WAcouSense

MCU FW PDM MIC related commands

mic <dB> [<Fs> [<pattern>]]

This command sets the amplification/attenuation **<db>** on PDM2PCM filter, the sample rate **<Fs>** and live MIC vs. play pattern from buffer **<pattern>**

<db>

0 : off (MIC disabled)
1..52 : amplification in dB: as dB – 1: 1 is 0dB
1xx : xx = 0..20 : attenuation as **-xx** dB

<Fs>

0 : (default) **48 Khz**
1 : 32 KHz
2 : 24 KHz
3 : 16 KHz (results in mono, why?)
4 : 8 KHz

<pattern>

0 : (default) **live PDM MIC** signal
1 : PCM sine wave (after/without PDM filter)
2 : PDM rectangle signal
3 : PDM sine signal
4 : PDM replay prerecorded PDM sine
5 : replay captured (recorded) live signal (see **mics**)

Examples:

mic 30	#live PDM signal, 30dB amplification, 48KHz
mic 30 1	#live PDM signal, 30dB amplification, 32KHz
mic 1 0 3	#play PDM sine wave (must be 48KHz only)

micc [<HP> [<filter>]]

This command sets filter parameters for PDM2PCM filter **<HP>** and selects which filter to use **<filter>**

<HP> (only for PDM2PCM filter)

0 : (default) HP filter off
1 : coefficient 1.0 (like off)
2 : coefficient 0.8 (strong HP filter, cuts of low frequencies below 100Hz)
3 : coefficient 0.9
4 : coefficient 0.98
5 : coefficient 0.995 (almost like off)

<filter>

0 : **own** PDM filter
1 : PDM2PCM filter, without Post Filter
2 : own PDM filter (the same as 0)
3 : PDM2PCM filter, with Post Filter (additional LP filter to remove above 10KHz)

micv <v1> <v2>

This command sets filter volume scaling factors: **<v1>** is used to convert int to float before filters are applied (input scaling), **<v2>** scales up the int values after filtering (output scaling). The v1 and v2 have just an effect if: a) the PDM2PCM **Post Filter** is enabled or b) "own PDM Filter" is used.

Typical examples for **Post Filter**:

```
micv 1 27520          #default
micv 2 13750
micv 4 6850
micv 8 3420
micv 16 1710
```

In case "own PDM Filter" is used:
v1 is integer multiplier to upscale results (output only), v2 is factional part, taken as v2 / 100000.

If both are zero (omitted) – signal is completely muted.

mics

This command captures a period of a real PDM MIC live signal.
It works only for 48KHz Fs.
This capture (snapshot) can be replayed with command:

```
mic <db> 0 5      #play (looping) recorded capture
```

Remark:
This command prints a lot of hex values on UART. This is intended to "*copy and paste*" as samples into C source code (see pattern as 4), as a replay pattern.

Replaying recorded capture or pattern with a different **<Fs>** will result in a pitch change.

Syntax explanation:

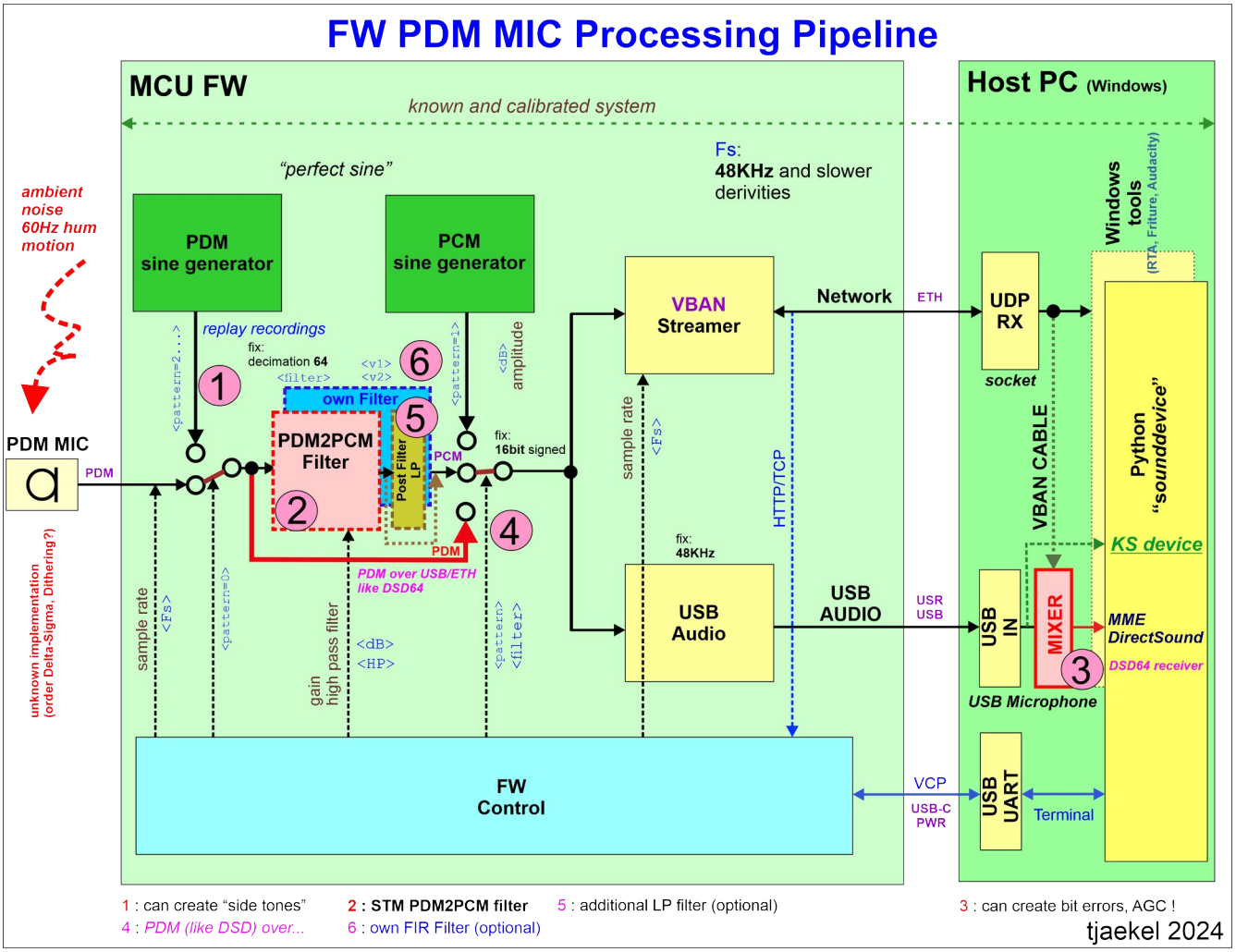
<dB> : a value, as mandatory, as an unsigned long (just positive) value, e.g. 3

[…] : optional parameters, when omitted taken as 0 (default)

Parameters can be omitted if they are on the most right hand side. A parameter as 0 on the left hand side with a following parameter not zero - it must be provided as 0.

The signs < > [ ] used here are not part of a command. It just illustrates what is mandatory or optional.

Audio Processing Pipeline and effects of command parameters



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