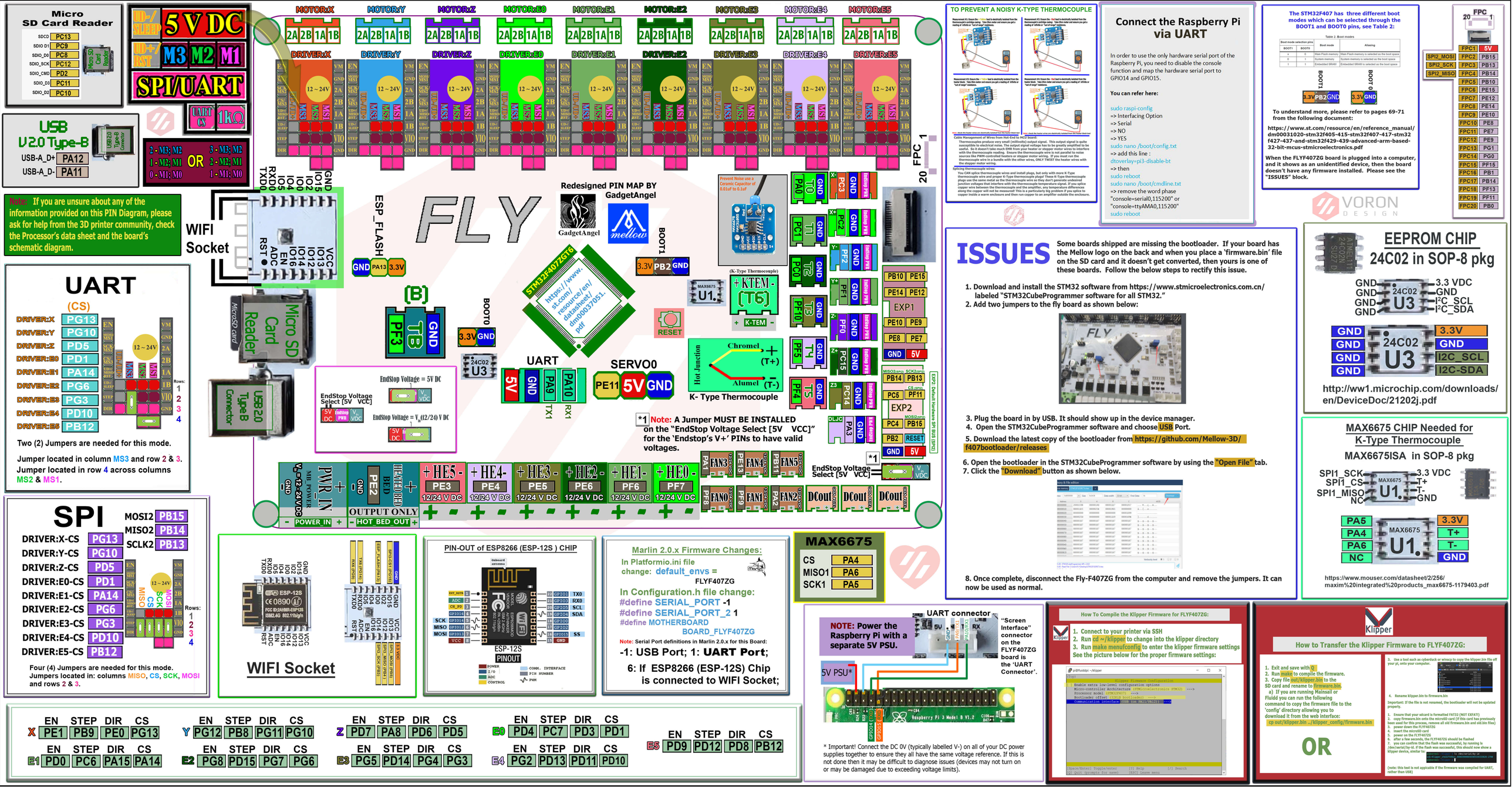
Micro SD Card Reader
SDCD PC13
SDIO D1 PC9
SDIO_D0 PC8
SDIO_SCK PC12
SDIO_CMD PD2
SDIO_D3 PC11
SDIO_D2 PC10
5V DC
M3 M2 M1
SPI/UART
UART CS 1kΩ
USB V2.0 Type-B
USB-A_D+ PA12
USB-A_D- PA11
2 - M3; M2
1 - M2; M1
0 - M1; M0
OR
3 - M3; M2
2 - M2; M1
1 - M1; M0
Note: If you are unsure about any of the information provided on this PIN Diagram, please ask for help from the 3D printer community, check the Processor's data sheet and the board's schematic diagram.
MOTOR:X
MOTOR:Y
MOTOR:Z
MOTOR:E0
MOTOR:E1
MOTOR:E2
MOTOR:E3
MOTOR:E4
MOTOR:E5
2A 2B 1A 1B
DRIVER:X
DRIVER:Y
DRIVER:Z
DRIVER:E0
DRIVER:E1
DRIVER:E2
DRIVER:E3
DRIVER:E4
DRIVER:E5
12 ~ 24V
FPC 1
20
WIFI Socket
ESP_FLASH
GND PA13 3.3V
FLY
Redesigned PIN MAP BY GadgetAngel
GadgetAngel
mellow
BOOT1
3.3V PB2 GND
STM32F407ZGT6
https://www.st.com/resource/en/datasheet/dm00037051.pdf
(B)
PF3 GND
BOOT0
3.3V GND
24C02 U3
RESET
UART
5V GND PA9 PA10
TX1 RX1
SERVO0
PE11 5V GND
Prevent Noise use a Ceramic Capacitor of 0.01uF to 0.1uF
(K-Type Thermocouple)
+ KTEM -
(T5)
+ K-TEM -
MAX6675 U1.
Hot Junction
Chromel (T+)
Alumel (T-)
K- Type Thermocouple
UART
(CS)
DRIVER:X PG13
DRIVER:Y PG10
DRIVER:Z PD5
DRIVER:E0 PD1
DRIVER:E1 PA14
DRIVER:E2 PG6
DRIVER:E3 PG3
DRIVER:E4 PD10
DRIVER:E5 PB12
Micro SD Card Reader
MicroSD card
USB 2.0 Type B Connector
Rows: 1 2 3 4
Two (2) Jumpers are needed for this mode.
Jumper located in column MS3 and row 2 & 3.
Jumper located in row 4 across columns MS2 & MS1.
EndStop Voltage = 5V DC
EndStop Voltage Select [5V VCC]
EndStop Voltage = V_in(12/24) V DC
*1 Note: A Jumper MUST BE INSTALLED on the "EndStop Voltage Select [5V VCC]" for the 'Endstop's V+' PINs to have valid voltages.
PWR_IN
V_in = 12-24 VDC
MB_POWER
GND
POWER IN
HEATED BED
PE2
OUTPUT ONLY
HOT BED OUT
+ HE5 - PE3 12/24 V DC
+ HE4- PE4 12/24 V DC
+ HE3 - PE5 12/24 V DC
+ HE2 - PE6 12/24 V DC
+ HE1- PF6 12/24 V DC
+ HE0 - PF7 12/24 V DC
FAN3 PA1
FAN4 PE13
FAN5 PB11
FAN0 PF8
FAN1 PF9
FAN2 PA2
DCout
EndStop Voltage Select [5V VCC]
*1
SPI
MOSI2 PB15
MISO2 PB14
SCLK2 PB13
DRIVER:X-CS PG13
DRIVER:Y-CS PG10
DRIVER:Z-CS PD5
DRIVER:E0-CS PD1
DRIVER:E1-CS PA14
DRIVER:E2-CS PG6
DRIVER:E3-CS PG3
DRIVER:E4-CS PD10
DRIVER:E5-CS PB12
Rows: 1 2 3 4
Four (4) Jumpers are needed for this mode.
Jumpers located in: columns MISO, CS, SCK, MOSI and rows 2 & 3.
WIFI Socket
ESP-12S
PIN-OUT of ESP8266 (ESP-12S ) CHIP
Onboard antenna
ESP-12S PINOUT
POWER
I/O
ADC
CONTROL
COMM. INTERFACE
PIN NUMBER
PWM
Marlin 2.0.x Firmware Changes:
In Platformio.ini file change: default_envs = FLYF407ZG
In Configuration.h file change:
#define SERIAL_PORT -1
#define SERIAL_PORT_2 1
#define MOTHERBOARD BOARD_FLYF407ZG
Note: Serial Port definitions in Marlin 2.0.x for this Board:
-1: USB Port; 1: UART Port;
6: If ESP8266 (ESP-12S) Chip is connected to WIFI Socket;
MAX6675
CS PA4
MISO1 PA6
SCK1 PA5
EN STEP DIR CS
X PE1 PB9 PE0 PG13
Y PG12 PB8 PG11 PG10
Z PD7 PA8 PD6 PD5
E0 PD4 PC7 PD3 PD1
E1 PD0 PC6 PA15 PA14
E2 PG8 PD15 PG7 PG6
E3 PG5 PD14 PG4 PG3
E4 PG2 PD13 PD11 PD10
E5 PD9 PD12 PD8 PB12
TO PREVENT A NOISY K-TYPE THERMOCOUPLE
Connect the Raspberry Pi via UART
In order to use the only hardware serial port of the Raspberry Pi, you need to disable the console function and map the hardware serial port to GPIO14 and GPIO15.
You can refer here:
sudo raspi-config
=> Interfacing Option
=> Serial
=> NO
=> YES
sudo nano /boot/config.txt
=> add this line :
dtoverlay=pi3-disable-bt
=> then
sudo reboot
sudo nano /boot/cmdline.txt
=> remove the word phase "console=serial0,115200" or "console=ttyAMA0,115200"
sudo reboot
The STM32F407 has three different boot modes which can be selected through the BOOT1 and BOOT0 pins, see Table 2:
Table 2. Boot modes
Boot mode selection pins
BOOT1 BOOT0 Boot mode Aliasing
x 0 Main Flash memory Main Flash memory is selected as the boot space
0 1 System memory System memory is selected as the boot space
1 1 Embedded SRAM Embedded SRAM is selected as the boot space
BOOT1 3.3V PB2 GND
BOOT0 3.3V GND
To understand more, please refer to pages 69-71 from the following document:
https://www.st.com/resource/en/reference_manual/dm00031020-stm32f405-415-stm32f407-417-stm32f427-437-and-stm32f429-439-advanced-arm-based-32-bit-mcus-stmicroelectronics.pdf
When the FLYF407ZG board is plugged into a computer, and it shows as an unidentified device, then the board doesn't have any firmware installed. Please see the "ISSUES" block.
VORON DESIGN
FPC
SPI2_MOSI FPC1 5V
SPI2_SCK FPC2 PB15
SPI2_MISO FPC3 PB13
FPC4 PB14
FPC5 PB10
FPC6 PE15
FPC7 PE12
FPC8 PE14
FPC9 PE10
FPC10 PE8
FPC11 PE7
FPC12 PE9
FPC13 PG1
FPC14 PG0
FPC15 PF15
FPC16 PB1
FPC17 PB14
FPC18 PF13
FPC19 PF11
FPC20 PB0
ISSUES
Some boards shipped are missing the bootloader. If your board has the Mellow logo on the back and when you place a 'firmware.bin' file on the SD card and it doesn't get converted, then yours is one of these boards. Follow the below steps to rectify this issue.
1. Download and install the STM32 software from https://www.stmicroelectronics.com.cn/ labeled "STM32CubeProgrammer software for all STM32."
2. Add two jumpers to the fly board as shown below:
3. Plug the board in by USB. It should show up in the device manager.
4. Open the STM32CubeProgrammer software and choose USB Port.
5. Download the latest copy of the bootloader from https://github.com/Mellow-3D/f407bootloader/releases
6. Open the bootloader in the STM32CubeProgrammer software by using the "Open File" tab.
7. Click the "Download" button as shown below.
8. Once complete, disconnect the Fly-F407ZG from the computer and remove the jumpers. It can now be used as normal.
EEPROM CHIP
24C02 in SOP-8 pkg
GND GND GND GND 24C02 U3 3.3 VDC GND I²C_SCL I²C_SDA
GND GND GND GND 24C02 U3 3.3V GND I2C_SCL I2C-SDA
http://ww1.microchip.com/downloads/en/DeviceDoc/21202j.pdf
MAX6675 CHIP Needed for K-Type Thermocouple
MAX6675ISA in SOP-8 pkg
SPI1_SCK SPI1_CS SPI1_MISO NC MAX6675 U1. 3.3 VDC T+ T- GND
PA5 PA4 PA6 NC MAX6675 U1. 3.3V T+ T- GND
https://www.mouser.com/datasheet/2/256/maxim%20integrated%20products_max6675-1179403.pdf
NOTE: Power the Raspberry Pi with a separate 5V PSU.
UART connector
"Screen Interface" connector on the FLYF407ZG board is the 'UART Connector'.
5V PSU*
5V GND PA9/PA1 PA10/PA0 RX
Raspberry Pi 3 Model B V1.2
* Important! Connect the DC 0V (typically labelled V-) on all of your DC power supplies together to ensure they all have the same voltage reference. If this is not done then it may be difficult to diagnose issues (devices may not turn on or may be damaged due to exceeding voltage limits).
How To Compile the Klipper Firmware for FLYF407ZG:
1. Connect to your printer via SSH
2. Run cd ~/klipper to change into the klipper directory
3. Run make menufconfig to enter the klipper firmware settings
See the picture below for the proper firmware settings:
How to Transfer the Klipper Firmware to FLYF407ZG:
1. Exit and save with Y.
2. Run make to compile the firmware.
3. Copy file out/klipper.bin to the SD card and rename to firmware.bin.
a) If you are running Mainsail or Fluidd you can run the following command to copy the firmware file to the 'config' directory allowing you to download it from the web interface:
cp out/klipper.bin ~/klipper_config/firmware.bin
OR
3. Use a tool such as cyberduck or winscp to copy the klipper.bin file off your pi, onto your computer.
4. Rename klipper.bin to firmware.bin
Important: If the file is not renamed, the bootloader will not be updated properly.
1. Ensure that your sdcard is formatted FAT32 (NOT EXFAT!)
2. copy firmware.bin onto the microSD card (if this card has previously been used for this process, remove all old firmware.bin and uid.bin files)
3. power down the FLYF407ZG
4. insert the microSD card
5. power on the FLYF407ZG
6. after a few seconds, the FLYF407ZG should be flashed
7. you can confirm that the flash was successful, by running ls /dev/serial/by-id. If the flash was successful, this should now show a klipper device, similar to:
/dev/serial/by-id
usb-Klipper_stm32f407xx_2D0024001850435133323235-if00
(note: this test is not applicable if the firmware was compiled for UART, rather than USB)