2. General Settings for Full Closed Loop   V.3.7

Please note that with autoISF you are in an early-dev. environment, where the user interface is **not optimized for safety** of users who stray away from intended ways to use. Good safety features exist, but these are only as good as the development-oriented user understands and implements them. This is not a medical product, refer to disclaimer in section 0

Available related case studies:
Case study 2.1:   (nothing available yet)

When in Hybrid Closed Loop, big boli were given by the user, and the loop had no business to give big ones on top. But this is fundamentally different now.

So, first we must **enable our loop to overcome the narrow safety restrictions for SMB sizes** that were appropriate in HCL.

Evidently, this could become dangerous. Please set your iobTH (section 2.4), and observe all suggestions made in this FCL-e-book *) , and in the github pages of the developers.

See also: https://github.com/ga-zelle/autoISF/blob/A3.2.0.2_ai3.0/How-to-get-larger-SMBs.pdf
                                                              /or newer branch/

*) Caution: This entire e-book is about Full Closed Looping. **In case you intend to work with giving boli**, many suggestions made - notably in this section 2 (and in section 4) – should **not** be followed. You would have to **do extra research**, on your own data, how your bolus changes things. Mainly use the documentations referred to in section 3, then. See also remarks in section 4.1and section 7

2.1 SMB Range Extention
   (preferences/OpenAPS SMB/autoISF settings/smb delivery settings/smb_max_range_extension)

2.1.1 Standard scenario: SMB sizes based on 5 minute loop calculations

Full Closed Looping requires bigger SMB sizes. Setting **120 minutes** of basal as max. SMB size as enabled in AAPS Master is necessary, but will rarely suffice.

In AAPS Preferences/OpenAPS SMB/autoISF settings/smb delivery settings, set SMB/UAM max range extention (**smb_max_range_extension**) to **2.0**. That doubles the allowed max. size, to four hours of your profile basal, *for a start.*

Even better, you could determine an estimate for your initial setting as in the following description, I will use the symbol, ... , to denote where you would use your numbers. My numbers that I use for the same situation will be in parentheses (U).

In full closed loop, once the bg starts rising, you want to get at least half of your required meal bolus within 10 minutes, through 2 SMBs. To do that, you need ..... U (2 U) per SMB on average, and because the bolus sizes tend not to be equal when requested by the Loop, you should have at least ..... U (3 U) as the allowable SMB size. Your hourly basal is around ..... U (0.6 U), i.e. AAPS Master will allow a max. 2 times that hourly basal which = ... U (1.2 U) per SMB. To reach the intended .... U (3 U) therefore you should set your smb_max_range_extention to ....   (2.5 = 3 U / 1.2 U)

The profile helper in section 4.8 might be available for doing this calculation, and for a cross-check.

If you have a *very low hourly basal* rate, extensions *bigger than* 3.0 can result (maximum you can set is 5).

Note: Elevated insulin needs *in phases of elevated insulin resistance* probably will be managed with **>100% profile adjustments**. Then, profile basal gets elevated accordingly, and thus **will automatically allow increased SMB size**.

Watch out (in your SMB tab, or using the emulator, section 10) whether you often run into a limitation by your set smb_max_range_extention. For instance, your **attempts to increase initial SMB** sizes via elevated smb_delivery_ratio (section 2.3) and elevated bgAccel_ISF_weight (section 4.2) **might get cut by a too low smb_max_range_extention.**

The SMBs your loop requests could get reduced in size also by other safety settings, notably by your autoISF_max setting (see section 2.2)

2.1.2 Special Libre 3 (1 minute) scenario with up to 5 SMBs per 5 minutes

When receiving bg values every minute, and adjusting insulin delivery accordingly in smaller steps, probably 120 minutes of basal per SMB suffices.

Watch whether your system actually can process 5 loop calculations (and potentially give 5 SMBs) in 5 minutes. Then judge (similar like shown in section 2.1.1), what maximum SMB size you would like to see.

75 Probably you can leave SMB_range_extension at default **1.0** untouched (but select higher if you have an
76 extremely low profile basal in some of your meal hours, or if your loop "misses" many of the opportunities
77 to make an adjustment, every minute).

78 Integration of 1-minute values is new from autoISF 3.0.1 (May 2024). Please watch your SMB tab (difficult
79 in 1 minute segments => make screenshots, or employ Emulator!), and report experiences / stay in touch
80 with other users.

81

2.2   Max and Min autoISF Ratio
83 (preferences/OpenAPS SMB/autoISF settings/autoISF_min and autoISF_max)

84

85 For a start, set **autoISF_max** = 2.0 . –
86   Your CGM (1 or 5 minute re-calculations) should not matter for this parameter.
87 This allows *up to doubling* of ISF aggressiveness if "requested by the "… _ISF_weights" (see
88 section 4). This is just a first step.
89 You may have to elevate autoISF_max further, later, if your attempts to tune the …ISF_weights
90 (section 4.) often run into a limitation by your set autoISF_max

91

92 For situations of increased insulin sensitivity (less insulin need), you must specify, in your settings
93 (preferences) also what your *lower* limit (for weakening of ISF, compared to profile_ISF) may be.

94

95 **autoISF_min** should be set to 0.3. Again, see whether you ever run into that limit, that your loop
96 e.g. "would like" to act softer, but bounces against that set limit.

97

98   Do not keep autoISF_min at 0.5 or even higher, because that would for instance preclude
99   later, that your exercise setting can strongly "soften" your loop.

100

2.3 SMB Delivery Ratio
102 (preferences/OpenAPS SMB/autoISF settings/smb delivery settings/smb_delivery_ratio)

103

2.3.1 Standard scenario, using 5 minute loop calculations

105

106 Use the *fixed* **smb_delivery_ratio** and increase the setting (from AAPS default 0.5) to 0.6 or 0.7.

107

108   In AAPS Preferences, the smb_delivery_ratio *can* also be set *dynamically* (changing with
109   glucose level). - This seems a feature geared more towards hybrid closed loop applications.
110   (In FCL, we like strong loop aggressiveness at low (but rising) bg, not "wait for" high bg).

So, set your ratio to 0.6 or 0.7 before doing any _weights tuning. Your choice will magnify every SMB, also in phases where you actually want less, so do not exaggerate.

0.6 gets you 20% , 0.7 gets you 40% more insulin 5 minutes earlier, which is a good thing in FCL where you are late with your first meal insulin. But you do not get 20-40 % more really: You gradually will receive the full insulinReq only in increased % increments, 5 -10 minutes earlier.

> The delivery ratio is per se not changing the insulinReq, it just defines what portion gets delivered now vs 5 or 10 minutes later... if the BG trend keeps up...
> In that way, keeping the number closer to 0.5 protects against a jittery CGM mostly.
> As in FCL we have an above-avg CGM quality, we can safely go for 0.6 or 0.7 SMB delivery ratio as kind of our tuning baseline.
> In case you use very strong **smoothing** (e.g. exponential smoothing of incoming CGM values by AAPS) you probably can afford to go more towards 100%. This would make up for probably only some of the "time lost by smoothing" , regarding getting iob up at first signs of bg rising.
> But, the closer you set towards 100%, the more have an eye on how each single bg value AAPS works with triggers SMBs.

The jumpier your CGM, the closer remain near 0.5!

Note that it is generally a flawed strategy, to boost *"across the board"* with things like (*always*) a 100% delivery rate, and then limit problems from it via reducing the *dynamic range* of other highly important parameters (for example, of autoISFmax). While, taken together, these two elements of your flawed strategy would keep you safe, they make your FCL less dynamic, which essentially will translate into giving up a couple of %TIR.

In case you had tuned with a 100% SMB delivery ratio, and now go lower:

I would not expect major re- tuning required, but look into implications for the set iobTH%:

A **100% SMB delivery ratio** made you often **bounce over iobTH in a more "nervous" loop**. You now could fine tune that more sensibly, probably elevate the iobTH even (and maybe also , slightly, the accel weight…which, for safety against your wild 100% setting, had maybe to be lowered before)(Or, If you were unsafe before, leave iobTH where it was, and you are safer now, with a lower SMB delivery ratio)

2.3.2 Special Libre 2 or 3 scenario, when using 1 minute values

The recommendation there is to set the data flow Libre -> Juggluco -> AAPS -> exponential smoothing, and use a **SMB delivery ratio under 50%..**

To understand how the 1-minute values are used

149 • for the (still) 5 minute incremental loop calculations, now done every minute, looking back
150   how the last 5 minutes (evtl. interpolated) went

151 • for the parabola fit based acceleration detection

152 please consult the related section (last chapter) in the developers' Quick Guide:

153 https://github.com/ga-zelle/autoISF/blob/A3.2.0.4_ai3.0.1/autoISF3.0.1_Quick_Guide.pdf

154

155 Also, in this very new application, it is especially important to share experience with other FSL

156 users in Discord -> https://discord.gg/tamvhh57Xs

157
158
159 ## 2.4 Safety Against too Aggressive Settings: iobTH%
160   (preferences/OpenAPS SMB/ autoISF settings/smb delivery settings/iob_threshold_percent
161 …which gets multiplied with preferences/OpenAPS SMB/Maximum total IOB OpenAPS can't go over (U)

162

163 A safety net is needed because autoISF shoots big SMBs when glucose levels begin to rise; but

164 you do not want to bounce into your ultimate maximum total iob (iobMAX) safety setting too often.

165

166   Similarly, this safety net is needed also if using autoISF in Hybrid Closed Loop (HCL), where, after a

167   user bolus already provided some iob, autoISF could add too big SMBs to be safe.

168

169 Therefore, we install an **iob threshold** (iobTH) which, **when**, and as long as, **exceeded, shuts**

170 **SMBs off.**

171

172 Step 1: In Preferences, set the SMB toggle for even /odd targets to "ON"

173

174 autoISF 3.0.1 demands (as we recommend for FCL also for other reasons, see e.g. later in section 5.1.2

175 and 5.1.3) that concurrently, in AAPS / Preferences / Open APS SMB / autoISF settings / SMB delivery

176 settings:

177

178   Enable alternative activation of SMB depending on current target *)   **ON**

179

180   *) *previous autoISF versions* allowed different settings, now it is same setting,
181   for profile target and for TT

182

183

184 Step 2: In Preferences, set your default iobTH_percent

185

186 iobTH is a parameter in AAPS preferences, defined there as fraction of your set maxIOB:

187   /OpenAPS_SMB/autoISF_settings/Full_Loop_settings:

188   Percentage of maxIOB above which SMBs are disabled (iob_threshold_percent,)

189

190   Step 2.1: Solidify your maxIOB

191

192 First, check whether your **maxIOB** is set reasonably in AAPS Preferences / OpenAPS SMB /

193 Maximum total IOB OpenAPS can't go over (U).

- 194   Input a figure (units) slightly above the max level of iob <u>you</u> had ever needed <u>in your past</u> looping
- 195   history (also considering times of elevated insulin resistance you occasionally may have had to deal
- 196   with)*; set maxIOB to that value*.

- 197   If you do not have "old" data at hand: **Max iob** would be the sum of hourly profile basal, plus the max
- 198   meal bolus you might need (g carbs digested in first ~ 2.5 h divided by IC), plus correction bolus for
- 199   elevated value (max seen BG at meal starts minus target BG divided by ISF). Then take the result
- 200   times a factor, e.g. times 1.2 in case you see on some days 20% higher insulin sensitivity, and will
- 201   use 120% profile (switch, or driven by Autosens max, or by other settings, see section 5 and 6,
- 202   later).

203

204

205   Step 2.2: Identify your max iob need in big meals

206

207 Now look at your meal spectrum, and what bolus size, and iob level (including from SMBs; in HCL

208 or FCL) was useful *) in high carb meals to control your glucose. (*For instance, the author needed*

209 *up to 8U early-on in big meals in HCL; and he has TDD near 40 U, and maxIOB set to 10 U).*

210   *) useful level = **iob needed** for the meal; iob may in time have gotten even higher. However, if, in

211   the end, to prevent a hypoglycemia, you had to consume 15 g carbs, then deduct 15 g / (your IC)

212   from that even higher iob **you actually did temp. have**. *Example: 15 g / (10 g/U) = 1.5 U*

213

214

215   Step 2.3: Set your iob_threshold_% in AAPS/Preferences

216

217 Assume you want to approach no more than about 75% of that iob level (that would be useful to

218 have at big high carb meals) via rapid SMB „fire", after a meal related bg rise is seen (*then*, *for*

219 *instance, reduce from 8 U to 6 U*).

220

221 Then calculate your setting for **iob_threshold_percent** in AAPS / Preferences:

222   = desired total iob given via SMBs before bg peaks / iobMAX

223

224 Enter the according percentage in /Preferences

225   (*In the example it would be = 6 U / 10 U = 0.6 ; which means to enter 60 as percentage in*
226   */preferences*).

227

228   In <u>section 4.8</u> a profile helper might be available for more guidance.

229

230 The iobTH then is calculated as follows:

231   **iobTH** = iobTH_percent x maxIOB

232

233

234 Step 2.4: High-carbers may need to reduce their iob_threshold_percent a bit, to factor in that *the*
235 *last "allowed"* SMB can shoot *above* iobTH:

236

237   • The last SMB given **can exceed** that threshold by up to **+30%** of the effective iobTH.

238   This is desirable because it allows higher iob at big high carb meals (where SMB size, when
239   approaching iobTH, is still big); at lower carb meals either iobTH will not be reached anyways, or
240   SMBs are quite small when reaching iobTH and will not shoot over by much.

241   A big SMB that would shoot over by more than +30% will be cut at 130% iobTH.

242   • Until iob falls below effective iobTH, only %TBRs supply more insulin, if the loop calculates
243   that more iob is still required.

244   • In low carb meals, that iobTH level should not be reached => the autoISF parameters
245   („weights") need to be tuned carefully, so SMB sizes are *not always* huge, and bounce
246   against the iobTH restriction, but show different behavior for different meals

247   • Note that when operating with an *even elevated* bg target (>100 mg/dl), iobTH can only be
248   exceeded by **+20%** ("loop at medium power"). This makes sense, notably in an exercise
249   context (…in which *the iobTH per se* also gets automatically lowered, as later discussed in
250   <u>section 6.1.3</u>.).

251

252 Step 2.5: *At some later stage*, come back to fine-adjust your percent setting in /Preferences,,
253 factoring in that it can be auto-modulated.

254

255   • autoISF 3.0 and higher contains a function to **auto-adjust** iobTH **with TT** set: Dynamic
256   iobTH (<u>section 6.1.3</u>). In your initial tuning, just set a iobTH_percent that is good-enough on
257   your average day. A ***low*** (e.g. EatingSoon) TT can automatically ***elevate*** iobTH.

258 • An *elevated* (e.g. exercise) TT can automatically *lower* iobTH, which is highly desirable *for*

259 *exercise.* The formula for the resulting effective iobTH is complicated, especially when the

260 exercise mode is also activated. See sections 3.3 and 6.1.3, and example in case study 6.2

261 • The resulting **effective iobTH** can be seen in the SMB tab.

262 The example on the right shows that iobTH can also get

263 temp. *elevated .* for instance in the case of detected

264 *in*-activity:

265 • From autoISF 3.0.1 onwards, the **SMB tab** starts with

266 the Result section, and right below the / start autoISF

headline, the resulting modulated iobTH is given:

267 *Green texts describe currently not available features that were suggested for*

268 *further development.* In later software updates,

it is desirable to see the modulated number (6.36 U in the example)

269 also next to iob (below the glucose value in the AAPS main screen).

270
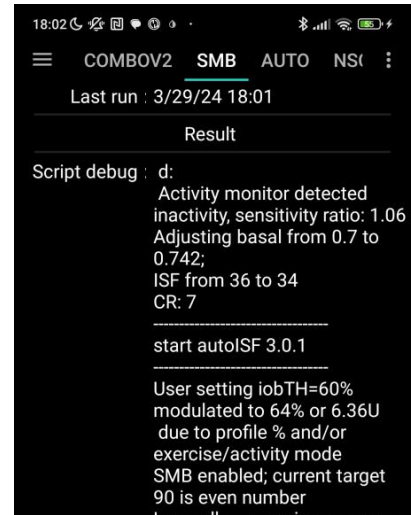
271 • Likewise, a **%profile** setting < 100% (or > 100%) will proportionally lower (or elevate) the

272 iobTH that will be used.

273 **effective iobTH** = % temp.profile x iobTH

274 After the temporary % profile expired, it will automatically revert to your originally set

275 iob_threshiold_percent.

276 *Off-topic* note, regarding the **effective ISF ("sens")**:
277 In the SMB tab, *above the "start autoISF.." line*, the profile ISF is given ("ISF unchanged"), eventually
278 with adaptation by activity monitor ("adjusting …ISF from … to .. " ?) or by a TT ("adjusting …ISF
279 from … to ..") or by a %temp. profile set ("unfortunately" still called "ISF unchanged" then).
280 *Then* follows the autoISF section explaining in detail how the recently encountered bg curve
281 characteristics suggest adaptations, and what overall the conclusion is ("final ISF factor", calculated
282 following the flowcharts as explained in detail in section 03.).
283 *Below the autoISF section*, the effective ISF (sens) results from dividing the (unchanged or adapted)
284 ISF *prior to* "start autoISF", with the determined "final ISF factor" at the end of the autoISF section of
285 the SMB tab.
286 Example given in section 5.4.5

287

288 **If both, a % profile and a TT are set, both effects multiply.**

289

290 We shall see later, how this opens nice avenues for exercise management, where we like to strongly

291 limit how high iob shall be allowed to go. Example given in case study 6.3.

292

293 All above discussed settings must be made in AAPS/preferences

294 - except for the **temporary modulations** of sensitivity, which can be done from the AAPS
295   home screen via %profile or via TT inputs

296 (This will in detail be presented in section 5 or, regarding exercise button, in section 6.1.3).
297 Regarding activity monitor see section 6.6).

298

299 Setting different iobTH via an Automation.

300

301 If you do have situations where you rather use a different iobTH_percent than set in your profile (or
302 than resulting in an eventual auto-modulation), you can change it also via an Automation.
303 Caution: This will overwrite your iob_threshold_percent until you restore it, manually (in
304 /Preferences), or via another Automation (see e.g. section 5.1.4).

305   For this reason, preferably work with the temporary adaptions via %profile, TT and exercise
306   mode as discussed above.

307

308 Next steps:

309

310 **Before going first time into into FCL mode**, you must **first**

311 • check proper AAPS settings according to section 2.6

312 • **make additional settings in** /preferences/Open APS SMB/**autoISF,** when you get to
313   section 4.

314

315 Only after you also went through section 4, you can **enter/exit FCL** (for initial tuning, or for
316 everyday utilization) via

317 • in AAPS/Preferences/OpenAPS SMB/autoISF settings/"**Enable ISF adaptation by
318   glucose behavior**" **ON** / OFF

319   In your multi-week FCL set up phase you will quickly notice that changing this setting back
320   and forth "all the time", in your initial project weeks, is not convenient.

321   A much easier way to "switch off" FCL aggressiveness is to set an odd-numbered bg target,
322   and an even target again when you want normal FCL aggressiveness again. With odd bg
323   targets, you run in "AMA" mode, with autoISF boosted %TBRs but much milder acting
324   because you will not receive any SMBs. See discussion in section 5.1

325 • An improved solution might become in the future available via a User Interface upgrade (described in
326   section 5.3.1): Switching between **FCL** *and HCL* by just tapping on the **violet**/ *green* **closed loop
327   icon** of your AAPS home screen - after this feature becomes integrated in a future autoISF version
328   update.

2.5 EatingSoon TT ?

FCL works in principle also without setting an EatingSoonTT. Try for yourself whether you miss any performance via the totally hands-off way (_and maybe skip this section for now_).

Your FCL works best if you start meals at below-target glucose values, and ideally have a bit of positive iob at meal start. Also, a low temp. glucose target helps making SMBs (that „aim at it") a bit bigger.

Setting an EatingSoonTT well ahead of meal start therefore is _in principle_ a good idea

- If you have relatively fixed meal time slots in the 24 hours of the day, you could set the **target glucose** values **in your profile** accordingly. So _e.g. 11-15h target 76 mg/dl_ if you almost always start a lunch between 11:45 and 14:30h. (_If you do exercise or physical work in that time, this would be too aggressive, and probably also un-necessary_).

- If you have rather irregular habits, it might be worthwhile to **manually** set an **EatingSoonTT** (which is quite time-uncritical) well before the start of a meal, or even (latest) when the first SMB is about to be triggered by your loop. – **Or, just forget about it:**

However, if (as to be expected) your loop anyways always regulates you down to near-target, the effect from setting an EatingSoonTT will be limited:

- If your meals are spaced by a couple of hours your glucose should not be elevated as you approach the next meal …

- If you eat more at a still elevated glucose, your loop should provide you with "a balancing" iob (and hence a prediction to get to target soon) …

…In both cases (which are the prevalent norm) setting an EatingSoonTT would only have a very minor effect.

The good news therefore is: **Setting an EatingSoonTT has only minor effects, if any, and is not required for autoISF FCL.**

Preferred solution with respect to Eating SoonTT

My preferred solution is as follows

365   Principal solution: I am *not* setting an EatingSoonTT ahead of the meal. For getting full loop

366   aggressiveness, an even profile target (or TT) under 100 mg/dl is the only requirement.

367

368   Note: To *prevent* full loop aggressiveness *when not needed*, e.g. at night time, I set an odd profile

369   target (or TT); details see section 5.1.2.

370

371   **Setting odd** (profile or temp.) **target** is generally a recommended easy way for you **to block out**

372   **SMBs**, as an **"emergency brake" for your FCL**. This should be particularly useful in your initial

373   tuning work.

374

375   Refinement: Just "to orient the calculated insulinRequired towards a more aggressive target", I have

376   my loop automatically set a low TT just around the time when it gives first SMBs

377

378   For this you can define an **Automation** like: CONDITIONS: likely meal time of day + 1st sign of a

379   beginning meal + iob under (?) U (to kick in only in initial phase) + no TT running => ACTION: set

380   TT=74 mg/dl for ~30 minutes

381

382   This will **not** immediately influence the first one or two SMBs, which come at acceleration detection

383   *before* a + 10 is seen. Actually this can help "de-couple" treatment of low vs high carb meals:

384   ●   All meals have an acceleration stage in the very beginning, when we already do want SMBs. We

385   should tune bgAccel_ISF_weight (in my suggested mode, without setting a TT) so that all, also low

386   carb meals, get a proper iob boost asap.

387   ●   Only hi carb meals will quickly progress into a +10 mg/dl per 5 minutes rise. The TT kicking

388   automatically in, then, produces two highly relevant benefits:

389   1) the next SMBs (driven still by bgAccel_ISF, or already by pp_ISF) get extra boost, because

390   insulinReq will be oriented towards a much lower target , … and

391   2) the "dynamic iobTH" is automatically elevated, exactly in the time window where it counts. This

392   means, SMBs are shut off later, and on average you get a bit more iob for high carb meals. ((Sorry,

393   this is a bit pre-mature to discuss here. More see section 6.1.3)).

394

395   This Automation can bring a gradual improvement, but will not be essential to have. You could just not

396   worry about EatingSoonTTs and related Automations, and leave eventual implementation of this

397   "refinement" to a later round of fine-tuning things.

398

399   Also, note that this automatic setting of an even TT will mean

400   ●   No other Automations that you might have on bord, and which require "no TT set" as a condition, will

401   be able to run ("is shut out")

- Any random bg jump will, for the duration of this Automation, get you aggressive SMBs. To prevent that you could "tune" the jump size, or set a time window (condition = likely meal time of day) for the Automation. See also the compression low example in Case study 5.3

2.6 Other settings in AAPS/Preferences for autoISF FCL

Make sure you start your migration to FCL with a **solid profile** that worked fairly OK also without a bunch of tricky Automations, and without dynamicISF (which, both, unfortunately, too often are employed to counter-act principle problems with profiles) (or even with technical loop functions, like leaking pods, see section 1).

Indicators for a solid profile in your HCL:

- Not too short DIA for your fast insulin

- Basal keeps your bg steady in open loop testing

- Meal Management in Hybrid Closed Loop is satisfyingly established, and can serve as a blueprint for your FCL set-up.

- Most important: **ISFs** experimentally proven in relevant times of day, and "working fine" also in Hybrid Closed Loop, and allowed **SMB sizes** opened **up to 120 min** basal.

  One frequently observed "burden" loopers bring with them is that they could *not* operate with 120 minute SMB settings in AAPS Master HCL because they did their ISF tuning wrong. Their lower settings on allowed SMB sizes covered up their principal problem, which now is bound to come up and hurt.

See also beginning of section 4.

The following is *not* a list of *all* settings in AAPS / Preferences. We just like to bring up some settings that may not be fully understood, or might interfere "behind your back" with what you try to do.

1. In AAPS Preferences, go all the way down in all sub-pages of: Open APS SMB / autoISF settings/SMB delivery settings: Enable alternative activation of SMB depending on active target: **ON**

   We point to this first, because setting an **odd glucose target** in the top right TT field of your AAPS home screen will be a super convenient **"emergency brake"** for you, in your tuning process, to shield yourself against a FCL "going wild" with more SMBs.

   If you implemented your iobTH (section 2.4) well, that iobTH feature serves as a principle, automated, first line of defense against hyper-aggressive SMB fire from your FCL.

The usefulness of the additional, odd target "emergency brake" will, in the long run, lie more in preventing FCL over-reaction to bg bumps that are unrelated to a major meal (section 5.1).

2. Use Autosens: Should be **OFF**, see the pop-up warning that the feature does not make good sense when entering no carbs. (If for curiosity you want it ON, do so only temporarily and with very narrow Autosens min and max settings, like 0.9 – 1.1).

   Also, do not use Autotune. Enable SMB **always.** (I think for iAPS users we need add: .. and switch off dynamic ISF, dynamic CR, and sigmoid). You may need a look into your CGM whether or how it allows to do SMB always.

3. How frequently SMBs: **3 min**, or for Libre 3 (1 minute): 1 min

4. High TT raises sens: **ON**

5. Low TT lowers sensitivity: **ON**

6. Half basal exercise target: Put in 180 as a placeholder; you will set this later in your initial tuning when you get to tune for your favorite kinds of exercise (section 6.1.3). Lower numbers have stronger effects of reducing basal and weakening ISF for exercise.

7. Activity modifies sensitivity: **OFF** until you get to section 6.6

8. Advanced settings/Always short avg delta: **OFF** (- unless you need it ON because of jittery CGM. Yes, smoothing can reduce problems, but at the cost of losing time for recognizing true bg movements, as well). Same related to your smoothing selection in AAPS **Configuration builder** / Smoothing: **No smoothing** is the preferred solution there if/when/as long as you have an excellent CGM. Next preferred would be Average smoothing. If single values tend to hop around and cause too big SMBs in your case, you may need to try Exponential smoothing, which gives the nicest bg curves but "iron out" the early indication of a rise, which is so important in a no-user-bolus FCL.

   Note re. Libre3 (1 minute): The author has no experience at all with this sensor. Please stay connected with other users to find which recommendations apply. (1 minute CGMs might actually require smoothing; however, there it probably comes with much less of a "time lost" penalty…).

9. Back to /Preferences / Open APS SMB / Advanced setting: For both safety multipliers go **higher**, probably double, the setting as in the dialogue box recommended (for AAPS HCL), so your FCL loop will be able to do up to 500% TBR in the future.

10. autoISF settings: **Do not activate or change settings until you start** section 4.

11. Percentage of maxIOB above which SMBs disabled: Put in the number determined in section 2.4 for your iobTH%. or **50** as a placeholder before you get to that section.

12. Protect settings in AAPS/Preferences with a (short) **password**, just to secure that scrolling through the many settings will never make un-intended changes.

13. Eliminate the buttons at the bottom of the AAPS home screen as soon as you can (in AAPS Preferences/Overview/Buttons: all OFF).

> This can strongly enhance personal safety. (Adult: if temp. losing control of phone; kid: if "playing around" on the phone screen).

> Note: The insulin button would allow to start a dangerous insulin shot.
> PS: Pressing on one of the top three buttons would be much less critical: It might require more inputs (like also a duration) to do anything at all. And it would only tweak insulin sensitivity in whatever the loop will do (if anything) in upcoming 5-minute segments.

14. Analyze, in your data, problems you sometimes encounter, or nearly encountered. Then **define alarms** that make your system safer and better. Sophisticated options for alarms are offered by xDrip, and notably when thinking of Automations (with an alarm as Action) in AAPS.

Next steps

To define a reasonable figure for iobTH% and to make a couple of settings for the SMB delivery settings were your preparatory tuning tasks in this section 2.

We suggest to review the basic description of autoISF by ga-zelle
- https://github.com/ga-zelle/autoISF/blob/A3.2.0.4_ai3.0.1/autoISF3.0.1_Quick_Guide.pdf

- and get oriented, directly there in Github, or via section 3, regarding other support materials available from developers

before activating your autoISF for FCL meal management (section 4).