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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

Skip what is in green writing:
= 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

5.3 Recognizing loop state from the AAPS home screen

- 5.3.1 Modulated loop aggressiveness (3 top buttons)
- 5.3.2 Color scheme of the top 3 buttons
- 5.3.3 Info on the top 3 buttons (profile, exercise, TT)
- 5.3.4 FCL related indicator fields
- 5.3.5 Overall AAPS home screen
- 5.3.6 Info given every 5 minutes in the SMB tab
- 5.3.7 Info about last 15 autoISF decisions
- 5.3.8 SMB tab info when operating 1-minute Libre
- 5.3.9 Summary: Your personal FCL cockpit

5.4 Ideas for an improved cockpit

- 5.4.1 Violet FCL icon and underlying buttons
- 5.4.2 Bottom buttons “insulin” etc.
- 5.4.3 Top three fields
 - 5.4.3.1 TT dialogue field
 - 5.4.3.2 Exercise button / dialogue field
 - 5.4.3.3 Profile dialogue field

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(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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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

114	10.3 What-if analysis
115	11. Emulator on the smartphone
116	11.1 Installing the emulator on your smartphone
117	11.2 Checking loop decisions on the smartphone
118	11.3 Options available on i-Phone (for Trio or iAPS)
119	11.4 Real-time checking a „what-if“ question using speech synthesis
120	12. Remarks for users of previous autoISF version
121	13. Other avenues to Full Closed Loop
122	13.1 FCL using AAPS Master and Automations
123	Case study 13.1: Comparison 1 mo FCL Automation vs autoISF
124	13.2 dynamicISF used for Full Closed Loop
125	Case study 13.2: Using dynISF for FCL (NN)
126	13.3 Methods involving simple meal announcement that might be stretched into a FCL
127	13.3.1 Boost
128	Case study 13.3: Boost-based FCL for a child
129	13.3.2 AIMI,
130	13.3.3 EatingNow
131	13.3.4 Tsunami
132	13.4 No-bolus looping with precise carb Inputs
133	13.5 Machine Learning (AI)
134	13.6 Dual hormone systems