9. Trouble Shooting V.14.1

9.1 How to get back into Hybrid Closed Loop

You can go back to bolussing for meals and making carb inputs again at any time just by

- going into AAPS Preferences/OpenAPS SMB/autoISF and switch „Enable ISF adaptation by glucose behaviour“ OFF.

  You might need to re-install your insulin button via AAPS Preferences/Overview/Buttons

- pressing on the **violet Full Closed Loop circle** and select the green Hybrid Closed Loop circle *(easier, if that user interface element is already included).*

  This will automatically bring back your buttons “Insulin, Calculator…” you always had at the bottom of your AAPS HCL main screen

Be aware that now it is again up to you to bolus for meals

It can also be wise, especially in your initial months, to do FCL only for certain meal time slots, and use an **Automation** that shuts down

- either bgAccel_ISF utilization,
- or all of autoISF _ISF modulations („Enable ISF adaptation by glucose behaviour“) for the rest of the 24 hour period.
  In that case, the loop button will automatically adjust its color violet <-> green to show which state your loop operates under *(if that user interface is already included).*.

For instance, it is perfectly possible, without any extra steps involved, to do FCL only for dinners, while breakfast and lunch are done in hybrid closed loop as you are used to.

9.2 Are the pre-conditions for FCL still given?

* Is the basic profile still correct?
* Has the CGM quality deteriorated?
* etc (see section 1 pre-requisites)

9.3 Glucose goes too high

- Meals are not recognized asap
  - Check regarding Bluetooth (in)stability

- Check whether you could set smaller deltas to trigger first SMB
- Experiment with an aperetif, soup a couple of minutes before meal start

- SMBs are too weak
  - Check acceleration detection
  - Check (real-time) in SMB tab what “safety” setting limits allowed SMB size
  - Check (real-time) in SMB tab whether bgAccel_ISF_weight or pp_ISF_weight should be set bigger

- If the tail of insulin activity already pushes you close to a hypo, and you do not find ways to get the sizeable SMBs earlier, you may have to live with the temporary high, or adjust your diet.

  Some users also resort to using a small pre-bolus in their “FCL”. However, this interferes with how glucose curve and hence detection of rises and triggered SMBs behave, and is therefore not easy to implement with convincing overall benefit.

- An important observation by pilot users was, that how your glucose and iob curves approach meal start matters a lot regarding how you peak from carbs:
  Going down (e.g. towards a set EatingSoonTT), building some iob, and curving already towards strong positive acceleration seems very helpful to keep peaks low.

9.4 Glucose goes too low

- **M**eals are falsely recognized
  - Check whether this occurs outside of usual meal times and can be averted by e.g. setting an odd profile target for that time of day.
  - Check whether your bg_Accel_ISF driven first SMBs are too big and lead to too much iob when the bg rise turns out just a temporary bumb.
  - Try to exclude the problematic situation via an Automation that, for a couple of minutes only, sets an odd TT and thus prevents a SMB.
  - To prevent snacks from triggering SMBs as for a meal, use the FCL cockpit for an appropriate temp. setting (low iobTH ;or odd TT for SMBs off; or pre-set “snk” button).

- SMBs deliver overall too much insulin

- Check (real-time) in SMB tab whether SMB range extention or autoISF_MAX should be set smaller
- Check (real-time) in SMB tab which of the autoISF …_weight should be dialled in smaller . Often it will be a too strong dura_ISF. However, that one inheritantly gets stronger with higher and longer lasting highs. Therefore the best remedy is to first try to be more aggressive before, in the glucose rise phase and limit height and duration of the high, then tweak the dura_ISF_weight (downwards).
- SMB delivery ratio probably can be set smaller. Note in this case, it works across the bord for all SMBs (all time slots),

- Problems with insulin “tail” after meals
  - *See 2 bullet points higher up*: dura_ISF tuned too strong?
  - You may need to take a snack (seeing hypo prediction) or glucose tablets (if already in hypo zone). But note that the grams of carbs required that the loop might tell you at some point are very likely exaggerated as the loop has no info *) on your carb intake (while you may be able to guess how much more, incl. from fats and proteins) is still waiting to be absorbed. (*)The loop makes assumptions based on past minutes carb deviations, see reference given in section 4.5)
  - A valueable information would be whether the problem originates mostly in the bg rise phase already. Then setting a lower iobTH might be an easy remedy.
  - If the need for additional carbs happens frequently, note down how many grams were needed (not counting what you eventually took too much which required extra insulin again). Then use your profile IC value to estimate how much insulin *less* the SMBs should have delivered, and go with this info into your tuning (regarding the % profile in the Automations, or maybe also your set iobTH). This may relate to the SMBs given when glucose was high, or also extend regarding the SMBs during the glucose rise.
  - It could well be that you simply have to accept higher glucose peaks for not going low. Or change diet to something with lower amounts of carbs, and higher amount of protein and fats.

9.5 Staying out of Trouble…

In closing this chapter we like to remind everyone that interfering with a closed loop should be kept at a minimum. Also, „optimizing“ parameters for just one specific meal type or other

experience is a **flawed „fine-tuning“ concept** when you are in FCL, and can easy backfire. What we want is settings that get us „good-enough“ through (nearly) all scenarios in our personal everyday lifes.

This is a good time to throw in a reminder, where the real world of T1Ds stands, and the consensus in the medical community, regarding desirable %TIR (or HbA1c, as only a minority would have TIR data).

Weigh for yourself what it is that you try to achieve. For instance, 80%TIR was reached in a study even with a much simpler FCL (AAPS with Automations, Fiasp, no autoISF), and no meal announcements whatsoever.

- **Do the basics right, keep it simple.** Resist the temptation to embark always on the latest craze without knowing how extra features might topple your carefully set balance.

- Learn to use FCL in some times, and not in others that you believe may be too challenging, or you have already a bad experience with (and no time, interest, skill, to resolve it for now. That is fine, too.).

- Stay in touch with the community of developers and other users

- **Relax and enjoy** as/when/while good-enough. „Just eat!“