pinMode (SER, OUTPUT);
    pinMode (RCLK, OUTPUT);
    pinMode (SRCLK, OUTPUT);
    digitalWrite (SER, 0);
    digitalWrite (SRCLK, 0);
    digitalWrite (RCLK, 0);
}

void delayMS (int x) {
    usleep (x * 1000);
}

int main (void) {
    int i;
    if (-1 == wiringPiSetup ()) {
        printf ("Setup wiringPi failed!");
        return 1;
    }
    init ();
    while (1) {
        for (i = 0; i < 8; i++)
        {
            SIPO (LED[i]);
            pulse (RCLK);
            delayMS (50);
            printf (" i = %d", i);
        }
        printf ("\n");
        delayMS (500); // 500 ms
        for (i = 7; i >= 0; i--)
        {
            SIPO (LED[i]);
        }
    }
}
```
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```
pulse (RCLK);
delayMS (50);
printf (" i = %d", i);
}
delayMS (500); // 500 ms
}
usleep (1000);
digitalWrite (RCLK, 1);
}
void SIPO (unsigned char byte)
{
    int i;
    for (i=0;i<8;i++)
    {
        digitalWrite (SER, ((byte & (0x80 >> i)) > 0));
        pulse (SRCLK);
    }
}
void pulse (int pin)
{
    digitalWrite (pin, 1);
    digitalWrite (pin, 0);
}