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Multiwii flight controller

MultiWii's code is free, easy to use, and it supports many (most) builds.Download Multiwii and the Arduino IDE. Connect the flight controller to your computer. On the computer, open the already downloaded MultiWii folder and open the Arduino file called "MultiWii.ino". Access to the tab "config.h" and delete the "//", selecting the desired type of multirotor.Scroll down and enter the minimum and maximum values of your transmitter.Uncomment the sensors used.Next, follow the instructions commented throughout the file.After that, on the top menu of the IDE, click on Tools, Boards, and select the Arduino micro-controller you're using. Then, click on Tools, Port, and select the computer's port that your controller is on. Upload the Multiwii code by clicking the button shaped like an arrow.After uploading, text "uploaded successfully" should appear on IDE. The MultiWii PRO is a gyro/accelerometer based flight controller that is loaded with features. This version of the MultiWii supports direct connection of a GPS module allowing for ultra-precise positioning functionality. With expandability options and full programmability, this device can control just about any type of aircraft. This is the ideal flight controller for your multi-rotor aircraft. These are pre-configured, flashed with the correct settings and tested to make them Plug and Play with nearly any ESC. This is NOT normally done in any other store! Features: SMD component design with Atmega2560 ITG3205 Triple Axis Gyro BMA180 Accelerometer BMP085 Barometer HMC5883L Magnetometer Servo output for camera pitch and roll control Supports direct connection of GPS module On-board USB connection for programming Specs: Standard Mk style mounting holes 45mm X 45mm Dimensions: 70x50x12mm Weight: 16g Get all the firmware, stick commands, drivers, documents, arduino1.0.3, everything you need to fly in one place! Thanks to the internet and smartphone apps, there are now more ways to check in for your flight than ever before. In most cases, you can use the airline's online check-in service up to 24 hours before your flight.How to Check in OnlineChecking in online is quick and easy, and it saves you time at the airport. Up to 24 hours before your flight, go to the airline's check-in page and enter your name and ticket number. After you're logged in, you can opt to check in right away or add baggage and seat upgrades. Once you've checked in, you can print out your own boarding pass. When you get to the airport, you simply have to take your checked baggage to the airline's baggage drop-off desk before you go through security and board the plane. You should still leave yourself one or two hours to get through security and navigate your way through the airport.How to Check in with an AppChecking in with an app is very similar to using an online check-in service. Go to the Apple App Store or Google Play Store and search for your airline. Download the app and use the check-in option. Some larger airlines such as United also let you use their apps to check in for flights with partner airlines. Most airlines give you a ticket directly through the app once you've checked in.How to Check In at the AirportIf you're not particularly tech savvy, you can still check in at the airport. Most airlines set their own minimum check-in times, but 45 minutes for domestic flights and one hour for international flights are fairly standard times, but you should check with your airline beforehand to see if you need to leave yourself more time. Be sure to leave yourself some extra time in case there is a line. Some airlines offer self-service check-in kiosks. To use these, enter your name and ticket number, follow the prompts and print out your ticket. If you want to talk to a real person, go to the airline's check in desk, present your ID and reservation number and give the attendant your bags.What Are the Benefits of Online Check-In Services?Online check-in services let you skip the lines, and since you can choose your own seat, you have a bit more control over where you sit. Checking in as early as possible helps you get the best seating available.When Is Online Check-In Not an Option?Online check-in is not an option for people traveling in big groups or who have special needs during the flight. This just gets a bit too complicated, and someone at the check-in counter can help make sure everyone has proper identification and that the right amenities are on board to make you comfortable during your flight. MORE FROM QUESTIONSANSWERED.NET MultiWii is a general purpose software to control a multirotor RC model. It can now use various sensors but was initially developed to support Nintendo Wii console gyroscopes and accelerometers. We can find these sensors in the extensions of the Nintendo WiiMote: Wii Motion Plus and Wii Nunchuk. This project was an opportunity to develop my own software on an Arduino platform. The achieved stability is excellent for FPV and allows any kind of acrobatics. The software is for the moment able to control a tricopter, a quadcopter or a hexacopter. The tricopter mentioned in this article is mainly is the first tricopter I made, based on a fiber structure. The structure was reinforced with carbon/kevlar fiber. Some LEDs were also added for a better flying visibility. Contents A Wii game controller is composed of three accelerometers to determine an angular position, and measure lateral accelerations. It is enough for most games, but an accelerometer is not very accurate for measuring small variations. For the most demanding games, Nintendo developed the Wii Motion Plus (WMP) extension which uses three gyroscopes and plugs at the extremity of the game controller. These three gyroscopes coupled with three accelerometers can determine more precisely the attitude of the controller. There is extensive information on all the extensions here: On a multicopter, the use of accelerometers is a plus but not necessary if you do not want to keep strictly to its angular position in space. The measurement of angular velocity is sufficient to ensure good stability. The extension Wii Motion Plus has numerous advantages compared to other gyroscope sensors: Invensense is a manufacturer of electronic components, particularly gyroscopes. Usually, these components are distributed independently and are relatively expensive. Example from Sparkfun: Invensense manufactures (at least 1 of 2) gyroscopes of the Wii Motion Plus: DG600 or DG650. They seem to have been designed specifically with a probably very low wholesale price. We benefit directly from this situation in the cost of the extension, especially since there are many Chinese copies that can be found for \$10 or \$15 The Wii Motion Plus extension is made up of two pairs of 2-axis gyroscopes, (only one axis being used on one gyroscope). Finally, once the PCB is extracted from the WMP case, there is a set of 3-axis gyroscopes in a small space. More importantly, they are all mounted on a plane surface without additional PCB. Copies are not all identical, but the dimensions remain the same. When we want to interpret the value of sensors, we use an analog input and then convert it into a digital format usable by a program. Wii Motion Plus extension includes a 14-bit analog-digital converter. This extension communicates with the controller on a I2C bus in fast mode at 400kbit/s. It's interesting because this bus coupled to the integrated ADC allows for performing conversion that will not be addressed later by the micro controller. Moreover this bus uses only 2 data wires. At that price, performances are not the best among the existing modern gyroscope. Noise (spurious signals in the absence of movement) is important, but we can find 3 MEMS sensors that outperform the piezo gyros still found in many RC gyroscopes. Properly filtered, the signal is pretty accurate. FYI, the must have gyro seems to be the ADXRS610, and at that price it has only one axis : The Nunchuk (NK) is an extension of a WiiMote which is is composed of three accelerometers to determine an angular position, and measure lateral accelerations. On a multicopter, the use of accelerometers allows to know precisely the angular position of the model. With some mathematic used to associate gyroscopic sensors (DCM or Kalman like), it is possible to determine very quickly a PITCH and a ROLL angle. This feature is used to have an auto stable mode which keeps the model in a horizontal attitude. Like the Wii Motion Plus, the Nunchuk has also numerous advantages: It is even cheaper than a Wii Motion Plus extension. We can find the NK extension for around \$10 on ebay. The PCB size of a Nunchuk is a little bit more important than a Wii Motion Plus one. But the component are still mounted in a flat position. On some versions (genuine for instance), it is also possible to cut the button circuit (unused for this project) When a Wii Motion Plus is already connected to a WiiMote, the Nunchuk can be directly connected to the Wii Motion Plus in a "half bypass mode". It also communicates with WMP via a I2C bus. In this mode, the Wii Motion Plus handles the communication and supply sensor values (from gyroscopes and from accelerometers) in an interleaving alternate way. One benefit: the arduino has to handle only one extension, the Wii Motion Plus. It would be possible to retrieve directly data fro a WMP and a NK with the same I2C bus. Because they share the same I2C addresses, it would require some extra PIN to select the wires. Arduino Pro Mini card is a very small version of the well known classic Duemilanove Arduino. However, all possibilities remain the same. It now integrates an Atmel 328p and exists in several versions 3.3V/5V and 8MHz/16MHz. I chose the most convenient and powerful version : 5V / 16MHz There is no more the USB connection for injecting a program, but it's always possible to program it with a small USB-Serial adapter sold separately. This board is the heart of the multicopter. It runs the software and interacts with everything: RC, ESCs, sensors. Note that is is also possible to use other Arduino cards if they include an Atmel 328p running at 16MHz: Arduino nano , Arduino pro, Arduino Duemilanove. Most Arduino clones should also work. In order to support more functionality and have more I/O PINs, MultiWii was ported on Arduino MEGA boards. One of the most interesting compatible board is the Sseeduino Mega. Even if the calculation power is identical to the Arduino Pro Mini, there is nearly no limitation in terms of available I/O PINs with this board. This board also support an integrated USB port. In order to reduce the size and match the standard 5x5cm flight control size (size of Mikrokopter boards), one brilliant man Paul Bake decided to design the Flyduino board. This board is one of the best Arduino mega based board for multicopter thanks to its size, and because the I/O matches the exact needs. size comparison Recently, we can find now fully integrated boards, with FTDI+10DOF+GPS on the same board. Some OSDs are now compatible with MultiWii code and can display artificial horizon based on MultiWii angle calculation + many more features. MIS OSD The following explanations are agnostic to the mode used. So it is relevant for both mode 1 and mode 2, the most commons. The engine launch is done by tilting the yaw stick right while having the throttle stick in minimum position. (An alternative method was also introduced recently: A roll stick or other individual ACC), it is not necessary for the multicopter to be positioned flat, the angle does not matter. Once armed, multiwii should permanently switch ON the status LED. Motor shutdown is done by tilting the yaw stick left while having the throttle stick in minimum position. (An alternative method was also introduced recently: A roll stick left while having the throttle stick in minimum position.) Once disarmed, multiwii should permanently switch OFF the status LED. To calibrate the neutral of gyroscope sensors, you must tilt the yaw stick left, tilt the pitch stick back while having the throttle stick in minimal position. The multicopter should not move during this stage. However its inclination has no influence. The status LED will blink to confirm this step. This step is relevant only if you have a Nunchuk or an individual ACC. The multicopter inclination should be as horizontal as possible during this step. To calibrate the neutral of accelerometer sensors, you must tilt the yaw stick left, tilt the pitch stick back while having the throttle stick in maximal position. This step must be realized at least once, the acc calibration is then stored in the EEPROM. This step can also be realized directly from the GUI via the CALIBRATE button. Note this step is very important and is one of the most common issue we can see in feedbacks, please don't skip it. If this step is not correctly done, the status LED will blink forever and you won't be able to arm the motors (security). The status LED will blink to confirm this step. With the help of your roll and pitch stick you could now trim the ACC mode. You must first put the throttle stick in maximal position. (obviously with motors disarmed) full PITCH forward/backward and full ROLL left/right (2 axis possibilities) will trim the level mode according to the neutral angle you want to change. The status LED will blink to confirm each ticks. What Reference Motor 3x Hobbycity Turnigy 3020 Brushless Outrunner Motor 1200kv - alternative motor 3x Hobbycity Turnigy 2204-14T 19g Outrunner controller 3x Hobbycity Hobbyking SS Series 8-10A ESC - alternative controller 3x Hobbycity Turnigy Plush 10amp 9gram Speed Controller LED 1x Hobbycity Turnigy High Density RC LED Flexible Strip-Green Propeller 3x Hobbycity GWS EP Propeller (DD-7035 178x89mm) Servo 1x Hobbycity Turnigy MG90S Metal Gear Servo 1.8kg Battery 1x Hobbycity Turnigy 1300mAh 3S 25C Lipo Pack We can of course take a different configuration for a larger tricopter. Internet is full of examples. One example of several working setup: Here is a consumption/thrust measurement realized by Joaquin on the current setup: The arduino pro mini, USB interface card and the LCD are available at sparkfun. Wii Motion Plus extensions are widely available on ebay. The RC elements are all available at hobbycity.

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