FXL6408 driver – User Guide

Revision History

Revision	Date	Author	Changes
1_0	28th September 2017	MM	First release
1_1	27th November 2017	MM	Validation test with Debian 9.2

1. Introduction

This guide show how install and use Linux and Windows 10 drivers for FXL6408 GPIO Expander.

FXL6408 GPIO Expander is present on the following SECO board:

- SBC-A44-pITX

2. Bios setting

FXL6408 GPIO Expander ACPI device must be enable in BIOS settings following thees steps:

1. Press **Esc** to enter in BIOS setup
2. Press **SCU** menu
3. Set Advanced\LPSS&SCC Configuration\LPSS&SCC Devices Mode as **ACPI Mode**
4. Set Advanced\LPSS&SCC Configuration\LPSS DMA#2 Support as **Enabled**
5. Set Advanced\LPSS&SCC Configuration\LPSS DMA#2 Support\Gpio Expander I2C Support as **Enabled**
6. Press **F10** to save end exit

3. Linux installation

FXL6408 GPIO Expander Linux driver works with kernel 4.5 or later and has been tested on:

- ***Ubuntu17.04 64bit*** with ***kernel 4.10.0-19***
- ***Debian 9.2.0*** *with* ***kernel 4.9.0-4***.

If you use linux kernel older that 4.5, you can use FXL6408 GPIO expander communicating through I2C bus with i2c-tools package and refering to FXL6408 datasheet (*FXL6408-1010410.pdf*).

You can compile, install and use following these steps:

1. Open a terminal with ctrl+T and enter on driver folder
2. Install **build-essential** and **linux-headers** packages:

```
sudo apt-get install build-essential
sudo apt-get install linux-headers-$(uname -r)
```

3. Type **make** into the teminal to compile the driver
4. Type **sudo insmod gpio-fxl6408.ko** to load the driver
5. On folder **/sys/class/gpio** will be added a new gpio device as **gpiochipXXX** where **XXX** is the number assigned to gpio device from OS. The numbers from **XXX** to **XXX + 7** are the 8 gpio of FXL6408 GPIO Expander
6. Type **echo YYY | sudo tee /sys/class/gpio/export** to export the specific single GPIO **YYY** (**YYY** from **XXX** to **XXX+7**).
7. On folder **/sys/class/gpio** will be added a new gpio as **gpio YYY**.
8. Read **/sys/class/gpio/gpioYYY/direction** value to know the current GPIO **YYY** direction
9. Read **/sys/class/gpio/gpioYYY/value** value to know the current GPIO **YYY** status
10. Use the command: **echo in | sudo tee /sys/class/gpio/gpioYYY/direction** to set GPIO **YYY** direction as input
11. Use the command: **echo out | sudo tee /sys/class/gpio/gpioYYY/direction** to set GPIO **YYY** direction as output
12. Use the command: **echo 1 | sudo tee /sys/class/gpio/gpioYYY/value** to set GPIO **YYY** status as high
13. Use the command: **echo 0 | sudo tee /sys/class/gpio/gpioYYY/value** to set GPIO **YYY** status as low
14. Type **echo YYY | sudo tee /sys/class/gpio/unexport** to unexport the specific single GPIO **YYY**.
15. Type **sudo rmmod gpio-fxl6408** to unload the driver

4. Window 10 installation

FXL6408 GPIO Expander W10 driver can be installed and use following these steps:

1. Install the latest Serial_IO controller driver for your board, downloadable from SECO web site.
2. Verify the presence of **Unknow Device** with Device ID as **ACPI\15740601** in Device Manager
3. Press mouse right-buttot on **FXL6408_TestTool.inf** and select **install**
4. On Device Manger, will be added a **"FXL6408 Peripheral Driver**" device under Sample section.
5. Open a command shell with Administrator privilege.
6. From driver folder type the following command: **FXL6408_TestTool.exe**
7. Type the command **open** to open the device
8. Type the command **gpiogetdirection** to get the direction of the 8 GPIOs (1 for Input and 0 for Output)
9. Type the command **gpiosetdirection {xx}** to set the direction of the 8 GPIOs (1 for Input and 0 for Output) where **xx** is the bit mask to manage each single GPIOs
10. Type the command **gpiogetoutstatus** to get the output value of the 8 GPIOs
11. Type the command **gpiosetoutstatus {xx}** to set the output value of the 8 GPIOs where **xx** is the bit mask to manage each single GPIOs
12. Type the command **gpiogetinputstatus** to get the input value of the 8 GPIOs
13. Type the command **close** to close the device
14. Type the command **help** to show tool help

You can use **FXL6408_TestTool** source code present on **\W10_Driver\SourceCode\FXL6408_TestTool** folder as sample code to integrate it on your software.

FXL6408_TestTool application requires Visual Studio redistributable libraries.