1 Final Design

It is time to put everything together. So far you should have implemented all blocks (except *ControlZAxis*) to create a design similar to Fig. 1. In comparison to the exercise sheet 6, the moving average filter (with enable switch) was added to the data path. Furthermore, the command processor from exercise sheet 8 is also included in the final design. If a command is currently processed, due to a button press, the *processing* signal controls the three mulitplexers to disable the manual control from the tilt sensor.

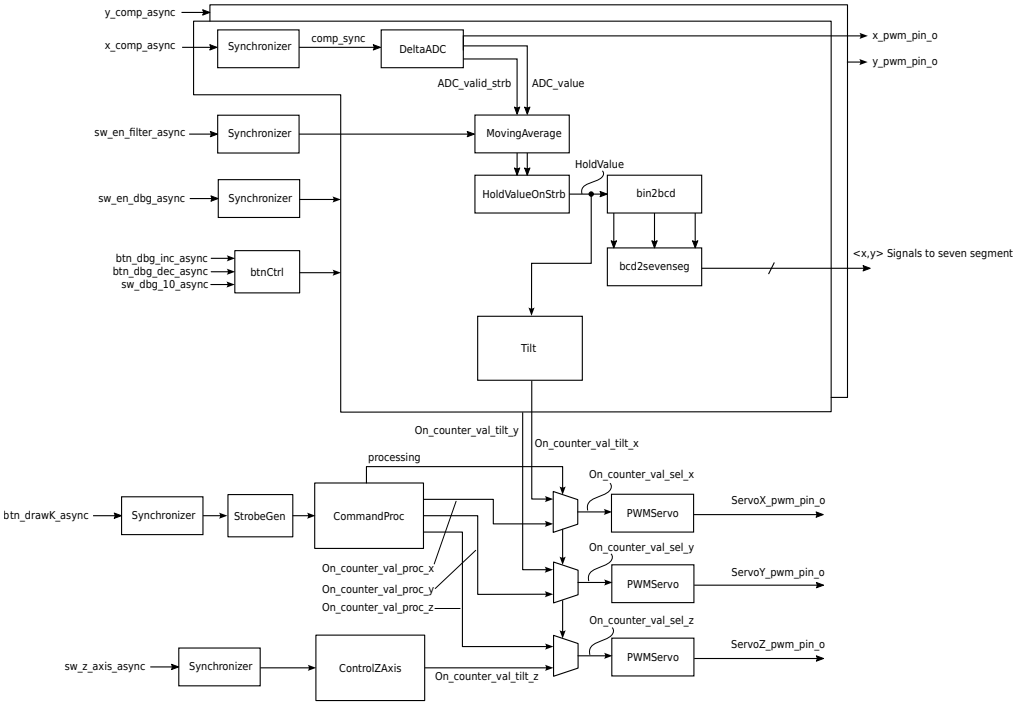

Figure 1: Overview for a single axis of the final design

1.1 To-Do-List

- We want you to take the time and work on finalizing and debugging your design. If you are unsure of some parts in your design, or you already noted strange behavior while debugging, reuse and extend the existing test-benches.
- To finalize the design, we want you to add the following:

  - Add an enable switch for the moving average filter.
  - Add an enable switch for the debug mode from sheet 9. Both modes (normal operation and debug mode) should be implemented into one design! This is not shown in Fig. 1. The module *btnCtrl* should control the debug mode of both the x- and y-axis.
  - Write a simple control unit for the z-axis, which switches the servo between 0° and 180°.
  - Add the required glue logic (multiplexers) to switch between command and tilt mode.

- Keep in mind: For the submission discussion (Abgabegespräch), your design *should work*! In detail, that means:
  - Take your time and test the design on real hardware. If you did not (successfully) test it during the regular lecture time, please contact us. You can swing by and test/debug the designs at our institutes.
  - Know what your design does: You should be able to explain, what your code does and what it is for. Also you should know the switches and buttons used.

2 Hand in Information

Hand in your solution as a single zip file until Feb. 18 for our tutors to check your submission. If you submit it later, there is no guarantee, that it will be evaluated. The documentation should be in one pdf file for all the exercises of the sheet.

Please note: There will be one final upload of your design a few days ahead of for your submission discussion (Abgabegespräch). Please use this sheet to get some final feedback on the state of your design!