→ Synthetic Aperture Radar :-

→ The details of how this impressive technology works are a bit beyond this post but the ultimate result is that this sensor or can 'see' through cloud cover, foliage even structure. Since it uses a lot of power, it's currently on large aircraft and satellites and primarily used to do assessment and monitoring of ice caps, earthquakes, resource monitoring, intelligence acquisition etc..,

→ Multi and Hyper spectral

→ Multispectral imaging such as NDVI or Normalised Difference vegetation indexing is used in precision agriculture. These sensors read bands of frequencies reflected off the surface below and crunch that data through software programme. This data provides insights into crop health, land management and hundreds of application out side of agriculture like ecology, oil and gas oceanography and atmospheric studies.

→ Chemical/ Biological "sniffer" sensors :-

Using spectrometer, drones can detect airborne biological information for atmospheric analysis, helping Meterologists Make better forecasts. Through the aid of algorithms, these sensors can also detects abnormalities in the cases of chemical attacks or gas leaks.

→ Released :-

Delivering everything from spraying pesticides to dropping off your Amazon order, releasable payloads are a huge opportunity. Think Hunger Games style distributing supplies or aid to people in need.

However, regulatory bodies are understandably restrictive when it comes to dropping things from aircraft, once safe and reliable systems enable beyond visual line sight flying and clean releases. We can expect to see this side of the industry grow beyond industry grow beyond the current application into areas like aerial pharmacies.

→ RFID scanner:-

providing asset & inventory tracking, airborne RFID scaner will be allows drone to scan areas in repeatable, cost-effective manner. Any things your targ to be simply flying overhea

7. Gps tags:-

similar to RFID scanner, drones can pick up an an follow tagged equipment, people or assets, new technology even allows tracking via camera image, rather than needing to provide a pre-established tag. Although there are limatation, this is a promi a venue for the future.

8. Laser:-[LIDAR]:-

Although there are some extra requirements befor you're allowed to sling a laser around the skies, laser payloads like 'LIDAR' enables surface mapping through foliage, clouds and ground cover.

1. What is "firmware"?

→ Generally speaking, firmware is code programm built into the Micro controller unit [MCU] of Electronic products. After the Micro controller unit is powered up the firmware will control MCU's signals. since the factory will download the firmware to the MCU's flash memory, many people call this process "flashing" In the RC model industry, products such as Escs, receives, digital servos, battery charges and more need firmware in order to operator.

2. What is simnok firmware?

→ simnok firmware is a firmware specifically for Escs, developed by simon Kirby. This firmware has been found to offer faster response compared to normal Esc firmware easy handling and good compactibility all of which greatly enchances Multirotar performance.

*→ simnok firmware is continuously being optimized and upgraded in the beginning only Esc's which used an ATMEL micro controller could be upgraded, through now, the firmware can also be used on SiLabs and intel 8051 MCU's. In additional, the firmware code is open, meaning you can modify the code yourself to better suit your Esc and or application.

3) Simonk Vs BLHeli ?

→ Simonk firmware had issues, when people tried to use them with motors with low kv ratings, but in the most recent versions, this has been eradicated.

→ The BLHeli firmware allows the user to config the settings of the Esc via pc with the user inter BLHeli suite. Generally, the musical tone method of configuring your Esc is just fine, but for a slightly more in depth configuration process, the BLHeli route might be the way to go because of the BLHeli suite.

→ Different types of Esc components:-

→ BEC Esc

BEC stands for Battery Eliminating circuit. In practice, this simply means that Escs, with a BEC are able to output a constant voltage and so power the equipment on body board your plying platform such as your receiver, servos or flight controller.

it entirely depends on which flights controllers you have, but many flight controller now a days do not need to be powered via the Escs. This is because you often have a separate power module with the flight controller which does the job Therefore, you have no need for an Esc with BEC [in relation to powering the flight controller].

However, you may want/need to power other equipment such as servos and receivers and in this case, an Esc with BEC will be necessary

Opto Esc

Escs without BEC are often reffered to as Opto [opeolisation] All this means that the parts of the Esc that receiver the signal from your flight controller or R/C receiver isolated from the higher voltage circuit that powers your motors opto Esc are common on many multirotor setups as your dont always need a BEC as discussed above

UBEC Esc

UBEC stands for universal BEC (DT) sometimes ultimate BEC it's used when Esc doesn't have built-in BEC or stand alone power systems is required. They generally are more different, more realiable and able to provide more current that BEC the UBEC is connected directly to the Main Battery of the multicopter the same way as an Esc

Why use UBEC over Esc BEC?

→ In layman's terms, UBEC has the following advantage over Esc built-in BEC:

1. UBEC are more power efficient
2. BEC needs to over beat with large input/out put voltage difference, or large load; UBEC doesn't have this problem and thus more reliable.
3. UBEC generally can provide more current safely. the reason behind this are due to the way how voltage is regulated. most BEC are linear type and UBEC are switching type

→ If your Esc don't bve BEC, you can use an External UBEC to power your Fc and Rx. The UBEC's in put cable should be connected to the Lipo battery, and the out put cable to the Rx and Fc. No change is required in the Esc connection.

But if you want to power your receiver with an ESC while your ESC's have built in BEC's, those BEC's first needs to be disable/disconnected from your system. simply remove the red wire [5V] from the out put servo lead of the ESC.

→ Linear BEC Vs switching ESC

There are 2 types of BEC:

1) Linear
2) switching. They are basically the 2 types of voltage regulators: linear and switching voltage regulators. which have been covered before, but here is the summary of difference

→ They are sometimes also reffered to as LBEC and SBEC

→ Linear BEC

Most ESC's built-in BEC's are linear type linear BEC reduces the voltage from the main LiPo to 5V by converting the Excess voltage into heat. This is not a very efficient way of voltage converting as you can imagine

→ As input voltage gets higher, or current draw gets larger more power will be wasted and converted into heat. That's why this type of voltage regulator is not ideal for high input/out put voltage difference or high current application. it's generally only used on 3S or below [some works on 4S, but very rarely recommended].

Over heated BEC will enter thermal shut down, and cause loss of power to the flight controller and radio receiver and eventually a crash.

when the main battery pack is fairly low (eg. 7.4V, 2S) wasted power is relatively small because there is not much voltage difference so, efficiency is better. But as you use higher cell count LiPo

efficiency drops right down. lots of power is wasted and converted into heat..

→ this is something you should bear in mind, but I just want to assure you that I have been running 4s on my Blue series Esc [rated 3s to 4s by manufacturer] & using the built-in BEC to power my fc and Rx, I have not had a single problem with it. Although it gets a bit warm, it still runs reliably with good good amount of air-flow. This leads to another argument, where to mount your Esc on quad copter frame!

→ Switching BEC :-

→ switching BEC's reduce the output voltage by switching the supply on and off several-thousand times per second. They don't heat up like linear BEC, and they generally handle higher input voltages and higher current much better.

→ They have a very consistent efficiency across a wide range of input/output voltages, which is around 85%. This is also the choice for running on 4s or above systems if you are after reliability.

→ one drawback with switching regulators is the Noise they produce due to the Nature of voltage regulation. that's why they are not used on Esc's. some people put a LC filter at the out put and it seems to clean up the power pretty well.

Jello effect :-

wobble. This phenomenon [also known as Jello effect] appears when the camera is vibrating, in situations such as hand-held shots at telephoto settings, or when shooting from a moving vehicle. The rolling shutter causes the image to wobble unnaturally.

2) Exposure :-

A photograph's exposure determines how light (or) dark an image will appear when it's been captured by your camera. Believe it or not, this is determined by just three camera settings : apperture, ISO and shutter speed [the exposure triangle].

3) Frame rate :-

Base or project frame rate is the frame rate you camera records to produce 100% realistic speed. The standard is 24 fps for movies, 30 fps for TV/broadcast and for PAL broadcast, it's 25 FPS.

4) Frame per second [fps] :-

is a measure of frame rate, the number of still images that make up one second's worth of video. The more frame per second fps]. the smoother the motion appears.