

Filters

I do not use filters with Flowcode. However, it would be easy and convenient to install such filters.

This is not a simple sensor. There are two sensors in one housing. 3D accelerometer, 3D gyroscope, is one and the 3D magnetometer is the another one.

However, the sensor itself has built-in filters. I do not yet have access to what these filters are set to. But I will try to read and configure these filters. Would it be possible to update the sensor?

So the register reading and writing works

7.25 CTRL_REG7_XL (21h)

Linear acceleration sensor Control Register 7.

Table 69. CTRL_REG7_XL register

HR	DCF1	DCF0	0 ⁽¹⁾	0 ⁽¹⁾	FDS	0 ⁽¹⁾	HPIS1
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1. These bits must be set to '0' for the correct operation of the device

LSM9DS1

Accelerometer and gyroscope register description

Table 70. CTRL_REG7_XL register description

HR	High resolution mode for accelerometer enable. Default value: 0 (0: disabled; 1: enabled). Refer to Table 71
DCF[1:0]	Accelerometer digital filter (high pass and low pass) cutoff frequency selection: the bandwidth of the high-pass filter depends on the selected ODR. Refer to Table 71
FDS	Filtered data selection. Default value: 0 (0: internal filter bypassed; 1: data from internal filter sent to output register and FIFO)
HPIS1	High-pass filter enabled for acceleration sensor interrupt function on Interrupt. Default value: 0 (0: filter bypassed; 1: filter enabled)

Table 71. Low pass cutoff frequency in high resolution mode (HR = 1)

HR	CTRL_REG7 (DCF [1:0])	LP cutoff freq. [Hz]
1	00	ODR/50
1	01	ODR/100
1	10	ODR/9
1	11	ODR/400

Table 67. CTRL_REG6_XL register description

ODR_XL [2:0]	Output data rate and power mode selection. default value: 000 (see Table 68)
FS_XL [1:0]	Accelerometer full-scale selection. Default value: 00 (00: $\pm 2g$; 01: $\pm 16g$; 10: $\pm 4g$; 11: $\pm 8g$)
BW_SCAL_ ODR	Bandwidth selection. Default value: 0 (0: bandwidth determined by ODR selection: - BW = 408 Hz when ODR = 952 Hz, 50 Hz, 10 Hz; - BW = 211 Hz when ODR = 476 Hz; - BW = 105 Hz when ODR = 238 Hz; - BW = 50 Hz when ODR = 119 Hz; 1: bandwidth selected according to BW_XL [2:1] selection)
BW_XL [1:0]	Anti-aliasing filter bandwidth selection. Default value: 00 (00: 408 Hz; 01: 211 Hz; 10: 105 Hz; 11: 50 Hz)

ODR_XL [2:0] is used to set power mode and ODR selection. [Table 68](#) indicates all the frequencies available when only the accelerometer is activated.

Table 52. Gyroscope high-pass **filter** cutoff frequency configuration [Hz]⁽¹⁾

HPCF_G [3:0]	ODR= 14.9 Hz	ODR= 59.5 Hz	ODR= 119 Hz	ODR= 238 Hz	ODR= 476 Hz	ODR= 952 Hz
0000	1	4	8	15	30	57
0001	0.5	2	4	8	15	30
0010	0.2	1	2	4	8	15
0011	0.1	0.5	1	2	4	8
0100	0.05	0.2	0.5	1	2	4
0101	0.02	0.1	0.2	0.5	1	2
0110	0.01	0.05	0.1	0.2	0.5	1
0111	0.005	0.02	0.05	0.1	0.2	0.5
1000	0.002	0.01	0.02	0.05	0.1	0.2
1001	0.001	0.005	0.01	0.02	0.05	0.1

1. Values in the table are indicative and can vary proportionally with the specific ODR value.

CTRL_REG3_G (12h)

Angular rate sensor Control Register 3.

Table 50. CTRL_REG3_G register

LP_mode	HP_EN	0 ⁽¹⁾	0 ⁽¹⁾	HPCF3_G	HPCF2_G	HPCF1_G	HPCF0_G
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1. These bits must be set to '0' for the correct operation of the device

Table 51. CTRL_REG3_G register description

LP_mode	Low-power mode enable. Default value: 0 (0: Low-power disabled; 1: Low-power enabled)
HP_EN	High-pass filter enable. Default value: 0 (0: HPF disabled; 1: HPF enabled, refer to Figure 28)
HPCF_G [3:0]	Gyroscope high-pass filter cutoff frequency selection. Default value: 0000 Refer to Table 52 .

7.8 REFERENCE_G (0Bh)

Angular rate sensor reference value register for digital high-pass filter (r/w).

Table 37. REFERENCE_G register

REF7_G	REF6_G	REF5_G	REF4_G	REF3_G	REF2_G	REF1_G	REF0_G
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Table 38. REFERENCE_G register description

REF_G [7:0]	Reference value for gyroscope's digital high-pass filter (r/w). Default value: 0000 0000
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