



**USER MANUAL
Hyperion F3 LUX FLIGHT CONTROLLER**

F3 LUX Flight Controller provides high quality flight control using Hyperion's high standards and technological expertise. Please read this manual before soldering or configuring your Flight Controller.

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Specifications and Features

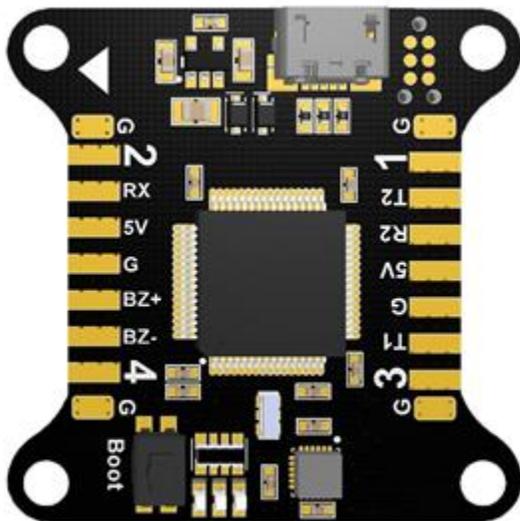
- **F3 Processor**
- **MPU6000 ACC/Gyro Sensor connected with SPI**
- **Supports 2S-6S LiPo battery Input**
- **Onboard 5V (2A) / 12V voltage regulators with LC Filter**
- **RX: SBUS, PPM, Spektrum Sat**
- **6 ESC output – Supports Hexacopter**
- **ILAP transponder**
- **RSSI and Current Sensor Input (still requires an sensor)**
- **Size: 36mm x 36mm**

Although being a stand-alone FC without PDB capability, it has basic 5V BEC as well as 12V voltage regulator (with LC filter). That allows you to power the FC directly from battery, and it cleans up the wiring as you won't need to

connect additional VBAT cables. The 12V output can be used to power your FPV gear, a pretty neat solution.

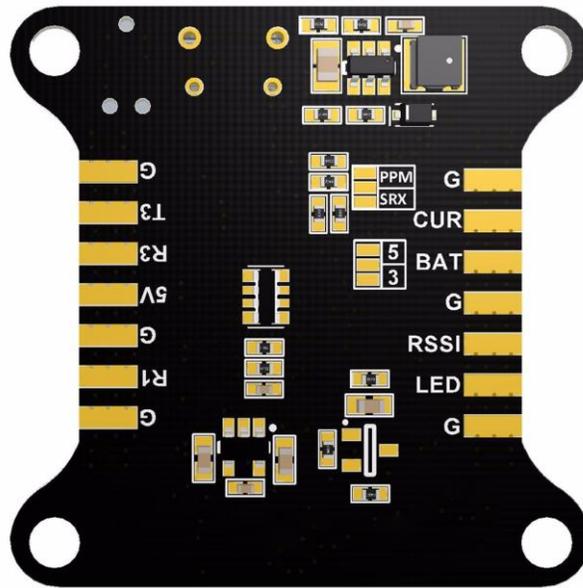
It has a bootloader button for easy firmware flash. The board is similar in shape to the Lumenier LUX F3.

Board Top side Layout



Pin	Function
G	Ground
2	PWM Output (Motor 2)
RX	RX Input (PPM,S.BUS, SUMD / 3.3-5v / GND)
5v	Receiver Voltage (3.3v-5v)
BZ+	Buzzer +
BZ-	Buzzer -
4	PWM Output (Motor 4)
1	PWM Output (Motor 1)
T1/T2/R2	UART1 TX, UART2 TX, UART2 RX
5v	5v output
3	PWM Output (Motor 3)

Board bottom side layout



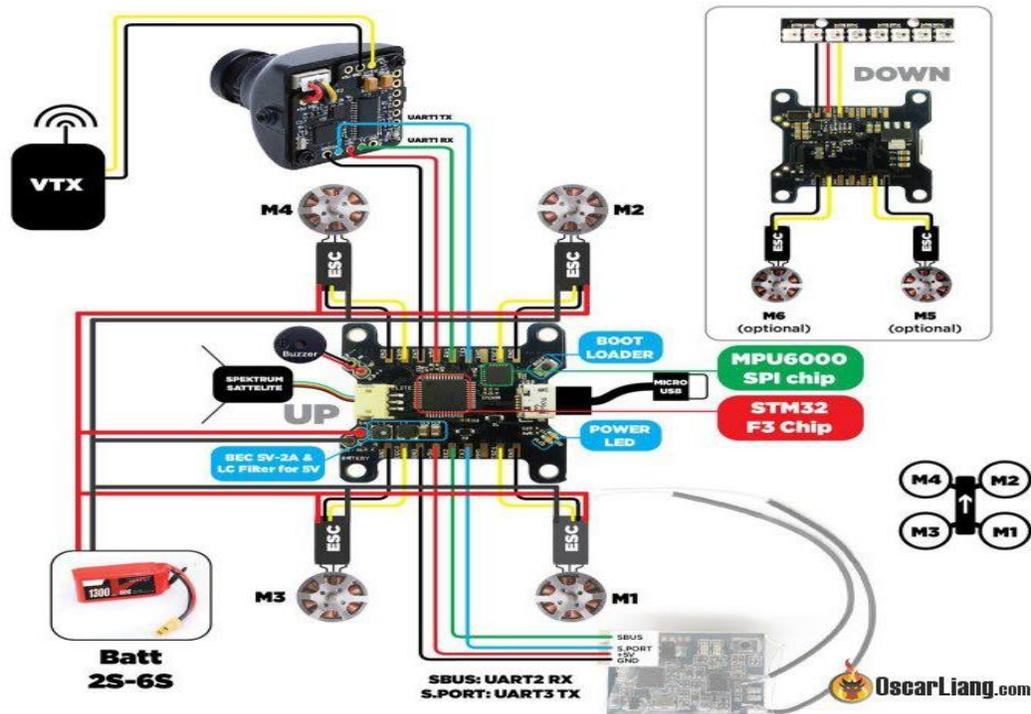
Pin	Function
G	Ground
T3/R3/R1	UART3 TX, UART3 RX, UART1 RX
5v	5v Output
CUR	Current Sensor
BAT	Input voltage 6-26v (2-6S lipo)
RSSI	RSSI
LED	Digital LED Output
PPM/SRX	Bridge PPM for PPM. SRX for SBUS, SUMD and serial connections

The accelerometer and gyroscope need to initialize every time the board is given power.

- Do not disturb the **LUX** board or your quad while powering on.
- Wait until the initialization sequence is completed. When the activity LEDs settle, you can move the quad/board.

Do not use F3 LUX for unintended applications such as commercial aerial photography.

BASIC Hardware Setup



Pins Configuration and Connections

Make sure to select your RX input and logic level by bridging the appropriate jumpers.

- Bridge only 3v for SPEKTRUM satellite.
- Bridge only 5v for Futaba, FRSKY S.BUS, ORANGE, etc. (no signal inverter needed).
- Select PPM for PPM, or SRX for Serial RX.
- The 3v jumper only changes voltage output for 5v pad next to **RX**.

Connect ESC signal wires

- Connect the corresponding ESC signal wires to pins **1, 2, 3, 4** as shown on page 4.
- Ground wires can be connected to the pins labeled **G**.

Connect RX

- Connect signal (PPM/SRX), power (3.3-5V), and GND pins to your receiver.

Enable Telemetry

- Connect RX port on Receiver to UART pin **T1, T2, or T3**.
Enable feature in CLI: **feature TELEMETRY**

In the **Ports** tab in Cleanflight, select the **Telemetry** dropdown to output data on selected UART.

Connect Buzzer

- Connect buzzer +/- to pins **BZ+** and **BZ-**.

Connect Blackbox Device

Open Log serial data loggers work over simple serial connections and support microSD cards up to 64GB. Your **LUX** flight controller has **3** separate hardware serial (**UART**) TX/RX pin pairs.

- Connect VCC/TX/RX/GND to corresponding pins labeled **T1/R1/T2/R2/T3/R3**.

Enable feature in CLI: **feature BLACKBOX set blackbox_device = 0**

In the **Ports** tab in Cleanflight, select the checkbox to enable Black box on the **UART** you choose. It is recommended **not** to connect a wire from **TX** pin on Open Log logger to **RX** pin on **LUX**.

Connect LED Strip

You can connect an addressable LED strip (WS2812B) to the **LUX** flight controller. Connect your LED strip to pins labeled **LED**.

Enable feature in CLI: **feature LED_STRIP**

Connect Battery (Main Power connection)

Your **LUX** flight controller has input voltage 6-26v (2-6S lipo). Connect main power lead to pins labeled **10**.

* Always check the polarity before plugging in. There is no reverse polarity protection.

Enable feature in CLI: **feature VBAT**

Connect Current Sensor

Connect a current sensor signal wire to the pin labeled **9**, and corresponding

GND wire.

Enable feature in CLI: **feature CURRENT_METER current_meter_type 1**

Connect OSD (On Screen Display)

You can connect a compatible OSD to your **LUX** flight controller. Connect the corresponding **TX** and **RX** pins to UART1 labeled **T1/R1**.

_For MWOSD, remember to change Voltage/Amperage/RSSI to **"Use FC"**.

Connect RSSI

Connect RSSI pin from your receiver to **LUX** pin **RSSI**

Connect GPS

GPS features in Cleanflight are experimental. Please share your findings with the developers. GPS works best if the GPS receiver is mounted above and away from other sources of interference. Connect GPS TX/RX/5v/GND pins to corresponding **TX** and **RX** pins (TX to RX, RX to TX). Enable feature in CLI: **feature GPS**

set gps_provider = 0 (nmea only)
set gps_provider = 1 (UBLOX only)

Software Installation/Setup

Hardware Driver

Your Hyperion **LUX** has a Micro-USB connector. Hold the "boot" button while plugging in for the first time. The LUX has two modes. It switches to "DFU" mode while the "boot" button is pressed as it is plugged in.

Windows users:

- Download Zadig from <http://zadig.akeo.ie>
- Open Zadig, choose Options > List All Devices
- Select STM32 Bootloader, WinUSB
- Click "replace driver" or "install driver"

Mac/Linux users:

Driver will install automatically

Cleanflight Configurator

Cleanflight Configurator from the Google Web Store will be used to configure your Hyperion F3 **LUX** board.

- Download: <http://chrome.google.com/webstore>

Alternative Firmware Upgrade

Should Cleanflight Configurator stop working with your device, or your device becomes corrupted, you can restore **LUX** to factory defaults with a standalone utility.

Windows users:

Firmware upgrade utility - <http://bit.do/LUXDfuSe>
Use drivers from Windows Update

Mac & Linux:

- "DFU Util" "dfu-util" from the command line.

ADVANCED FEATURES

PID Stick Tuning (OSD)

MW OSD

Your **LUX** flight controller can be programmed via stick positions, using your OSD (On Screen Display) to display and change settings.

To access the OSD menu, make sure your **LUX** board is disarmed. Move the **Throttle** position to middle, **Yaw** right, **Pitch** up. Change PID settings by using **Pitch/Roll** for selecting a value, and **Yaw** for changing the selected value.

Firmware Upgrade

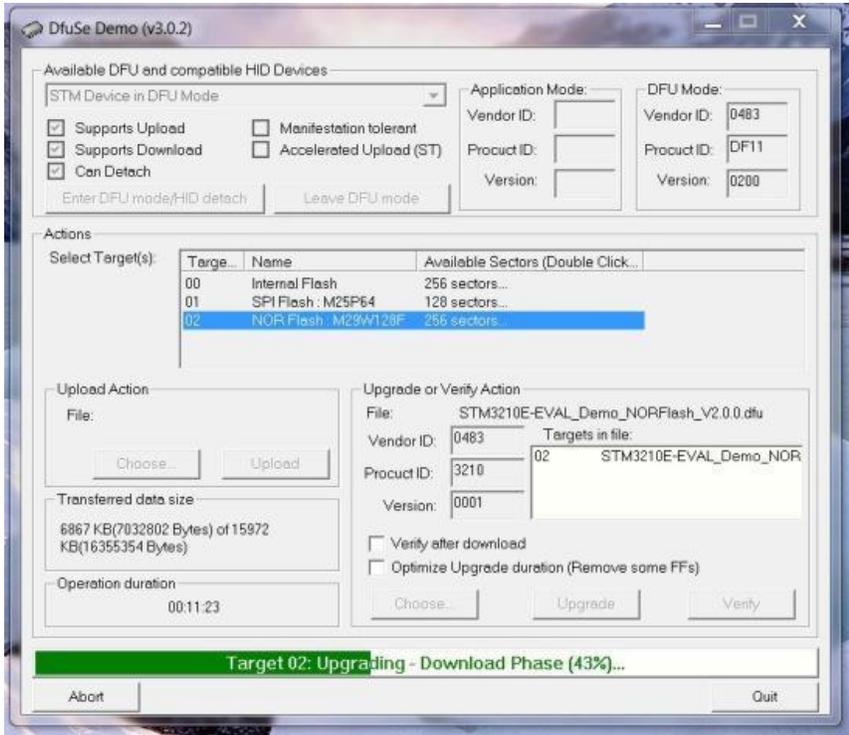
STM32 DFU MODE

Your **LUX** board can always be recovered and restored to factory defaults should you ever encounter software issues. Simply hold the "boot" button on your **LUX** board while plugging in the USB cable. You can release the button after plugging **LUX** into your computer.

STM32 DFU FLASH TOOL:

<http://bit.do/LUXDfuSe>

Follow the installer prompts, then select your device and firmware file. Windows users will need to uninstall the Zadig driver listed on page 8.



Note:

The gyro used on the LUX is very fast and sensitive. Due to this you can experience a weird twitching when throttling up. The solution to that is soft-mounting the LUX. If you use the included O-rings to mount the LUX you should only tighten the screws until the tension holds the screws in place. The O-ring should not compress when tightening the screws. You can also use two-sided foam tape to hold the LUX if that's your mounting method of choice.

The first step is to install the Drivers:

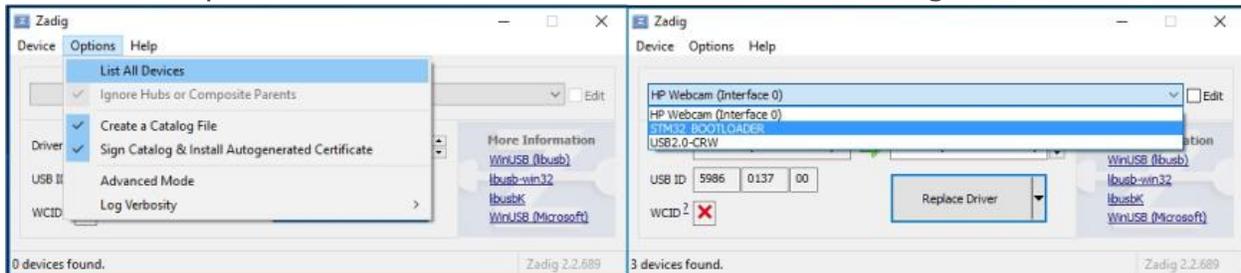
Install the VCP Drivers

from <http://www.st.com/web/en/catalog/tools/PF257938>

- Reboot your computer so the drivers can take effect.
- Download Zadig from <http://zadig.akeo.ie>

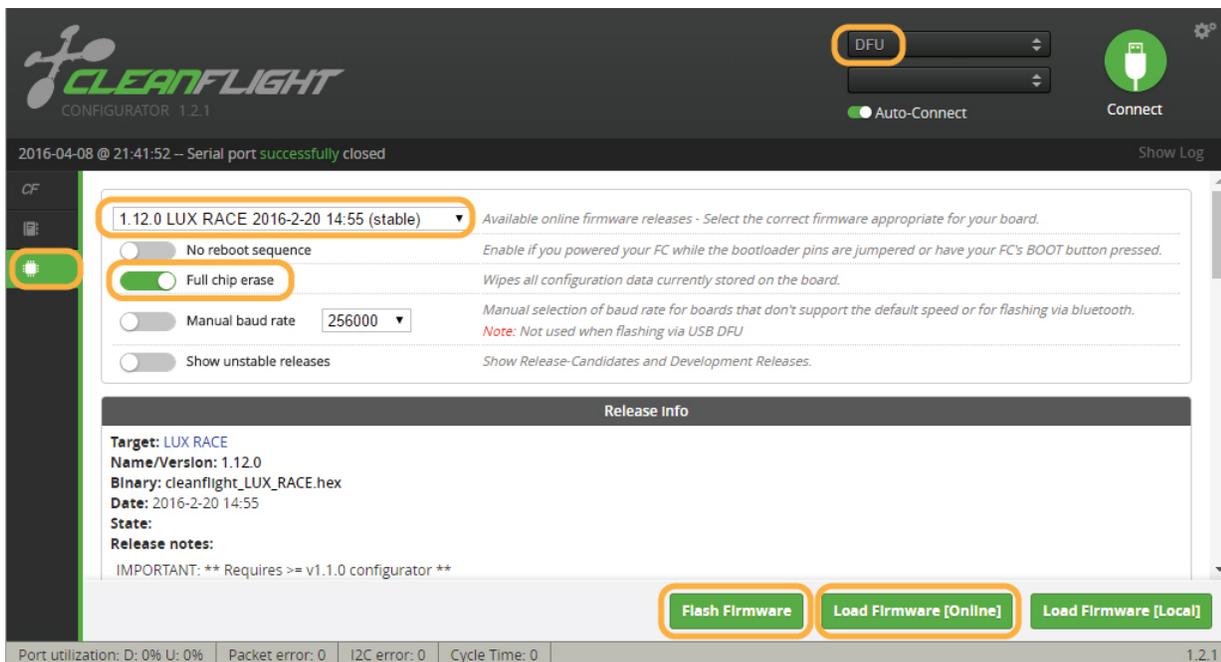
- **Close all instances of chrome (this includes chrome apps such as cleanflight).**
- Hold the Bootloader Button and connect the board to your PC via USB. (Once the board is on you should see a solid blue light and you can let go of the button.)
- Open Zadig, choose Options > List All Devices
- Select STM32 Bootloader, WinUSB
- Click "replace driver" or "install driver"

The next step is to flash the board with the latest Cleanflight:



Open Cleanflight and re-connect the flight controller while holding the bootloader button. (You should see DFU in the port selection area).

Open the Firmware Flasher tab and select LUX_RACE target, enable Full chip erase, then click "Load Firmware [Online]" Once the Flash firmware is Green, confirm that the correct target was loaded and then press the "Flash Firmware" button.



TROUBLESHOOTING

Getting SBUS receiver to work?

Assuming everything is wired correctly and the jumpers are bridged accordingly, you likely will need to switch some ports around in cleanflight.

1. Connect the Flight controller to cleanflight and navigate to the ports tab.
2. Disable MSP on UART1
3. Disable Serial RX on UART2
4. Enable Serial RX on UART1 and Save Settings.
5. Then go back to the configuration tab and confirm that Serial_RX is still selected.
6. Confirm that the receiver is working on the Receiver Tab.

Identifier	Data	Logging	Telemetry	RX	GPS
USB VCP	<input checked="" type="checkbox"/> MSP 115200 ▾	<input type="checkbox"/> Blackbox 115200 ▾	Disabled ▾ AUTO ▾	<input type="checkbox"/> Serial RX	<input type="checkbox"/> 57600 ▾
UART1	<input type="checkbox"/> MSP 115200 ▾	<input type="checkbox"/> Blackbox 115200 ▾	Disabled ▾ AUTO ▾	<input checked="" type="checkbox"/> Serial RX	<input type="checkbox"/> 57600 ▾
UART2	<input type="checkbox"/> MSP 115200 ▾	<input type="checkbox"/> Blackbox 115200 ▾	Disabled ▾ AUTO ▾	<input type="checkbox"/> Serial RX	<input type="checkbox"/> 57600 ▾
UART3	<input type="checkbox"/> MSP 115200 ▾	<input type="checkbox"/> Blackbox 115200 ▾	Disabled ▾ AUTO ▾	<input type="checkbox"/> Serial RX	<input type="checkbox"/> 57600 ▾

How do I get my LUX to "Save and Reboot"?

Right now cleanflight is not able to reboot the LUX completely, to complete the process you should do the following:

Press the red Disconnect button in cleanflight.

Unplug your LUX from the computer and wait a few seconds.

Connect the LUX back to the computer and navigate to the settings you just saved to confirm the save.