

Runtime Environment:

BIOS: Version: 1.08.98 Release Date: 05/31/2022

OS: Linux asus-PE400D 5.4.0-110-generic #124~18.04.1-Ubuntu

OS: Linux asus-PE400D 5.13.0-44-generic #49~20.04.1-Ubuntu

OS: Linux asus-PE400D 5.15.0-41-generic #44-Ubuntu 22.04 LTS

Step 1: Installing Ubuntu OS 18.04.6, 20.04.4/22.04

Make sure the Linux Kernel version is 5.4.0 (Ubuntu 18.04) or 5.13.0 (Ubuntu 20.04).

```
// for Ubuntu 18.04 with Linux kernel 5.4
asus@asus-PE400D:~$ uname -a
Linux asus-PE400D 5.4.0-110-generic #124~18.04.1-Ubuntu SMP Fri Apr 22
12:01:21 UTC 2022 x86_64 x86_64 x86_64 GNU/Linux
```

```
// for Ubuntu 20.04 with Linux kernel 5.13
asus@asus-PE400D:~$ uname -a
Linux asus-PE400D 5.13.0-44-generic #49~20.04.1-Ubuntu SMP Wed May 18
18:44:28 UTC 2022 x86_64 x86_64 x86_64 GNU/Linux
```

```
for Ubuntu 22.04 with Linux kernel 5.15
asus@asus-PE400D:~$ uname -a
Linux asus-PE400D 5.15.0-41-generic #44-Ubuntu SMP Wed Jun 22 14:20:53 UTC
2022 x86_64 x86_64 x86_64 GNU/Linux
```

Step 2: Input the following command to install driver

```
// for Ubuntu 18.04 with Linux kernel 5.4
$ sudo apt-get update
$ sudo apt-get install build-essential i2c-tools
$ sudo modprobe i2c-i801
```

Step 3: Make sure the driver is loaded

```
asus@asus-PE400D:~$ lsmod | grep i2c
i2c_i801                36864  0
i2c_smbus               20480  1 i2c_i801
i2c_algo_bit            16384  2 i2c_i801,i2c_smbus
```

Step 4: Check the target device DIO is existing

```
asus@asus-PE400D:~$ sudo i2cdetect -l
[sudo] password for asus:
i2c-0  smbus          SMBus I801 adapter at efa0          SMBus adapter
i2c-1  i2c             Synopsys DesignWare I2C adapter        I2C adapter
```

i2c-2	i2c	Synopsys Designware I2C adapter	I2C adapter
i2c-3	i2c	i915 gmbus dpb	I2C adapter
i2c-4	i2c	i915 gmbus dpc	I2C adapter
i2c-5	i2c	i915 gmbus misc	I2C adapter
i2c-6	i2c	i915 gmbus dpd	I2C adapter
i2c-7	i2c	AUX B/DDI B/PHY B	I2C adapter
i2c-8	i2c	AUX D/DDI D/PHY D	I2C adapter

```
asus@asus-PE400D:~$ sudo i2cdetect -y -r 0
```

```

    0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
00:                -- -- -- -- -- -- -- --
10: -- -- -- -- -- -- -- -- -- -- -- -- --
20: 20 -- -- -- -- -- -- -- -- -- -- -- -- --
30: 30 -- -- -- -- 35 UU UU -- -- -- -- -- --
40: -- -- -- -- 44 -- -- -- -- -- -- -- -- --
50: UU -- -- -- -- -- -- -- -- -- -- -- -- --
60: -- -- 62 -- -- -- -- -- -- -- -- -- -- --
70: -- -- -- -- -- -- -- -- --
```

The DIO sample code is based on Linux native i2c-dev interface

Dev-interface: <https://www.kernel.org/doc/Documentation/i2c/dev-interface.rst>

Step 6: Get into the C sample code folder and compile the DIO sample code

```

asus@asus-PE400D:~/code/PE400D/DIO$ make clean
make -C src/ clean
make[1]: Entering directory '/home/asus/code/PE400D/DIO/src'
rm -f ./*.o ./DO0 ./DO1 ./DO2 ./DO3 ./DIO ./DI1 ./DI2 ./DI3
rm -f ../bin/DO0 ../bin/DO1 ../bin/DO2 ../bin/DO3 ../bin/DIO ../bin/DI1 ../bin/DI2 ../bin/DI3
make[1]: Leaving directory '/home/asus/code/PE400D/DIO/src'
asus@asus-PE400D:~/code/PE400D/DIO$ make
make -C src/ clean
make[1]: Entering directory '/home/asus/code/PE400D/DIO/src'
rm -f ./*.o ./DO0 ./DO1 ./DO2 ./DO3 ./DIO ./DI1 ./DI2 ./DI3
rm -f ../bin/DO0 ../bin/DO1 ../bin/DO2 ../bin/DO3 ../bin/DIO ../bin/DI1 ../bin/DI2 ../bin/DI3
make[1]: Leaving directory '/home/asus/code/PE400D/DIO/src'
make -C src/
```

```

make[1]: Entering directory '/home/asus/code/PE400D/DIO/src'

cc -Wstrict-prototypes -Wshadow -Wpointer-arith -Wcast-qual -Wcast-align -Wwrite-strings -Wnested-externs -Winline -W -Wundef -Wmissing-prototypes -linclude -c DO0.c -o DO0.o

cc -Wstrict-prototypes -Wshadow -Wpointer-arith -Wcast-qual -Wcast-align -Wwrite-strings -Wnested-externs -Winline -W -Wundef -Wmissing-prototypes -linclude -c common.c -o common.o

cc -o DO0 DO0.o common.o

cc -Wstrict-prototypes -Wshadow -Wpointer-arith -Wcast-qual -Wcast-align -Wwrite-strings -Wnested-externs -Winline -W -Wundef -Wmissing-prototypes -linclude -c DO1.c -o DO1.o

cc -o DO1 DO1.o common.o

cc -Wstrict-prototypes -Wshadow -Wpointer-arith -Wcast-qual -Wcast-align -Wwrite-strings -Wnested-externs -Winline -W -Wundef -Wmissing-prototypes -linclude -c DO2.c -o DO2.o

cc -o DO2 DO2.o common.o

cc -Wstrict-prototypes -Wshadow -Wpointer-arith -Wcast-qual -Wcast-align -Wwrite-strings -Wnested-externs -Winline -W -Wundef -Wmissing-prototypes -linclude -c DO3.c -o DO3.o

cc -o DO3 DO3.o common.o

cc -Wstrict-prototypes -Wshadow -Wpointer-arith -Wcast-qual -Wcast-align -Wwrite-strings -Wnested-externs -Winline -W -Wundef -Wmissing-prototypes -linclude -c DIO.c -o DIO.o

cc -o DIO DIO.o common.o

cc -Wstrict-prototypes -Wshadow -Wpointer-arith -Wcast-qual -Wcast-align -Wwrite-strings -Wnested-externs -Winline -W -Wundef -Wmissing-prototypes -linclude -c DI1.c -o DI1.o

cc -o DI1 DI1.o common.o

cc -Wstrict-prototypes -Wshadow -Wpointer-arith -Wcast-qual -Wcast-align -Wwrite-strings -Wnested-externs -Winline -W -Wundef -Wmissing-prototypes -linclude -c DI2.c -o DI2.o

cc -o DI2 DI2.o common.o

cc -Wstrict-prototypes -Wshadow -Wpointer-arith -Wcast-qual -Wcast-align -Wwrite-strings -Wnested-externs -Winline -W -Wundef -Wmissing-prototypes -linclude -c DI3.c -o DI3.o

cc -o DI3 DI3.o common.o

make[1]: Leaving directory '/home/asus/code/PE400D/DIO/src'

asus@asus-PE400D:~/code/PE400D/DIO$ ls bin/

DIO  DI1  DI2  DI3  DO0  DO1  DO2  DO3

```

Step 6: Run the sample code

```

// Get DIO value

asus@asus-PE400D:~/code/PE400D/DIO/bin$ sudo ./DIO

0

// Set DO1 to High

asus@asus-PE400D:~/code/PE400D/DIO/bin$ sudo ./DO1 1

// set DO1 to Low

```

```
asus@asus-PE400D:~/code/PE400D/DIO/bin$ sudo ./DO1 0
```