

Introduction to ARM-GCC using Pygmy

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Contents

1	Software	1
2	Setup	1
3	Delay	1

Abstract—This document provides a simple introduction to ARM programming using Pygmy.

1 Software

All codes used in this document are available at the following link

<https://github.com/gadepall/vaman/tree/master/arm/codes/setup>

2 Setup

- 2.1. Connect the raspberry pi to pygmy through USB.
- 2.2. On the left of the USB port, an LED and a button can be seen. Another button is visible on the right of the USB port.
- 2.3. Press the right button and immediately press the left button. The green LED starts blinking. The pygmy is now in download mode.
- 2.4. Open termux on android and execute the following codes

```
cd ~
svn co https://github.com/
gadepall/vaman/trunk/arm/
codes/setup/blink
cd GCC_Project
make
scp output/bin/blink.bin
pi@192.168.0.114:
```

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Appropriately modify the above ip address before sending blink.bin to the pi.

- 2.5. Now log on to the RPi and execute the following

```
sudo python3 /home/pi/pygmy-dev
/pygmy-sdk/TinyFPGA-
Programmer-Application/
tinyfpga-programmer-gui.py
--port /dev/ttyACM0 --m4app
blink.bin --mode m4-fpga
```

- 2.6. Enter the appropriate USB device port above while executing. Press the button to the right after the above command is successfully executed. The LED will start blinking.

3 Delay

- 3.1. See the following lines of the code below

codes/setup/blink/src/main.c

```
PyHal_Set_GPIO(18,1); // blue
PyHal_Set_GPIO(21,1); //
green
PyHal_Set_GPIO(22,1); // red
HAL_DelayUsec(2000000);
PyHal_Set_GPIO(18,0);
PyHal_Set_GPIO(21,0);
PyHal_Set_GPIO(22,0);
```

We may conclude that the blink delay is 2000 000us = 2 s.

- 3.2. Replace the following line in 3.1

```
HAL_DelayUsec(2000000);
```

with

```
HAL_DelayUsec(1000000);
```

and execute. Can you see any difference in the blink period?

- 3.3. To obtain red colour, execute the following code.

Type	Pin	Destination
Input	IO_5	GND

TABLE 3.5.1: Pygmy control through external input.

```
codes/setup/red/src/main.c
```

Now obtain blue colour.

3.4. Now obtain green colour without blink.

Solution: Execute the following code.

```
codes/setup/onoff/src/main.c
```

3.5. Using Table 3.5.1 and Fig. 3.5.1, use an input pin to control the onboard LED.

Solution: Execute the following code. You should see the LED blinking pink. Disconnecting the wire from GND will result in the LED blinking white and green alternately.

```
codes/setup/gpio/src/main.c
```

PYGMY BB4

PINOUT

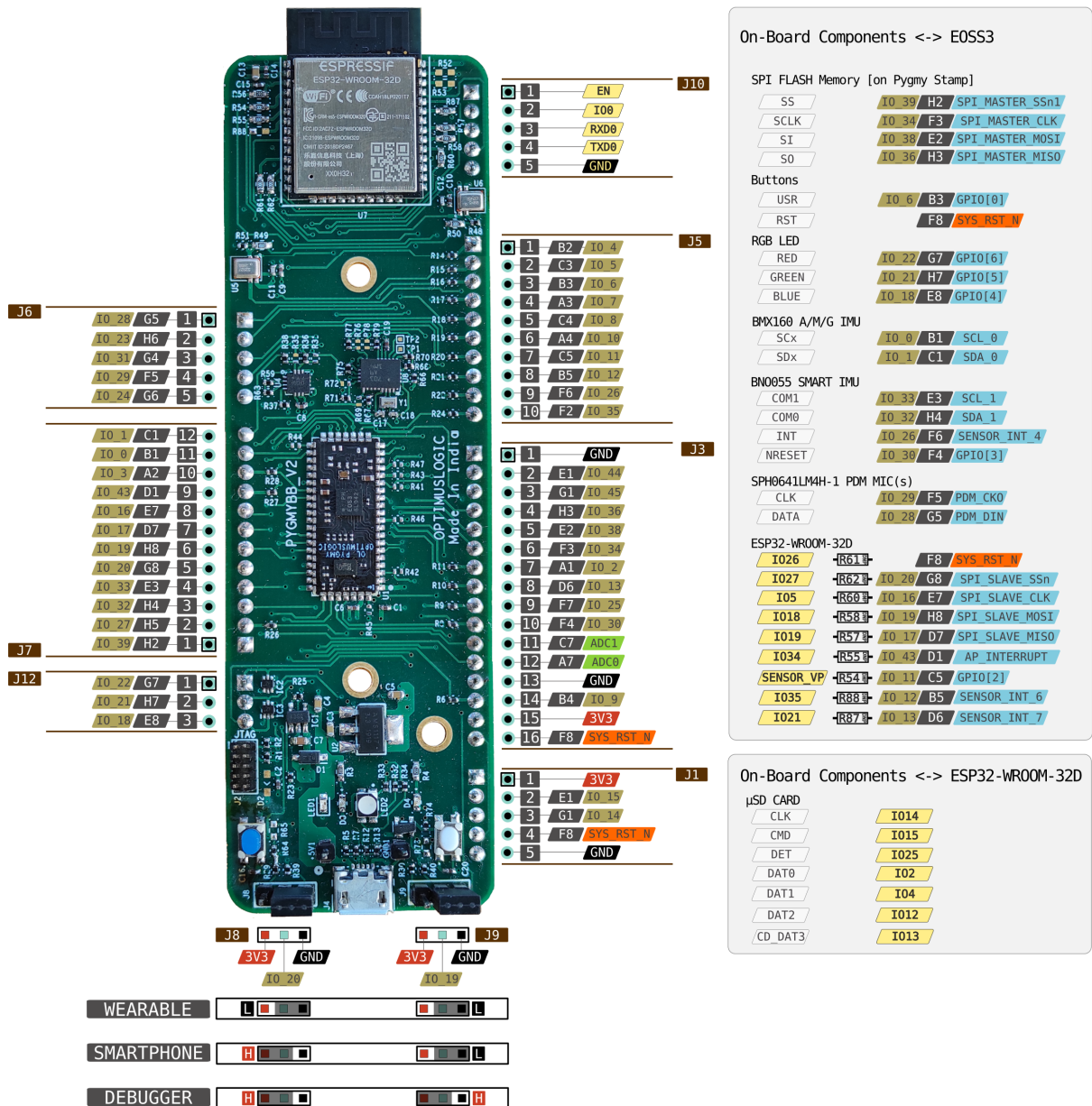


Fig. 3.5.1: Pin Diagram