

How to use DIDO shield on Raspberry Pi 4B

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1. Enabled SPI interface

sudo raspi-config

```
1 Change User Password Change password for the current 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 your location
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 tool
```

```
P1 Camera      Enable/Disable connection to the Raspberry Pi Camera
P2 SSH         Enable/Disable remote command line access to your Pi using SSH
P3 VNC         Enable/Disable graphical remote access to your Pi using RealVNC
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 on the serial connection
P7 1-Wire      Enable/Disable one-wire interface
P8 Remote GPIO Enable/Disable remote access to GPIO pins
```

2. Install the piface software support package (this method also fit to hardware prior to PI4B)

Since Debian Stretch and later versions of the software source do not include the relevant software files, you cannot use the apt-get tool to install them, so we need to install them manually.

Method 1:

Download the deb package online on raspberry pi via wget command

```
wget https://github.com/piface/pifacecommon/releases/download/v4.2.1/python3-pifacecommon_4.2.1-1_all.deb
```

```
wget https://github.com/piface/pifacedigitalio/releases/download/v3.1.0/python3-pifacedigitalio_3.1.0-1_all.deb
```

Method 2:

First download the deb package offline on the pc, then copy it to raspberry pi

Installation:

```
sudo dpkg -i python3-pifacecommon_4.2.1-1_all.deb
```

```
sudo dpkg -i python3-pifacedigitalio_3.1.0-1_all.deb
```

3. Set the SPI communication port clock frequency

In the new firmware, the default spi clock frequency is too high to be adjusted. The file path of different firmware version settings may be slightly different. Take raspberry pi 4B latest version of Raspbian Buster as an example

```
sudo vim /usr/lib/python3/dist-packages/pifacecommon/spi.py
```

Search:

```
# create the spi transfer struct
```

```
transfer = spi_ioc_transfer(  
    tx_buf=ctypes.addressof(wbuffer),  
    rx_buf=ctypes.addressof(rbuffer),  
    len=ctypes.sizeof(wbuffer)  
)
```

Add the following comment 添加一行默认频率设定

```
# create the spi transfer struct
```

```
transfer = spi_ioc_transfer(  
    tx_buf=ctypes.addressof(wbuffer),  
    rx_buf=ctypes.addressof(rbuffer),  
    len=ctypes.sizeof(wbuffer),  
    speed_hz=ctypes.c_uint32(100000) #set default frequency  
)
```

Now, the DIDO shield works well.

About PCB layout:

Since the Pi4 B Ethernet port is moved to the upper side of the PCB and there is a conflict between the DIDO module, it cannot be closely connected with the pin without processing. The length of the right side of the DIDO module PCB should be reduced by about 1.5 mm, and the position of the copper column mounting hole is unchanged.

Interface layout:

PI 3 and previous versions



PI4 B



Reference:

Piface GitHub:

<https://github.com/piface>

<https://github.com/piface/pifacecommon/releases>

<https://github.com/piface/pifacedigitalio/releases>

How to set SPI frequency:

<https://www.raspberrypi.org/forums/viewtopic.php?t=170606>

<https://raspberrypi.stackexchange.com/questions/67028/piface-digital-2-and-raspberry-pi-3?rq=1>

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