Fitlet3 GPIO LED programming instruction

Important: These instructions are only applicable to fitlet3 units with the updated FPGA revision. For confirmation and further details, please contact C-LAB technical support.
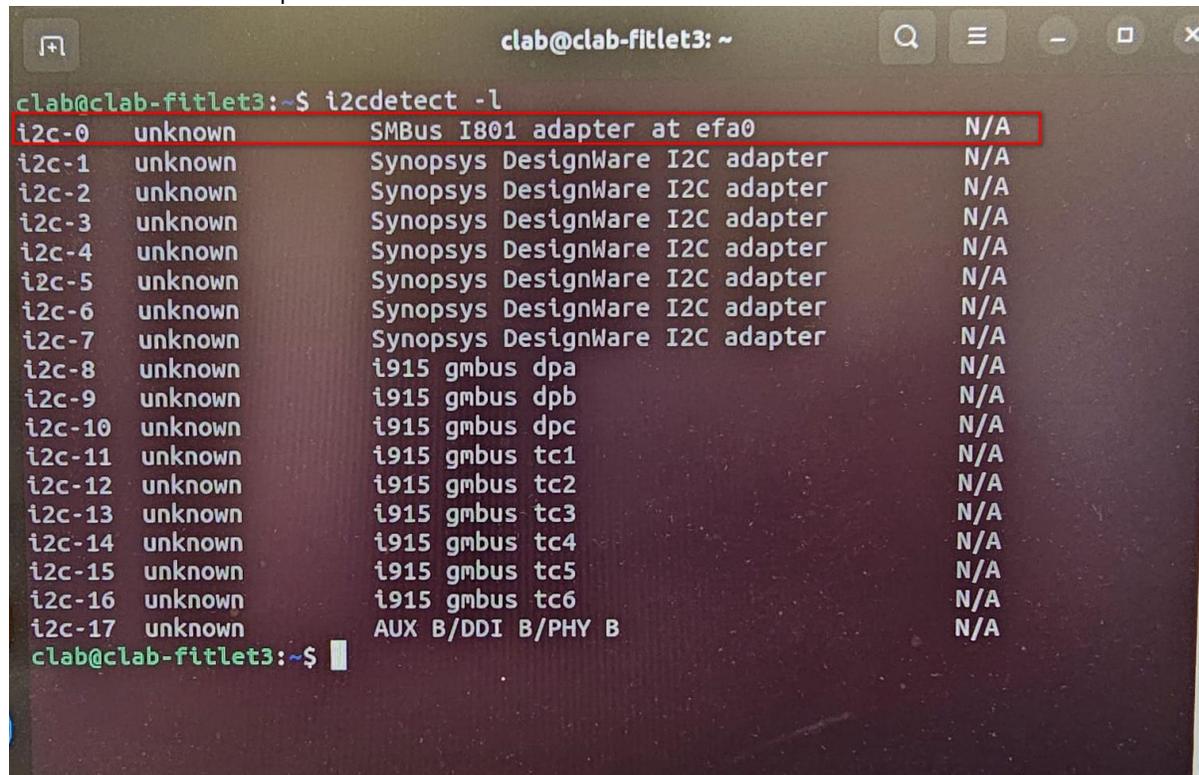
1. **Install required tools:**

```
apt install i2c-tools
apt install gpiod
```

2. **Detect the SMBus (I2C bus) number:**

```
i2cdetect -l
```

Find the SMBUS I801 adapter bus.

3. **Add the GPIO device:**
   Replace <bus number> with the correct SMBUS number from step 2.

```
echo pca9555 0x20 > /sys/bus/i2c/devices/i2c-<bus number>/new_device
```
   0x20 is the I2C address of the PCA9555; you can confirm it by running:
```
i2cdetect -y <bus number>
```

For example:
If your unit's bus number is 0 as shown in the picture above, the command will be:

```
echo pca9555 0x20 > /sys/bus/i2c/devices/i2c-0/new_device
```

4. **Verify GPIO chip detection:**

```
gpiodetect
```

You should see a new GPIO chip listed (16 lines), such as gpiochipN.

The chip number (gpiochip0, gpiochip1, etc.) may vary by system.

5. **GPIO LED Command table**
The LED behavior is controlled by a **3-bit code** sent through three specific GPIO lines on the expander. Each line represents one bit of the code:

Command Bit	GPIO Expander Line
Bit 0 (LSB)	GPIO 10
Bit 1	GPIO 11
Bit 2 (MSB)	GPIO 12

Bit order is from MSB to LSB:
GPIO 12 (bit 2), **GPIO 11** (bit 1), **GPIO 10** (bit 0)

These three lines are interpreted together as a single 3-bit value, which defines the LED behavior (e.g., turning the green or yellow LEDs ON or OFF).

To ensure the system correctly processes the command, all three GPIO lines must be set simultaneously using the gpioset tool.

6. **Send LED Commands via Terminal**

Use the gpioset tool to send LED control commands:

Action	Bit Code	Command Example
Turn ON Green LED	001	gpioset 0 12=0 11=0 10=1
Turn ON Yellow LED	010	gpioset 0 12=0 11=1 10=0
Turn OFF both LEDs	011	gpioset 0 12=0 11=1 10=1

Note:

Replace 0 in the command example (gpioset 0 …) with the correct **GPIO chip number** detected in step 4.
For example, if gpiodetect shows gpiochip2, use 2.…

Further information

https://edge.compulab.com/products/fitlet3/
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