# Flight Controller //in section 11.3

## Flight Controller General Structure

//Zeug von flo used software sollte hier auch stehen

### Tasks and Timing

All tasks of the XCopter flight controller have to run in a specific hierarchy.  
The used version of the operating system *uC/OS II* has no built-in function, which is precise enough  
to make all tasks periodic in an appropriate way.  
However the *altera nios ii HAL* offers functions to create *periodic alarm timers* sporting a built-in *timer slave* IP-core. By default there is only one *system timer core* available which cannot be controlled by the user. This requires another timer added to the SOPC.  
The currently integrated timer has a timer has a resolution of 1µs.  
Thus it is possible to run all tasks in a deterministic behavior, by releasing a semaphore after a certain period of time has elapsed. The Task itself has to wait for the semaphore to open.  
An example implementation how tasks are made periodic can be seen in below (Figure 1).

// Wie man code in word 2013 einfügt:  
// ”Einfügen” -> “Objekt einfügen” -> Code aus GitHub kopieren und formatieren.  
// Auf Wunsch Rahmen oder schattierung IM OBJEKT texk einschalten. Sonst wird der obere rahmen // nicht angezeit. Den Code kann man dann sogar in dem PDF markieren.



Figure 1 Example code how to make tasks periodic

# Literaturverzeichnis

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| [1] | Altera, „n2sw\_nii52010.pdf “ Available: https://www.altera.co.jp/ja\_JP/pdfs/literature/hb/nios2/n2sw\_nii52010.pdf. |
| [2] | author, title, Ulm: verlag, year. |