Sanity Check

L. Krieger, T. Neugarth, P. Samimi

August 2020

1   Introduction

The Traumschreiber 3 (internal reference) is tested with a sine generated by a function generator, induced to the channel in question. Here, Sinus signals with 5 Hz and 40 Hz and 50 and 100 mV are tested.
!Important!: There is a difference in channel naming between the board and the app, whereas the board starts with channel 0 and the app with channel 1. In this document the Board naming is used (Ch-0 to Ch-5).

2   Setup

Function Generator:
Traumschreiber: Internal Reference
Bluetooth Receiver: Developer Board and nRF

3   Experiment Overview

All recordings can be found at the project's GitHub.

Table 1: Board 03 with Internal Reference has been used. Charged while recordings via Powerbank

Experiment Number	Frequency	Voltage	Connected to Signal Generator's Ground	Active Channel
1	5 Hz	50 mV	AR and SG	0
2	5 Hz	50 mV	SG and 0	1
3	5 Hz	50 mV	SG and 1	2
4	5 Hz	50 mV	SG and 2	3
5	5 Hz	50 mV	SG and 3	4
6	5 Hz	50 mV	SG and 4	5
7	40 Hz	100 mV	AR and SG	0
8	40 Hz	100 mV	SG and 0	1
9	40 Hz	100 mV	SG and 1	2
10	40 Hz	100 mV	SG and 2	3
11	40 Hz	100 mV	SG and 3	4
12	40 Hz	100 mV	SG and 4	5
13	5 Hz	100 mV	AR and SG	0
14	5 Hz	100 mV	SG and 0	1
15	5 Hz	100 mV	SG and 1	2
16	5 Hz	100 mV	SG and 2	3
17	5 Hz	100 mV	SG and 3	4
18	5 Hz	100 mV	SG and 4	5
19	40 Hz	50 mV	AR and SG	0
20	40 Hz	50 mV	SG and 0	1
21	40 Hz	50 mV	SG and 1	2
22	40 Hz	50 mV	SG and 2	3
23	40 Hz	50 mV	SG and 3	4
24	40 Hz	50 mV	SG and 4	5

Table 2: Board 03 with Internal Reference has been used. Charged while recordings via Powerbank. Different VCM settings are tested

Exp. Number	Frequency	Voltage	Connected to Signal Generator's Ground	VCM	Active Channel
25	5 Hz	50 mV	SG and 8	of ADC 2 (switch 1)	9
26	40 Hz	100 mV	SG and 8	of ADC 2 (switch 1)	9
27	5 Hz	100 mV	SG and 8	of ADC 2 (switch 1)	9
28	40 Hz	50 mV	SG and 8	of ADC 2 (switch 1)	9

Table 3: Board 02 with External Reference has been used. Charged while recordings via Powerbank. Different VCM settings are tested

Exp. Number	Frequency	Voltage	Connected to Signal Generator's Ground	VCM	Active Channel
29	5 Hz	50 mV	SG and 8	of ADC 2 (switch 1)	9
30	40 Hz	100 mV	SG and 8	of ADC 2 (switch 1)	9
31	5 Hz	100 mV	SG and 8	of ADC 2 (switch 1)	9
32	40 Hz	50 mV	SG and 8	of ADC 2 (switch 1)	9

4 Results

All plots are collected in the project's GitHub.

4.1 Internal reference

Using the internal reference results in clear recordings in the active channel. Using channel 0 as active channel results in clean leakage, whereas channel 1, 3, and 4 produce a noisy leakage, channel 2 and 5 no leakage.
Using a different VCM results in similar recordings. Note that the channel naming of the channels in these plots is incorrect.

4.2 External reference

Signal is not clean.