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4 **0. Introduction**

5 **1. Pre-requisites for Full Closed Loop**

- 6 1.1 Well tuned hybrid closed loop  
7 1.2 Fast insulin  
8 1.3 Reliable insulin delivery from pump and cannula  
9 1.4 Excellent CGM  
10 1.5 Meal-related limitations?  
11 1.6 Lifestyle-related limitations?  
12 1.7 Time required for setting-up  
13 Case study 1.1: Occlusion  
14 Case study 1.2: Comparing insulins for FCL  
15 Case study 1.3: Jumpy CGM  
16 Case study 1.4: Lost pump connection  
17 Case study 1.5: Permanent CGM values w/ 2x G6

18 **2. General Settings for Full Closed Loop**

- 19 2.1 SMB range extension  
20 2.2 Max and min autoISF ratio  
21 2.3 SMB delivery ratio  
22 2.4 iobTH (iob\_threshold\_percent)  
23 2.5 Eating Soon TT?  
24 2.6 General settings in AAPS/Preferences

25 **3. Description of autoISF / guidance by developers**

- 26 3.1 Overview  
27 3.2 ISF modulation flowcharts  
28 3.3 Exercise mode and dynamic iobTH  
29 3.4 Automation options with autoISF parameters  
30 3.5 Activity monitor  
31 3.6 Using one-minute CGM (Libre 3)  
32 3.7 AutoISF parameters overview table  
33 3.8 Emulator for logfile analysis and tuning  
34 3.9 Links to related case studies/detailed doc.s

35 **4. Meals: Setting ISF\_weights in AAPS/Preferences**

- 36 4.1 Getting started  
37 4.2 bgAccel\_ISF\_weight  
38 4.3 pp\_ISF\_weight  
39 4.4 bgBrake\_ISF\_weight  
40 4.5 dura\_ISF\_weight  
41 4.6 Tuning your initial settings  
42 4.7 Complex scenarios  
43 4.8 Profile helper  
44 Case study 4.1: Pizza  
45 Case study 4.2: Low carb meals  
46 Case study 4.3: Hands-off FCL around Christmas

47 **5. Temp. modulation of autoISF aggressiveness**

48 **5.1 Automatic modulation of loop aggressiveness**

- 49 5.1.1 autoISF off outside of meal windows  
50 5.1.2 SMB off @ odd profile target  
51 5.1.3 SMB off @ odd temp. target  
52 5.1.4 Automatic diff. of FCL aggressiveness via Automations  
53 5.1.5 Automatic diff. of FCL aggressiveness via Activity Monitor  
54 5.1.6 Pro/con completely hands-off FCL

55 **5.2 Manual modulation of FCL aggressiveness via DIY cockpit**

- 56 5.2.1 Status recognition  
57 5.2.2 Manual interventions from DIY cockpit

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= Drafted fragments or  
not implemented ideas.  
Please contribute, or wait for  
update with the missing info

- 5.2.2.1 Temp. %profile or TT settings
- 5.2.2.2 Temp. settings in /preferences
- 5.2.2.3 Grey DIY cockpit buttons for pre-programmed FCL responses
- 5.2.3 Temporary exit from FCL

#### 5.4 Recognizing loop state from the AAPS home screen

- 5.4.1 Color scheme (grey/yellow) of the top 3 fields (profile, exercise, TT)
- 5.4.2 Info on the top 3 fields (profile, exercise, TT)
- 5.4.3 FCL related indicator fields
- 5.4.4 Overall AAPS home screen

#### 5.4 Ideas for an improved cockpit

- 5.3.1 Violet FCL icon and underlying buttons
- 5.3.2 Bottom buttons "insulin" etc.
- 5.3.3 Top three fields
  - 5.3.3.1 TT dialogue field
  - 5.3.3.2 Exercise button / dialogue field
  - 5.3.3.3 Profile dialogue field

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= Drafted fragments or not implemented ideas.  
(Might be weeded out soon, many things not really needed)

Case study 5.2: Sweet snacks / Glühwein w/ DIY cockpit

Case study 5.3: Compression low

### 6. Temp. modulation for exercise and light (In-)activity

#### 6.1 Dynamic iobTH and sensitivity ratio

- 6.1.1 Manual (direct) iobTH modulation
- 6.1.2 Automations for iobTH modulation
- 6.1.3 Dynamic iobTH

#### 6.2 Temp. % profile switch

#### 6.3 DIY cockpit based on User action Automations

#### 6.4 Improved FCL cockpit

- 6.4.1 Manual (direct) iobTH modulation
- 6.4.2 pre-set 4 kinds of exercise
- 6.4.3 optional meal pre-sets
- 6.4.4 optional hypo management pre-sets

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= Drafted fragments or not implemented ideas.  
(Might be weeded out soon, many things not really needed)

#### 6.5 Mastering the exercise after meal challenge

- 6.5.1 Manual mode
- 6.5.2 DIY cockpit button for User action Automation
- 6.5.3 Using pre-sets in improved FCL cockpit

#### 6.6 Activity monitor based on step-counter

Case study 6.2 Biking day with hi carb lunch; DIY cockpit

### 7. Advanced HCL (meal announcement via pre-bolus)

- 7.1 Hurdles for FCL
- 7.2 Getting ready to advance from HCL
- 7.3 Reduced pre-bolus
- 7.4 Tuning autoISF in HCL
- 7.5 Dealing with disturbances/ins. sens/resistance
- 7.6 Exercise management
- 7.7 Remote control (small children) (fragment, to be completed NN)
- 7.8 Other methods w/ meal announcement (MA)

### 8. Performance monitoring and tuning

Case study 8.2: Futility of tuning based on 1 extreme meal

### 9. Trouble shooting

### 10. Emulator on PC to determine settings

- 10.1 Installing the Emulator on your PC
- 10.2 Analyzing loop decisions in logfiles
- 10.3 What-if analysis

### 11. Emulator on the smartphone

- 11.1 Installing the emulator on your smartphone
- 11.2 Checking loop decisions on the smartphone
- 11.3 Options available on i-Phone (for Trio or iAPS)

114	11.4 Real-time checking a „what-if“ question using speech synthesis
115	<b>12. Remarks for users of previous autoISF version</b>
116	<b>13. Other avenues to Full Closed Loop</b>
117	13.1 FCL using AAPS Master and Automations
118	<a href="#">Case study 13.1: Comparison 1 mo FCL Automation vs autoISF</a>
119	13.2 dynamicISF used for Full Closed Loop
120	<a href="#">Case study 13.2: Using dynISF for FCL ( NN )</a>
121	13.3 Methods involving simple meal announcement that might be stretched into a FCL
122	13.3.1 Boost
123	<a href="#">Case study 13.3: Boost-based FCL for a child</a>
124	13.3.2 AIMI,
125	13.3.3 EatingNow
126	13.3.4 Tsunami
127	13.4 No-bolus looping with precise carb Inputs
128	13.5 Machine Learning (AI)
129	13.6 Dual hormone systems