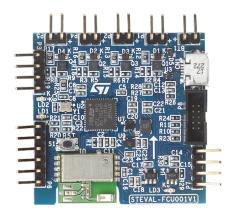




Flight controller unit evaluation board for toy drones



Features

- Compact flight controller unit (FCU) evaluation board complete with sample firmware for a small or medium sized quadcopter
- On-board LiPo 1-cell battery charger
- Possibility to directly drive 4 DC brushed motors through the low voltage onboard MOSFET or alternatively use external ESC for DC brushless motor configuration
- · Main components:
 - STM32F401 32-bit MCU with ARM® Cortex®
 - LSM6DSL iNEMO intertial module: 3D accelerometer and 3D gyroscope
 - LIS2MDL High performance 3D magnetometer
 - LPS22HD MEMS pressure sensor: 260-1260 hPa absolute digital output barometer
 - SPBTLE-RF Very low power module for Bluetooth Smart v4.1
 - STL6N3LLH6 N-channel 30 V, 6 A STripFET H6 Power MOSFET
 - STC4054 800 mA standalone linear Li-Ion battery charger
- · RoHS compliant
- WEEE compliant

Description

The STEVAL-FCU001V1 is designed to support quadcopter drone designers.

A complete sample firmware project allows the designer to begin flying small or medium sized quadcopters (with brushed or brushless DC motors) immediately and evaluate the performance of the IMU sensors under real flight conditions.

The FCU can be controlled by a standard external remote controller (PWM input interface) or by a smartphone or tablet through the on-board Bluetooth low energy module (CE, FCC, ARIB, BQE certified).

Magnetometer and pressure sensors are also embedded to support 3D navigation applications.

SWD, I²C and USART connectors are available for firmware development and debugging, and to support additional external sensors or RF modules.

Product summary		
Flight controller unit evaluation board for toy drones	STEVAL- FCU001V1	
iNEMO 6DoF inertial measurement unit	LSM6DSL	
Magnetic sensor, digital output, 3-axis magnetometer	LIS2MDL	
Piezoresistive absolute pressure sensor digital output barometer	LPS22HD	
Very low power module for Bluetooth Smart v4.1	SPBTLE-RF	
N-channel, STripFET H6 Power MOSFET	STL6N3LLH6	
800 mA standalone linear Li-lon battery charger	STC4054	
Drone remote controller app for Android	AppDrone	
Reference design firmware for mini drones	STSW-FCU001	

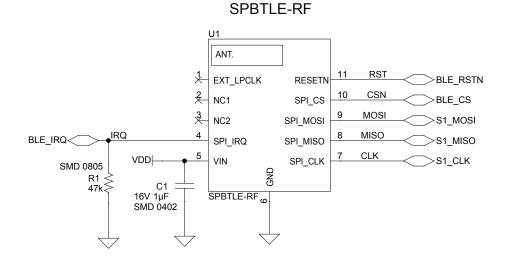


1 Schematic diagrams

LD39015 CN1 STC4054 P8 3V3 SPBTLE-RF Micro LDO JTAG Battery charger USB connector BLE module LiPo 1-cell P1, P2, battery P4, P5 BT1 SPI2 4 x 3-ph ESC x 4 USB **JTAG** motor A + G IMU SPI1 LSM6DSL TIM4 DC Power MOS x4 PWM out motor STL6N3LLH6 Magnetometer LIS2MDL 32-bit MCU P1, P2, P4, P5 **PWM** TIM2 input Remocon RX* capture LPS22HD Pressure Sensor P6 I2C UART UART1 12C2 connector connector P7 P3 STM32F401

Figure 1. STEVAL-FCU001V1 – block diagram

Figure 2. STEVAL-FCU001V1 – circuit schematic (1 of 4)



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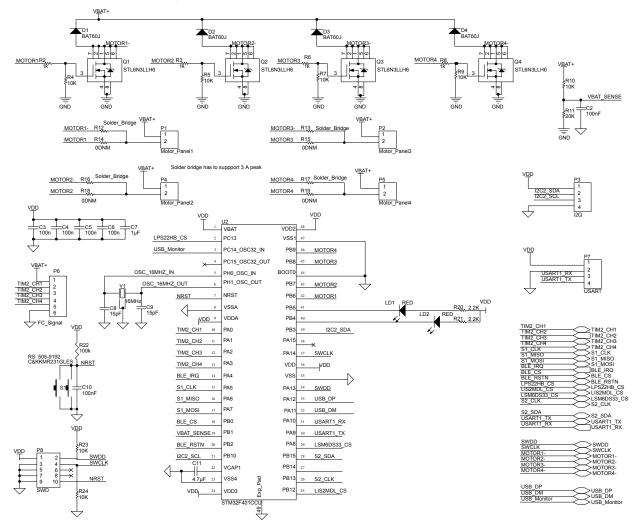


Figure 3. STEVAL-FCU001V1 – circuit schematic (2 of 4)

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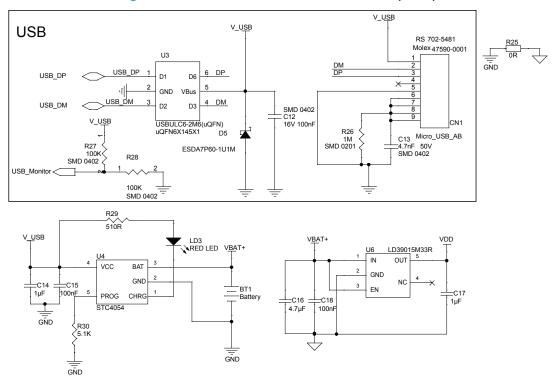
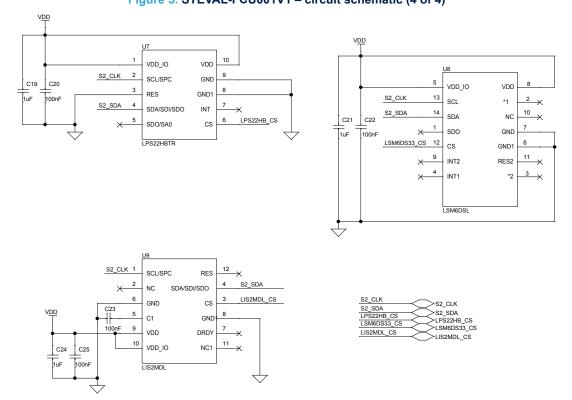


Figure 4. STEVAL-FCU001V1 – circuit schematic (3 of 4)

Figure 5. STEVAL-FCU001V1 – circuit schematic (4 of 4)



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Revision history

Table 1. Document revision history

Date	Version	Changes
03-Oct-2017	1	Initial release.
16-Jan-2019	2	Updated cover page image.

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