EMBEDDED SYSTEM FOR QUADRICOPTER

Technical Report #2

FLYMAPLE CONTROLLER BOARD
HARDWARE SETUP & CONFIGURATION

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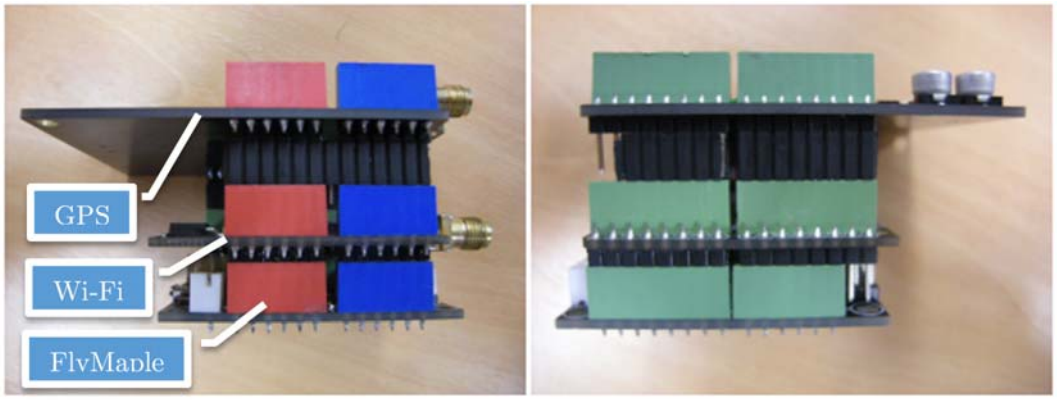
Introduction

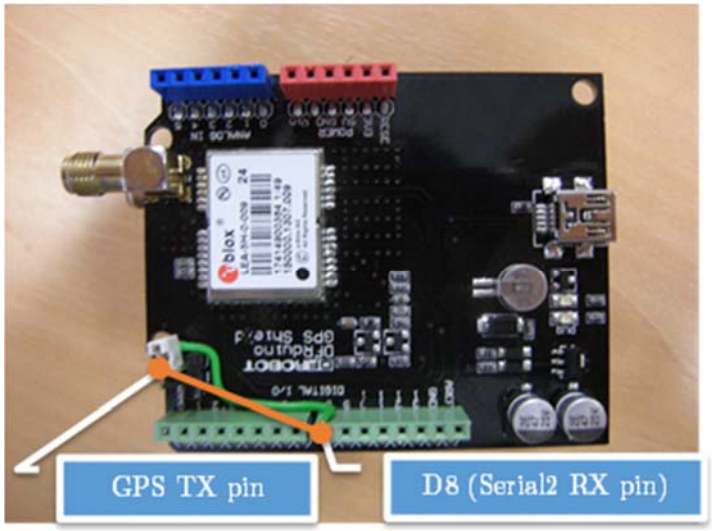
This technical report is a part of the PFE Quadricopter. In this report, you can find information about:

- Hardware setup: how to connect the shields (Wi-Fi, GPS) to the controller board. Power specification for each.
- Wi-Fi shield configuration:
  - The program to establish a bridge between serial port and USB port on FlyMaple board, in order to forward data from SerialUSB port (which is connected with the PC) to Serial2 port (which is connected with Wi-Fi shield), and vice versa.
  - The AT commands for configuring the Wi-Fi shield.

1 Hardware Setup



Stack the boards together as shown in the figure above. Notice that the pin on the GPS shield should be re-routed: the TX pin of GPS must be connected with the RX pin of FlyMaple's Serial2 port, as shown in the figure below.



In summary, these pin are connected with each other:

FlyMaple	Wi-Fi shield	GPS shield
GND	GND	GND
Vin	Null	Vin
+5V	+5V	Null
D0 (Serial1 RX – in)	D0 (Wi-Fi TX – out)	Null
D1 (Serial1 TX – out)	D1 (Wi-Fi TX – in)	Null
D8 (Serial2 RX – in)	Null	D8 (re-routed GPS TX – out)

("Null" means event if the pin headers of two board are stacked together, the pin is not connected to any line on the PCB.)

Powering

Board	Regulator		Power Range	Powering Pin
FlyMaple	78M05 HT7833	(5 V out) (3.3 V out)	7 to 12 V	Vin
Wi-Fi shield	LM1117-3.3V	(3.3 V out)	5 to 20 V	+5V
GPS shield	HT7833	(3.3 V out)	–0.3 to 13 V	Vin

2 Wi-Fi Configuration

2.1 The Bridge Program

Upload this sketch into the FlyMaple controller board and run to establish a bridge between the Serial2 and SerialUSB port.

```
unsigned char inByte;

void setup()
{
  pinMode(BOARD_LED_PIN, OUTPUT);
  Serial2.begin(115200);
}

void loop() {
    byte data_in = 0;
    while (SerialUSB.available()) {
      inByte = SerialUSB.read();
      Serial2.print(inByte, BYTE); // Forward received command to Serial2
      data_in = 1;
    }
    if (data_in) {
      Serial2.println();
      data_in = 0;
      toggleLED();
    }

    while (Serial2.available()) {
      inByte = Serial2.read();
      SerialUSB.print(inByte, BYTE);
      toggleLED();
    }
}
```

2.2 The AT Commands

```
AT+WD
AT+WAUTO=0,<SSID>
AT+WAUTH=0
AT+WWPA=<Password>
AT+NDHCP=1
AT+NAUTO=1,1,,4000
AT+XDUM=1
ATC1
AT&W0
AT&Y0
```

Current SSID: “Augustine-l”. Current WPPA: “12457801”.
You can refer
www.dfrobot.com/wiki/index.php/WiFi_Shield_V2.2_For_Arduino_(SKU:TEL0047)#Config_the_WIFI_shield_setting_via_USB_com_port for more details in AT commands.