

## 6. Temporary Modulation for Exercise and lighter (In-)Activity V 2.4

Please note that with autoISF 3.0 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](#)



Exercise management in autoISF builds on the „historic“ exercise mode of OpenAPS, and integrates the iobTH aspect for full closed looping.

### Preliminary remarks

This section is **no easy read** because it attempts to describe *all options* to deal with various types of exercise. Fortunately,

- you might need none of them
- you can set any of them up at your leisure, one at a time, for any of your occasional or regular exercise events
- then pick one or two of the described options, how to go about it.

This is a **toolbox** and, in green, it sketches even *not yet developed tools*, so, unless you are deeply development interested, you can just skip over these **green** passages until a new product version is announced that may include aspects relevant to you.

Looking at related case studies may be easier to digest. –

Please also report *your* experience by supplying a [case study](#).

Staying in contact with the related discord/github community should help greatly to find suitable ways to manage your type(s) of exercise.

## 6.1 Dynamic iobTH and sensitivity ratio in „exercise mode“

iobTH is a threshold you can set, above which AAPS will no longer deliver additional SMBs.

For exercise, we like to limit how high iob can go, therefore automatic “dynamic” reduction of your default iobTH (= iobMAX x iobTH%) is a benefit, notably as you can individually tune it.

Note: When transitioning to autoISF 3.0 from a previous version, de-activate (but keep for a while) the Automations you had for iobTH in previous autoISF versions. autoISF 3.0 totally changes how iobTH is accessed and modulated. (This can affect your automatic meal management, too).

In autoISF 3.0 and later, a default setting for iobTH is made in AAPS preferences, defined there as fraction (e.g. 0.6) of your set maxIOB:

```
/OpenAPS_SMB/autoISF_settings/Full_Loop_settings: iob_threshold_percent,  
=> default iobTH = iobMAX x iob_threshold_percent
```

### 6.1.1 Manual (direct) iobTH modulation

„Manual“ routes to temporarily change iobTH would be

- changing the setting for the new parameter „iob\_threshold\_percent „
- or changing the setting for iobMAX

in /Preferences.

This is not a preferred route for temporary adjustment, because it would not automatically revert to default, after use.

A future improved FCL cockpit (-> [section 5.3](#)) may also give direct access to

- **override iobTH temporarily, at any point of time.**

### 6.1.2 Automations for temporary iobTH modulation

You can define Automations that sets a different iobTH under pre-defined conditions, or for a defined period of minutes to hours.

If your Automation has the User action box clicked, you get a grey button into your AAPS home screen from which you can activate that changed iobTH manually.

Note that this is the iobTH you tell the loop to use in place of the default iobTH

- it will still be modulated further if %profile and TT are set (see below).

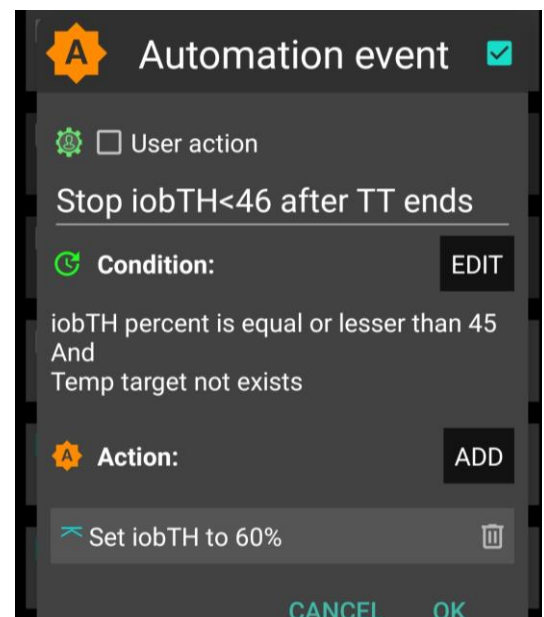
**Caution:** Watch out for a potential stumbling block, because many Automations only work under the condition that no TT is already running.

**Caution:** If (as in autoISF 3.0) setting a different iobTH or bgAccel\_ISF\_weight can not be done temporarily (i.e. with a duration attached) you **must** define a suitable **additional**

must be active in tandem, that **restores the default set iobTH** or bgAccel-ISF\_weight **again**. Else, once your Automation sets in, it will *forever* shift this important parameter setting!

If for instance you have several Automations that, in combination with a set elevated TT also set a lower iobTH: Don't be fooled, the duration only applies to the TT. You need an extra Automation for all of them.

I picked out the highest of the altered iobTH values that these Automations can set (45\_percent), and then I can automatically restore my default desired 60% via this one Automation (see screenshot - - > )



### 6.1.3 Dynamic iobTH: Fully automated iobTH modulation via setting a temp. glucose target

Note that in AAPS preferences, you need to set high TT raises sensitivity = TRUE.

Then, setting a temporary glucose target (TT), modulates iobTH the same way as it modulate sensitivity (ISF). sensitivity).

87 When. *additionally*. the **exercise button** is ON (lit yellow), iobTH gets reduced *particularly*  
88 strong, and ISF *particularly* weakened (as desired for exercise).

89 That effect is the stronger (**ISF gets the weaker, iobTH the lower**), **the lower you set the**  
90 **half-basal exercise target** for your exercise mode in AAPS/preferences/OpenAPS SMB:

91

92 The following table shows, for a profile target of 100 mg/dl, these *particular effects*:

- 93 • @ half\_basal\_exercise\_target you set in AAPS/preferences/OpenAPS SMB
- 94 Choose a low number if you later want a high dynamic range of sensitivity modulation
- 95 • and @ your current exercise TT that you set on the day you do the respective
- 96 exercise, with an eye on how you wish sensitivity auto-adjusted.
- 97 Higher TT = lesser insulin delivered

98 Note that:

- 99 •  $\text{temp. basal} = \text{profile basal} * \text{sens.ratio}$

100 *Example: At a half-basal\_exercise\_target of 120, setting a TT of 120 gives only half*  
101 *(0.5) of profile basal (hence the name of the parameter)*

- 102 •  $\text{temp.ISF} = \text{profile ISF} / \text{sens.ratio}$

- 103 •  $\text{temp.iobTH} = \text{set iobTH} * \text{sens.ratio}$

104 The following table gives some examples for resulting sensitivity ratios.

Half basal ex.target	180	150	120
TT	sens.ratio	sens.ratio	sens.ratio
100	1	1	1
120	0,8	0,71	0,5
140	0,67	0,56	0,33
160	0,57	0,45	0,25
180	0,50	0,38	0,20

105

106 The exact calculation for *any* combination of profile target, set TT, and half-  
107 basal\_exercise\_target is given in [section 3.3](#)

108 You do not really have to deal with these details, though. Just sit back in your cockpit, and  
109 watch the effects of various inputs on iobTH and %sens on your AAPS home screen

110

111 Try to determine good settings for the kinds of exercise that you frequently engage in.

112

113 Later, just press the grey DIY button, or the TT button, and make an exercise-related entry  
114 there ([sections 6.2 or 6.3](#); [case study 6.2](#)). This will automatically switch the exercise button  
115 to yellow (ON), and it lowers basal and iobTH as (in your experience) suitable.

116

117 Note that

118 (1) setting a TT often shuts out other Automations. Choose the duration wisely (and  
119 also the sequence, in which all your Automations are listed).

120 (2) (assuming, you use the even/odd differentiation for SMB on/off:) Consciously  
121 decide whether you set an even or an odd numbered TT.

122 • Pick **odd**, if you do not want SMBs during exercise. (Despite you softened  
123 ISF, SMBs still might „attack“ a sports snack too strongly).

124 However, odd cannot be set too early, when your meal digestion still requires  
125 SMBs. Likewise, you might want the option for a few automatically delivered  
126 SMBs against unforeseen spikes (e.g. from excitement) also later. An  
127 **Automation** that switches from odd to even for a couple of minutes might  
128 sneak in a desired SMB or two .

129 However, you are probably out of luck because an already set odd (or  
130 any) TT would preclude such Automation from kicking in. Then you  
131 need to develop additional ideas, another detour, like to first define an  
132 Automation that briefly shuts your odd TT down.

133 • Working with an **even** TT can sometimes be preferable, notably of course if  
134 your exercise is one that can get you totally excited, with glucose spikes.  
135 While this mode generally does allow SMBs, the loop softens the ISF (by the  
136 sens.factor like in the table given above), and will temp. shut SMBs down,  
137 when **iobTH** (which also got lowered by the sens. factor) is exceeded.

138 Whether odd or even TT is better depends on the kinds of exercise you are doing,  
139 and probably depends on the protein and fat load of your meal and snacks, as well.

140

141 (3) Timing can be critical as to when you do this exercise announcement, especially  
142 relative to a preceding hi-carb meal. Then you want the reduced iobTH in place latest  
143 after you received the first SMB. See [section 6.4](#) and [case study 6.2](#)

144

145 You always can see the valid iobTH your loop is working with in your AAPS home screen,  
146 next to the current iob status.

147

148 You can use any of the above discussed methods, or also the one that now follows in [section](#)  
149 [6.2](#), to further tweak iobTH temporarily, should you see a need.

150

## 151 6.2 Temporary % profile switch

152

153 A complementary measure you can take from the AAPS home screen is to set a **reduced**  
154 **temp.% profile sensitivity**.

155 This setting would **multiply** with the results in above table and further reduce basal and  
156 iobTH (whenever exercise button AND profile button both are yellow).

157 Temp. reduction of basal will proportionally also reduce the *max. allowed* size of SMBs  
158 (which is two hours worth of basal x SMB\_range\_extention, see [section 2.1](#))

159 Note that the **time windows** for doing this profile switch (which was the main ingredient of  
160 going into exercise in hybrid closed loop) can differ from your TT-related exercise settings.  
161 Using all available tools then allows a nearly surgical approach to what you want to achieve  
162 for and during your favorite exercise(s).

163 • Often the %profile modulation is used for several hours if not days to  
164 accommodate “long waved” sensitivity swings (See e.g. in [case study 6.2](#)).

165 • Instead, or even additionally, the percentage might be modified for just a  
166 couple of minutes, or for one special snack or meal duration, to “nudge” the  
167 proportionally modulated aggressiveness of the FCL (see [section 5.2.3](#)).

168 You can prepare yourself for anything you see coming up, or potentially coming up, in your  
169 daily life, so, from the comfort of your cockpit you get ready for it within just a second or two,  
170 doing a few „clicks“.

171

## 172 6.3 Managing exercise via Cockpit inputs

173

### 174 6.3.1 Basic Settings for Exercise

175

176 Coming from FCL with no TT set (both top fields, TT and exercise, are grey), you best  
177 prepare for an intended exercise by **pressing the TT field** of your AAPS main screen (your  
178 looping cockpit; presented in [section 5.2](#)).

179

180 There, you can **freely select** TT and duration.

181

182 Alternatively, you can press on **one of 4 offered exercise presets**. (Note: This, and many  
183 other – in this green color - described cockpit features are yet to be developed)

184

185 When you do either one, the exercise button in the top middle of your AAPS main screen will  
186 turn yellow: (It also does turn yellow, or remains yellow, whenever you **make a new selection**  
187 **or input in these fields (or when you** just press on the exercise button, when a TT is set.)

188

### 189 6.3.2 „Dynamic“ exercise mode off = traditional AAPS exercise mode (YGY)

190

191 When the dynamic exercise mode is off, you still have the instruments for *exercise*  
192 *management just as you always had it in the past* = a combination of manually softened  
193 aggressiveness via setting a temp. %profile change, and orienting corrections towards an  
194 elevated TT.

195

196 By selecting an odd numbered TT you now have the *additional option* to shut SMBs  
197 temporarily off, too.

198

199 If improved cockpit is launched, the top part of the dialogue box looks about like this when  
 200 the exercise field is grey:

activity	TT	dura	%profile	iobTH	bgAccel	%overall
n/a	171	180	70	3.0 U	0.24	70

Mode set to run for 134 more minutes

201

202

203 % profile can be changed:

- 204
- either here => neighboring %profile button turns yellow too (with the % info on it); or
  - under the %profile button; or
  - it had already been changed using AAPS / Action / Profile switch

207 In all 3 cases, you see the number < 100 or >100 in the middle of above table, on a yellow  
 208 colored field, too.

209 In this “YGY” mode, the % temp. set profile is the effectively applied “%overall” sensitivity

210

211 TT and duration can be entered or changed (= traditional mode to set exercise targets).

212

213 If there is a desire to try, for the **remaining duration**, a different iobTH or bgAccel\_ISF-  
 214 weight, this can be overridden in the table; field turns yellow, and the algorithm uses temp.  
 215 iobTH and/or temp bgAccel\_ISF\_weight as modified in the exercise button (and reports this  
 216 also in the SMB tab).

217 In the dialogue box pictured above, 70% profile was set for 3 hours, and the default  
 218 iobTH of 60% \* 10 U was cut by 50% down to 3.0 U.

219

220 The effective iobTH shows also in the AAPS home screen, next to the actual iob (e.g. „1.2 U  
 221 < 3.0 U“)

222 The remaining duration shows below the table (in the example: 134 minutes and counting  
 223 down).

224



225 TT and % profile will also show on the yellow labels of the neighboring %profile (left top of  
226 AAPS home screen) and TT (right side), respectively.

227

228 The middle (exercise) field remains grey because the automatic sensitivity tuning (that would  
229 use TT and half-basal exercise target) are off.

230

### 231 6.3.3 Dynamic exercise mode ON (GYG or YYY)

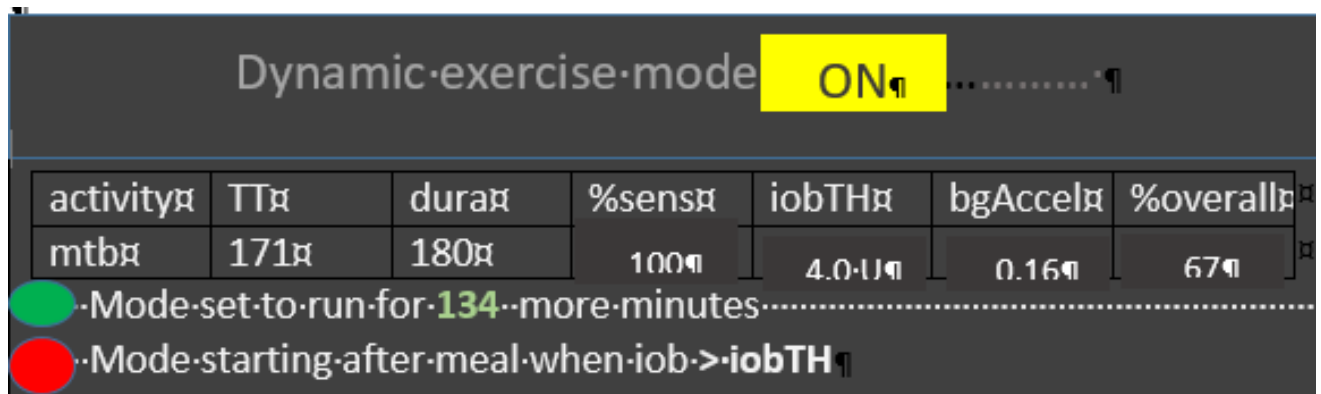
232

233 By pressing the yellow exercise button on the AAPS home screen, *you have the*  
234 *option* to switch the **dynamic exercise mode ON**, in which case the middle  
235 field/exercise button of your AAPS main screen will go from grey to yellow.

236

237 In a version update you could do your setting for the upcoming exercise under the **dialogue**  
238 **box of the TT button**

239 Then, when you look into the exercise button in the middle of your FCL cockpit the dynamic  
240 exercise mode will automatically be „ON“, and all entries made:



Dynamic exercise mode <b>ON</b>						
activity	TT	dura	%sens	iobTH	bgAccel	%overall
mtb	171	180	100	4.0-11	0.16	67

• Mode set to run for 134 more minutes

• Mode starting after meal when iob > iobTH

241

242 The data for the kind of exercise (*here mtb; could also be n/a or ?*) are coming from prior  
243 selections made in the dialogue box of the neighboring TT field. There, as well as in this  
244 window here, the resulting iobTH and bgAccel\_ISF\_weight are shown. Also the overall  
245 aggressiveness (% overall insulin sensitivity factor) is calculated.

246 The **middle field** of the table in this dialogue box, **% profile** either picks up the % set under  
247 the %profile button, or an input can be made here, in the exercise button domain, which will:

- turn the neighboring %profile button on yellow and show that inputted % on it, too
- be multiplied with the result from the exercise mode settings per se, and change the % overall, accordingly.

So, if this middle field of above table (dialogue box of exercise button) contains a figure other than 100, the input field becomes yellow, and you are operating with a combination of traditional PLUS new exercise mode (with all three top buttons of your FCL cockpit yellow). This maximally will soften aggressiveness, for which you get an idea by the last calculated figure.

The mode is either running already (*for another 134 of the total 180 minute in the picture*) as also the label on the neighboring yellow TT field will show *171 (134, and counting down)*, Or (*see at the red dot in picture above*), it is scheduled to run, after insulination for a started meal surpasses iobTH (*as in table*).

Note that, when the TT expires or is changed, your overriding input (if you made any) is automatically erased, forgotten.

#### 6.3.4 Dynamic exercise mode ON plus %profile change (YYY)

The **middle field** of the table in the dynamic exercise mode dialogue box (see above), **% profile**“ either picks up the % set under the %profile button, or an input can be made here, in the exercise button domain, which will:

- turn the neighboring %profile button on yellow and show that inputted % on it, too
- be multiplied with the result from the exercise mode settings per se, and change the % overall, accordingly.

So, if this middle field of above table (dialogue box of exercise button) contains a figure other than 100, input field becomes yellow, and you are operating with a combination of traditional plus new exercise mode (with all three top buttons of your FCL cockpit yellow). This maximally will soften aggressiveness, for which you get an idea by the last calculated figure.

277 It is advisable to find good settings within the dynamic exercise mode and NOT use profile  
278 switches on top – unless the profile switch is meant, also outside of the temporary exercise  
279 context, to provide for other, „longer waved“, health or hormonal situations.

280

281 Also, that middle field offers easy access for temporarily tweaking the aggressiveness  
282 without immediately changing core settings like the half-basal-exercise target etc.

283

284 6.4 Option to pre-set for 4 kinds of exercise or meals (for 1 button operation)

285

286 6.4.1 iob\_threshold\_percent

287 In AAPS preferences/OpenAPS SMB/autoISF settings / Full Loop Settings, the default  
288 iob\_threshold\_percent used for the normal meal spectrum is defined.

289 In an updated later autoISF version you might be able to differentiate there for up to 4 meal  
290 clusters (see next section)

291

292 6.4.2 Pre-settings for (up to) 4 kinds of exercise:

293

294 In AAPS preferences/OpenAPS SMB/autoISF settings / Full Loop Settings: follows next input  
295 fields for pre-settings you can define for (up to) 4 kinds of exercise:

296 The following table gives an example of settings you may find well-suited for 4 of your  
297 favourite exercises

#1-4	give name (max 3 characters)	duration for TT ( min)	TT (AC) (mg/dl)	% profile	iobTH	bgAcce:weight	Approx % ins reduct.
1	wlk	60	111	100			
2	grd	120	131	90			
3	bik	300	151	90			
4	mtb	180	171	70			

298 Input fields (during tuning phase to determine good settings) are only the columns 2-5.  
 299 The last 3 columns will be calculated from TT and %profile inputs, using also the half-basal  
 300 exercise target and the default weight setting. In this setting.  
 301 The last is only an approximation to get a feel for a reasonable setting of the other  
 302 parameters. Here in preferences they  
 303 should never be overridden, but TT or % profile should be adjusted to reach desired result  
 304 when tuning for FCL.

305 Likewise, you find tables to make pre-settings for meals and for hypo treatments:

306

#### 307 6.4.3 Pre-settings for (up to) 4 kinds of meals:

308

309 In AAPS preferences/OpenAPS SMB/autoISF settings / **Full Loop Settings**: follows next:

310 Input fields for pre-settings you can define for (up to) 4 kinds of meals. For instance:

TT# 1-4	give name (3 letters)	TT (Eating Soon) (mg/dl)e	Duration for TT (min)	iobTH (0---130% and < iobMAX)	bgAcce factor 200...0%	
1	hiC	72	120	110	110	
2	loC	74	180	67	67	
3	piz	76	300	100	100	
4	snk	78	60	100	50	

311

312 Input fields (during tuning phase to determine good settings) are all columns

313 Difference in TT is fairly unimportant (unless you do not give a name and memorize the set  
 314 TT number instead, for which meal type it codes.

315 Logic why not having a % profile column here: %profile switch should be set extra,  
 316 potentially for another time period (e.g. „reserved“ for periods of exercise, or for entire  
 317 days of altered insulin sensitivity, for instance due to illness, fasting, extensive sports  
 318 week.)

319

320

321 6.4.4 Pre-settings for (up to) 4 kinds of Hypo treatment:

322

323 In AAPS preferences/OpenAPS SMB/autoISF settings / **Full Loop Settings**: follows next:

324 Input fields for pre-settings you can define for (up to) 4 kinds of HYPO treatment. Example:

TT (ES) (mg/dl)	give name (3 letters)	TT (AC) (mg/dl)	Duration for TT (AC) (min)	bgTH (mg/dl)	
1	Hy1	131	55	none	
2	Hy2	131	55	200	

325

326 Input fields (during tuning phase to determine good settings) are all columns, 2-5.

327 Choosing an odd-numbered TT is recommended as it can shut-out SMBs (with the

328 appropriate setting in preferences/Open APS SMB/autoISF settings/smb\_delivery

329 settings/"enable alternative activation...".

330

331 Those of us who tend to over-treat hypos may prefer to set Hy2 (unless for night snacks->

332 Hy1): Reverting to standard loop aggressiveness with SMBs after/if a certain bg level

333 („threshold“, similar to our iobTH for meals) is surpassed, and we want our loop to react

334 again with SMBs before the set duration expires.

335

336

## 337 6.5 Mastering Exercise after a Meal

338

339 In Hybrid Closed Loop, we gave less insulin at meals (a reduced bolus) before exercise.

340 Since we now get our meal insulin automatically from the loop, we would have to at least  
341 somehow tell it that exercise follows this time.

342 Simply setting an exercise profile *before* the meal would make our full closed loop too weak  
343 in the "treatment" of the first glucose rise. What we want is, to get our (already, compared to  
344 HCL, delayed) meal insulin delivered as fast as possible by SMBs. It just should be capped  
345 at the desired iob reduction.

346

### 347 6.5.1 Manual mode requires 2 user interventions

348

349 What we can do, is (1) **reduce** the **iobTH** (e.g. by one third).

350 • In the example we were using, this would mean to reduce by 2 U to  $iobTH^* = 4U$ .

351 • Do that estimate for your data, and think back how you did bolus reduction in hybrid  
352 closed loop before same exercise.

353 • Likewise, you can use your profile ISF, e.g. 30 mg/dl/U and „translate“ by how much  
354 (  $2U * 30 \text{ mg/dl/U} = 60 \text{ mg/dl}$ ) this „pulls you away from going into a hypo“.

355 • Using your IC (e.g. 8g/U) you can also translate the iobTH reduction (2 U) into a  
356 „snack equivalent“ ( $2U * 8 \text{ g/U} = 16 \text{ g}$ ) that you „replace“ by thinking ahead and  
357 „budgeting“ for some exercise with your iobTH modulation.

358 In this senario, our loop delivers SMB insulin as fast as always, only that when the last SMB  
359 has passed the iobTH, the loop only has elevated %TBR to work with, meaning it cannot  
360 raise iob by much any longer. This provides an elevated glucose level on which we enter  
361 exercise, and saves us hypo danger or snack need (as calculated in above examples).

362

363 After this reduced iobTH is reached, step (2) must follow = an increased exercise **bg target**  
364 is set (see [section 6.2](#)).

365

366 The problem with this approach is that it requires **two** user interventions, first **setting the**  
367 **lower iobTH**, later (**and this *in a time-critical manner***, after iobTH is exceeded), to **input a**  
368 **exercise TT** or activate a related setting.

369 To eliminate this problem, the following refined solutions are suggested:

370

#### 371 6.5.2 DIY cockpit: Using pre-set meal / exercise settings from a User action Automation

372

373 The „DIY cockpit“ user interface allows a *one-step* setting for meal + exercise that can be  
374 selected in time-uncritical fashion, any time before the meal starts.

375

376 Summary from detailed example given in [case study 6.2](#):

377

378 A sequence of 3 Automations must be set up, of which only the first one must be manually  
379 triggered, in just one time-uncritical key stroke from the AAPS home screen.

380 The others come on automatically when the respective Conditions are met.

381

382 Automation #1 provides, for a meal that precedes exercise, the full loop aggressiveness, but  
383 makes sure that this aggressiveness stops immediately after a (reduced) iobTH is exceeded.  
384 The reduced iobTH ensures that not too much insulin is on board for exercise after the meal.  
385 Also it provides an elevated bg level at (re-)start of exercise.

386

387 In this Automation, the box “User action” should be permanently ticked. This will  
388 automatically provide a grey button on the bottom of the AAPS home screen (“DIY cockpit”)  
389 that can be freely named (= headline of Automation #1).

390

391 When the reduced iobTH is exceeded, two things need to be provided :

392 (1) a milder running FCL (reduced exercise %profile, after the meal rise had been  
393 managed based on 100% profile boosted further by bgAccel\_ISF driven full  
394 loop aggressiveness) => Automation #2 sets e.g. 70% profile and ends TT

395 (2) setting an exercise TT (not possible with Automation #2. But *after* it ended the  
396 TT, an Automation #3 can immediately follow and set the desired exercise  
397 TT=125 (which implies the exercise mode

398 Note that Automations 2 and 3 are fully automatic, no User action is involved. See [case](#)  
399 [study 6.2](#) for an example

400

401 Should during the exercise a need arise to modulate the loop aggressiveness (iobTH,  
402 effective ISF) that can be done within 1-2 seconds also right from the AAPS home screen  
403 („FCL cockpit“) by setting a higher or lower temp. %profile, and/or by setting a higher or  
404 lower temp. exerciseTT.

405 To make the loop temporarily act a bit more aggressive, switching the exercise button OFF  
406 (from yellow to grey) could also be considered

407

408 [Defining User action - Automations to build your FCL cockpit](#)

409

410 If you want to develop your **DIY User Interface**, make sure you define suitable settings that  
411 reflect **your** personal insulin sensitivity and data patterns.

412

413 As mentioned in other places, Automations can be tricky as to whether they actually will ever  
414 work, because the loop goes through the exact **sequence of all your active Automations**,  
415 and might be switched into a direction that no longer is compatible with the conditions that  
416 must be a given, for the Automation you think that should kick in.

417

418 To have a clean AAPS home screen (and also to prevent unnecessary accidental  
419 activation), define reasonable time windows for each of your shelved special routines, or  
420 keep them entirely dormant (de-activated) in the list of all your Automations, and activate  
421 them only for the day when you think you might need them

422

423

424



425

426 6.5.3 Improved cockpit: Using pre-set meal / exercise combination from TT dialogue box

427

428 The improved „FCL cockpit“ User Interface (when available) also allows a one-step setting  
429 for meal + exercise that can be selected in time-uncritical fashion, any time before the meal  
430 starts.

431 It manages the meal with an appropriately reduced iobTH, and is programmed to  
432 automatically activate the exercise settings when iobTH is exceeded:

433

434 If in addition to meal, one of the 4 pre-programmed exercises is also selected from the  
435 bottom of the TT dialogue box, (for example, in case of biking after a hi carb lunch, hiC + bik,  
436 see section 5.3.3.1.) then meal gets superseded /overridden with condition „duration = until  
437 when iobTH is first time exceeded“. Plus, that is the other important point, the activity-related  
438 reduced iobTH is taken over for the meal, too.

439

440 All this happens from the AAPS home screen and associated dialogue box from the TT field  
441 there.

442 Actual valid settings can at any time point be seen in the AAPS home screen (see section  
443 5.3.3.1 on extra data fields, above).

444

445 When your FCL is in this meal + exercise mode, you first see at the TT field (section 5.3.3.1)  
446 of your AAPS main screen:



... and when iobTH is the first time exceeded, this automatically switches to:



447

448

449 That 1-step setting can either be freely done according to [section 6.2](#)

450 Or you can just press one of your frequent meal and frequent exercise „codes“, as described  
451 in [sections 6.3.2 and 6.3.3](#)

452 *Example: For mountain biking after pizza lunch* press two buttons, *piz* and *mtb*, in the  
453 dialogue box of your AAPS home screen's TT field. That's all (...after, one time, you figured  
454 out what settings suit that scenario, and you put it into /preferences, see [sections 6.3.2 and](#)  
455 [6.3.3](#)).

456

457 6.5.4 Laissez-faire alternative

458

459 You could also just use an exercise setting and accept a reduced loop aggressiveness  
460 already before meal start. You would go a bit higher in your glucose peak. As, in principle, a  
461 higher glucose level is desirable for starting exercise, this can be a viable route, too.

462

463 This depends on your meal's carb load also, and should be viable if you do the often  
464 recommended protein-rich meal before exercise.

465

466 Note that making the exercise setting after meal start is problematic in case the first  
467 SMBs already exceeded the iob you see as limit for starting your exercise (which is  
468 not the limit for the meal *per se*).

469

470

471

## 472 6.6 Activity Monitor

473

474 An optional feature for times without serious exercise, but still suspected **effects on insulin**  
475 **sensitivity (max +20% to minus 30%)** is the **activity monitor**.

476

477 It can be generally activated under /preferences/OpenAPS SMB/Activity modifies sensitivity)

478 If the user

479 • has scaling factors set there (in preferences/OpenAPS SMB/Activity modifies  
480 sensitivity)

481 • has **no TT running**

482 • (and, regarding nighttime: did not opt for „ignore\_inactivity\_overnight“)

483 then AAPS automatically modulates for sensitivity changes **based on movement intensity**

484 for the last minutes to 1 hour time frame.

485

486 **Personalized tuning of the two scaling factors** is necessary in your FCL set-up phase. For  
487 details see [section 3.4.](#)

488

489 The Activity Monitor can also be used (overridden/ used for tuning the scaling factors) from a  
490 dialogue box (*if already launched*) coming up from the exercise button (top middle of AAPS  
491 home screen).

492

493 **Note that Activity Monitor only works if no exercise (or other) TT is active** (which would  
494 influence insulin sensitivity ratio much stronger than the tweeking done by the Activity  
495 Monitor, for slighter everyday effects).

496

497 In this dialogue box (connected *in a future update* with the exercise button), the two scaling  
498 parameters (set as default by the user during initial set-up in preferences) are displayed, and  
499 can be temp. over written. (These settings will expire and revert to default as set in  
500 /preferences, whenever the Activity Monitor closes (goes auto-off, or is pushed off)).



501

502

503 The resulting sensitivity effect is the roughly expected effect of requiring >100% insulin if  
504 moving around a bit (activity), or needing a lesser %age when being very stationary.

505 It is displayed in the right side column of the dialogue box (*if already launched*) to give the  
506 user a feeling for the expected effects from her/his „weight“ inputs.

507

508 The exact impact is calculated by the loop and shown on top of the autoISF results in the  
509 SMB tab (every 5 minutes).

510