

KIT-HGDRONEK66 Drone Kit

Product Overview

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For the most up-to-date information, visit www.mouser.com or the supplier's website.

Description

NXP HoverGames Drone System is a modular, single and flexible NXP development platform that comes with an RDDRONE-FMUK66 flight management unit at its base. The KIT-HGDRONEK66 Drone provides mechanical and other components needed to evaluate the RDDRONE-FMUK66 and this drone is a complete carbon fiber quadcopter drone. The KIT-HGDRONEK66 is a DIY professional development kit that requires a detailed assembly but the software is not included. The RDDRONE-FMUK66 flight management unit adds BLDC motor control capabilities, a mechanical platform that can be mounted on the Drone Kit. After assembling the frame has appropriate additional space to mount other components such as an adapter for Rapid IoT, NXP Freedom boards, or a companion computer such as i.MX 8M Mini to be used as a vision processor running Linux and ROS.



The RDDRONE-FMUK66 is an NXP flight controller that uses 180MHz Kinetis K66 and it was previously known as the NXPhlite FMU. The RDDRONE-FMUK66 is compliant with Dronecode.org and PX4.io software which is an experimental flight management unit that uses PX4 extensively for research and commercial drone platforms. FMU is versatile and can run other open source or proprietary flight stacks and it also contains DCD-LZ debug adapter and cable with Segger J-Link Mini EDU, RC radio adapter cable, M8N GPS module with Buzzer alarm, arming switch, and also a power module for a 3S battery. Sensor fusion with GPS and other positioning inputs is performed for autonomous navigation to mission waypoints.



The HGD-TELEM915 (Americas) and HGD-TELEM433 (Europe) telemetry radio sets are needed for full functionality of the kit. Depending on location, the user needs either a 915MHz or 433MHz setting.

Features

KIT-HGDRONEK66 Drone Kit Features:

- Carbon fiber mechanical frame approximately 500mm diagonal size
- 150mm x 150mm large top and bottom plate for mounting electronics
- Dual 10mm diameter rod x 60mm rail mounting system
- No software is provided by NXP Supported by the open source project PX4
- Supports expansion using a Linux companion computer for Vision, ROS, Artificial Intelligence
- Supports connection to Rapid IoT with add-on adapter board

RDDRONE-FMUK66 Reference Design Board Features:

- Proven business friendly open source software with available enterprise support PX4 and Q Ground Control
- Supports all airframes and it's used for Quadcopters, Hexacopter, VTOL, planes, rovers, cars, and other robots
- Open, flexible for development and also suitable for bare-bones or other vehicle stacks, the addition of companion computer with Vision, and many peripherals such as GPS, RTK-GPS, UWB, Telemetry radios, LTE, Bluetooth Low Energy, radar, ultrasonic, and lidar
- Can interface with NXP Rapid IoT and operate pre-planned GPS waypoint missions
- High-bandwidth interfaces and Unique automotive peripheral interfaces support light weight two-wire 100Base-T1 Ethernet and dual CAN and is included in complete reference drone kit KIT-HGDRONEK66
- Use Drone Code SDK co-operating with an NXP i.MX, S32x, or companion computer running Linux, ROS, and MAVROS
- MAV Link telemetry to the ground station and supports RTK GPS
- UAS Traffic Management (UTM) services through Air map platform SDK

HGD-TELEM433 and HGD-TELEM915 Peripheral Features:

- For drone kit communications to Q Ground Control software
- Each part number includes two radios, one for PC (USB) and one for on-drone (Serial)

Applications

- UAV data buses and battery management
- UAV intermediate flight controller
- UAV vision, advanced sensing and processing board
- Unmanned vehicles (ground, air, water)

The diagram illustrates the hardware architecture of a drone system. At the center is the **Flight Management Unit RDDRONE-FMUK66 (PX4 Supported)**, which is green, indicating it is 'Required, Not included'. It connects to several key components:

- Linux Companion Computer** (Grey, 'Optional, Not included'): Connected via UART/USB/ETH.
- CAN Peripherals** (Grey, 'Optional, Not included'): Two units connected via CAN1 and CAN2.
- 2-Wire Ethernet Peripherals** (Grey, 'Optional, Not included'): Connected via 10BaseT1.
- GPS + Compass Module** (Blue, 'Included in Kit'): Connected via UART, I2C, and GPIO.
- Telemetry Radio*** (Yellow, 'Required, Not included'): Connected via UART. A note specifies: '* Purchase either HGD-TELEM433 or HGD-TELEM915 Both Drone and PC side included.'.
- 10 Channel RC Receiver** (Blue, 'Included in Kit'): Connected via RC S-BUS or PPM.
- 12-Channel RC Transmitter** (Blue, 'Included in Kit'):
- ESC (4x)** (Blue, 'Included in Kit') and **Motor (4x)** (Blue, 'Included in Kit'):
- Power Distribution Board** (Blue, 'Included in Kit') and **Power Module** (Blue, 'Included in Kit'):
- 3S/4S LiPo Battery** (Yellow, 'Required, Not included'):
- SD Card** (Blue, 'Included in Kit'):
- Peripheral Modules** (Blue, 'Included in Kit'): GPS + Compass Module, I2C RGB LED, Safety Switch + LED, and Buzzer.
- Debugging Tools** (Blue, 'Included in Kit'): Debugger, USB-UART Console Cable, and DCD Debug adapter (Yellow, 'Required, Not included').
- Frame, Propellers and Miscellaneous Tools** (Blue, 'Included in Kit'):

Legend:

- NXP included in Kit
- Included in Kit
- Required, Not included
- Optional, Not included

The diagram illustrates the Kinetis K66 (P4) microcontroller at the center, connected to various external components. The components are color-coded: green for NXP Technology, grey for Interface, and dashed boxes for Optional components. Solid lines represent signals, and dashed lines represent power connections.

- Left Side (Interfaces):**
 - SWD Debug + System Console (Signal)
 - 100BaseT1 Ethernet (Signal)
 - 2x CAN (UA/CAN) (Signal)
 - USB QCG Console (Signal)
 - RC Input PPM/SBUs (Signal)
 - Telemetry UART port (Signal)
 - External PWR module (Signal)
- Top (Interfaces):**
 - JTAG/SWD+UART (Signal)
 - FRAM (Signal)
- Right Side (Interfaces):**
 - SPI Accelerometer + Magnetometer (Signal)
 - SPI Gyrometer (Signal)
 - PC Barometer (Signal)
 - IRDA IR/IRDA port (Signal)
 - Timer Ultrasonic Sensor port (Signal)
 - PC External NFC port (Signal)
 - ADC External Analog (pressure) port(s) (Signal)
 - UART+PC GPS + compass port (Signal)
 - SPI External SPI port (Signal)
 - GPIO BiDi Level Translators (Signal)
 - 6x RC PWM Output (GPIO) (Signal)
- Bottom (Interfaces):**
 - Arming button and buzzer ports (Signal)
- Internal/Peripheral Blocks:**
 - 2wire ETH phy (NXP Technology)
 - 2x CAN (NXP Technology)
 - USB (NXP Technology)
 - Secure Element (Optional, NXP Technology)
 - Kinetis K66 (P4) (NXP Technology)
 - Flex TIMER/UART (NXP Technology)
 - UART (NXP Technology)
 - SYS Power (NXP Technology)
 - Vreg (NXP Technology)
 - PWR module voltage and Current Sense (NXP Technology)
 - ADC (NXP Technology)
 - SDHC (NXP Technology)
 - SD Card Logging (Optional, NXP Technology)
 - GPIO (NXP Technology)
 - RGB LED (NXP Technology)
 - Indicator LEDS (NXP Technology)

Legend:

- CP Technology (Green)
- NXP Technology (Green)
- Interface (Grey)
- Optional (Dashed Box)
- Signal (Solid Line)
- - - Power (Dashed Line)