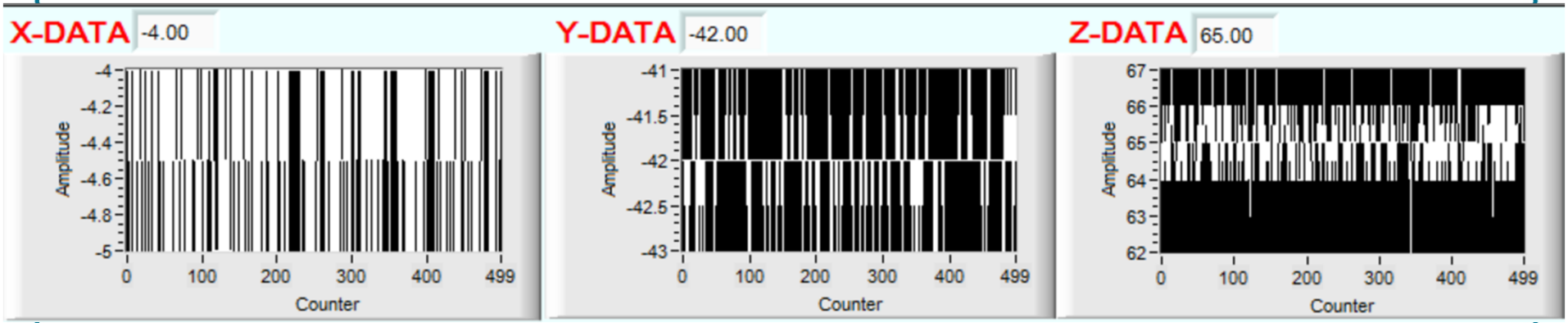
iSentek
IST8310 e-Compass

ODR
vs.
Noise Performance

IST8310: ODR vs. Noise Performance Experiment

- Experiment Steps:
  1. Put IST8310 in a shielding box to avoid environmental noise's interference.
  2. Measure IST8310's noise performance under 1Hz, 5Hz, 10Hz, 25Hz, 50Hz, 100Hz and 166Hz Output Data Rate (ODR); 500 data points for each frequency.
  3. Calculate the Standard Deviation (STD) for RMS noise. (Raw data are stored in the unit of LSB)
  4. Convert LSB to mG. (1 LSB = 3 mG for IST8310)

IST8310: Noise Performance @ 1Hz ODR



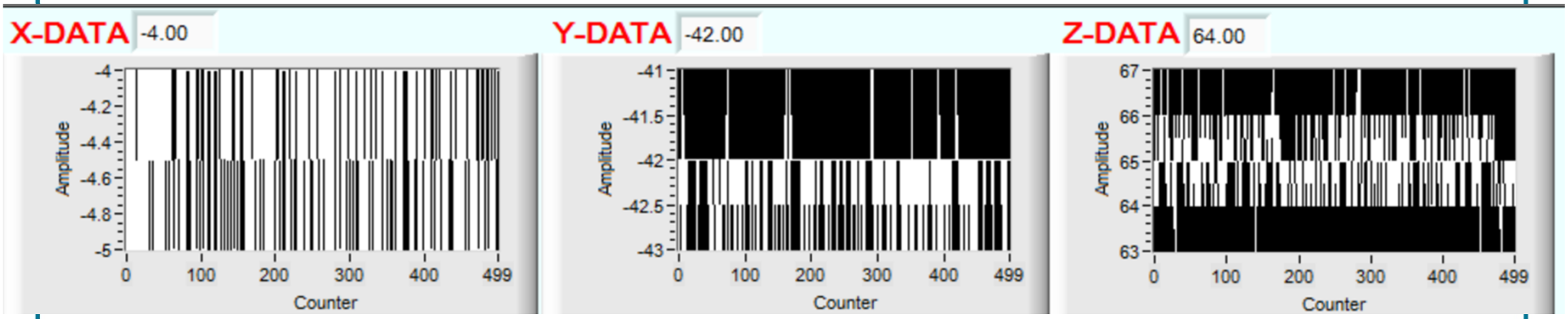
STD (T,X,Y,Z) (Unit: LSB)

0.47164	0.381466	0.815007

* 1LSB = 3mG

Noise Performance: (X, Y, Z)= (1.41, 1.14, 2.45) mG

IST8310: Noise Performance @ 5Hz ODR



STD (T,X,Y,Z)	(Unit: LSB)	
0.495076	0.432902	0.814705

* 1LSB = 3mG

Noise Performance: (X, Y, Z)= (1.49, 1.30, 2.44) mG

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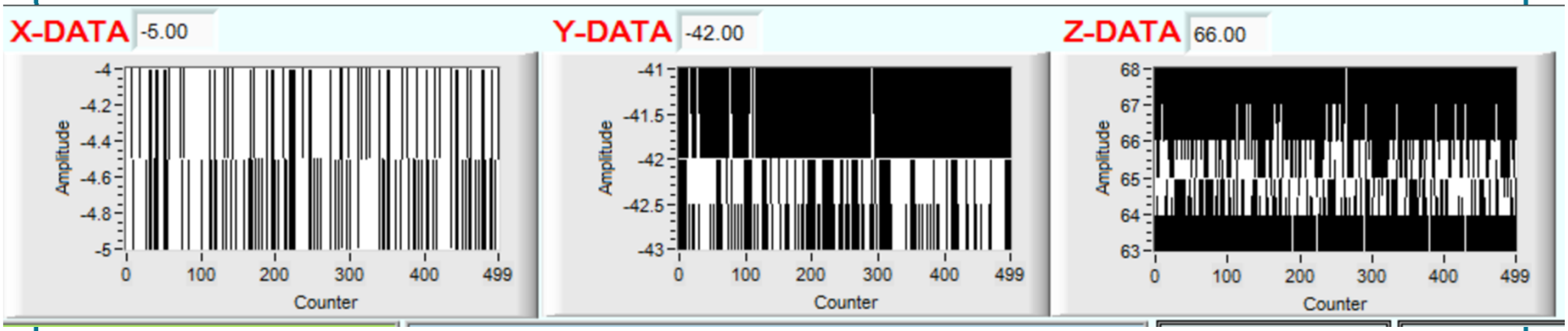
IST8310: Noise Performance @ 10Hz ODR



STD (T,X,Y,Z) (Unit: LSB)		
0.48438	0.428952	0.825811

* 1LSB = 3mG

Noise Performance: (X, Y, Z)= (1.45, 1.29, 2.48) mG

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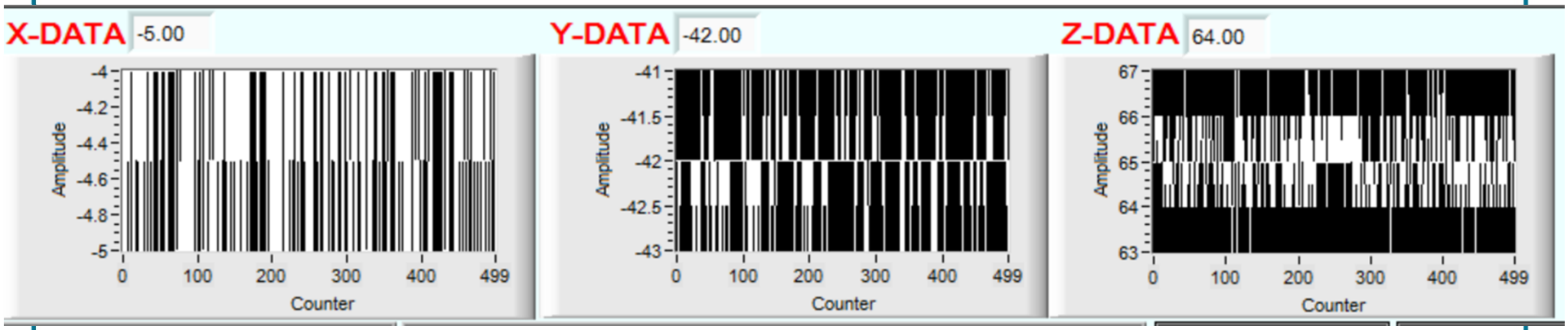
IST8310: Noise Performance @ 25Hz ODR



STD (T,X,Y,Z) (Unit: LSB)		
0.461667	0.415399	0.829156

* 1LSB = 3mG

Noise Performance: (X, Y, Z)= (1.38, 1.25, 2.49) mG

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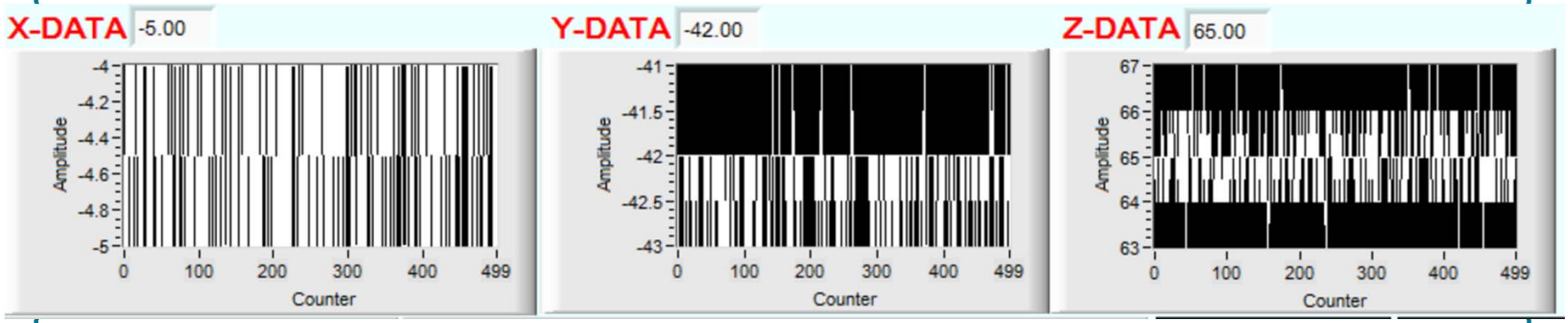
IST8310: Noise Performance @ 50Hz ODR



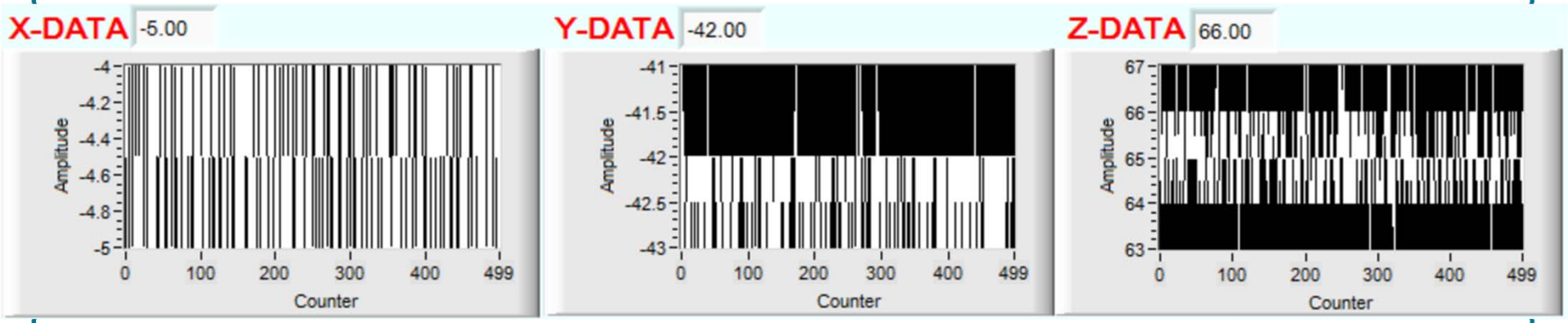
STD (T,X,Y,Z) (Unit: LSB)

0.495076	0.460452	0.791343

* 1LSB = 3mG

Noise Performance: (X, Y, Z)= (1.49, 1.38, 2.37) mG

IST8310: Noise Performance @ 100Hz ODR



STD (T,X,Y,Z) (Unit: LSB)		
0.49806	0.491056	0.838093

* 1LSB = 3mG

Noise Performance: (X, Y, Z)= (1.49, 1.47, 2.51) mG

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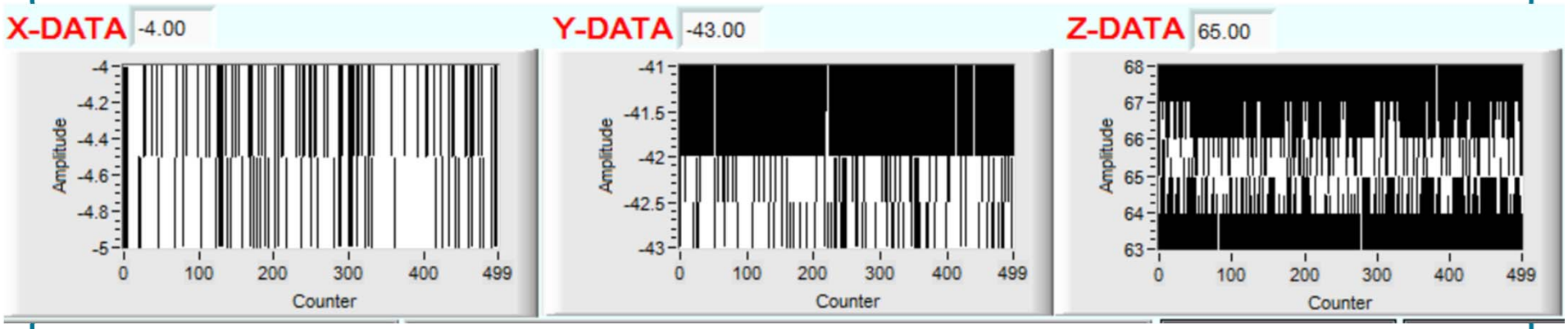
IST8310: Noise Performance @ 166Hz ODR



STD (T,X,Y,Z) (Unit: LSB)		
0.490697	0.514494	0.859793

* 1LSB = 3mG

Noise Performance: (X, Y, Z)= (1.47, 1.53, 2.58) mG

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Short Summary

- For IST8310, noise performance varies very little with ODR.
- Noise performance differences in the experiments are mainly due to statistic error (500 data points are not sufficient for very high precision measurement).
- IST8310' noise performance is better than xxx5883L in x & y-axis (<1.5mG vs 2.xmG) and comparable in z-axis (~2.5mG).

*Please find the raw data of the experiments attached in the zip file.

Thank You

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