Guideline: How to use digital filter of FLOW^{EVO} sensor

From FLOW^{EVO} firmware 5.52, two digital filters are available.

These filters can be configured by Modbus Register settings as well as with the smartGAS Calibration Tool.

The smartGAS Calibration Tool can be downloaded via www.smartgas.eu/en/products/software

moving average filter - FIR filter (default)

moving average filter	
ON	**OFF**
• lower noise level • output with a higher time delay	• higher noise level • output with a lower time delay

biquad filter - IIR filter

biquad filter	
ON	**OFF**
• lower noise level • output with a slight time offset	• higher noise level • output with a lower time delay

The following system settings can be set in the firmware:

configuration	moving average filter	*biquad Filter*	*noise*	*time response*
1	**OFF**	**OFF**	high	fast
2	**OFF**	**ON**	reduced	varies on the signal shape
3	**ON**	**OFF**	reduced	slow
4	**ON**	**ON**	strongly reduced	very slow

Default setting (smartGAS standard):

The typical delivery state, to which the values in the data sheets also refer, is number 3 (moving average filter ON and biquad filter OFF).
The "fast mode" named in smartGAS data sheets and manuals is configuration 1, where both filters are switched off.

Application

1. applications with short T_{90} time (e.g. <60s) or where the signal is integrated

- TOC – COD
- breath gas analysis
- solid analysis

2. applications with long T_{90} time (e.g. >60s) and dynamic peaks

- car-exhaust gases
- special chemical processes

3. applications with long T_{90} time (e.g. >60s)

- emission measurement,
- biogas
- diesel engine exhaust gas measurement
- gas mixing
- air separation
- air quality measurement
- artificial atmosphere
- food industry
- fruit ripening

4. extremely slow application with low noise requirement