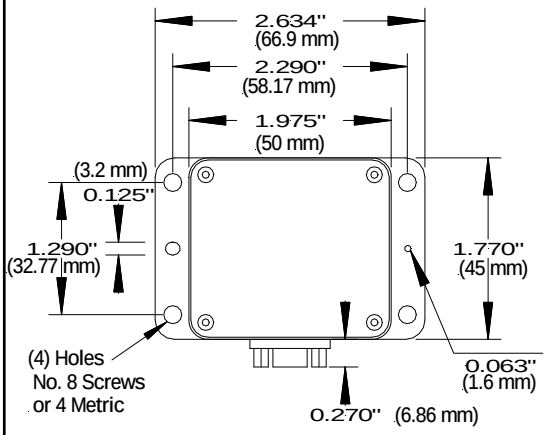
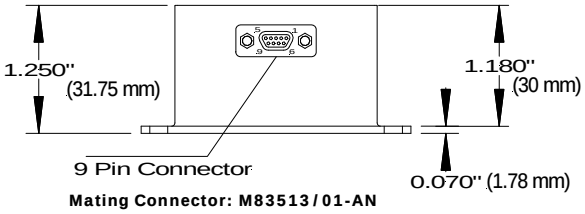
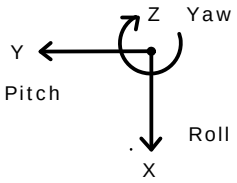
LandMark™ 10 IMU





Mating Connector: M83513/01-AN

Axes (Top View)
Right Hand Rule



LandMark™ 10 IMU
LMRK10IMU-075-**02**-200 or -**10**
LMRK10IMU-150-**02**-200 or -**10**
LMRK10IMU-300-**02**-200 or -**10**

Pin No.	Assignment
1	RS-485 A (+)
2	RS-485 B (-)
3	Power Ground
4	Analog/Digital Input (0V to 5V)
5	**+3.1V to +5.5V Input Power**
6	External Sync Input (1kHz or 1pps)
7	+5V Regulator Out
8	Signal Ground
9	Self Test

Note: Any unused inputs (Pins 4, 6, 9) must be connected to signal ground (Pin 8).

Outputs	Serial Sequence at 200Hz
1	Roll Gyro (X)
2	Pitch Gyro (Y)
3	Yaw Gyro (Z)
4	X Accelerometer
5	Y Accelerometer
6	Z Accelerometer
7	Temperature ± 0.5º C *typical*

Specification

PARAMETER	RATE AXES			ACCEL AXES	
Range	±75°/sec	±150°/sec	±300°/sec	±2 g's	±10 g's
Bias (Over Temp.)	<0.1°/sec *1σ*			<3mg *1σ*	<5mg
Bias (In Run Stability)	25°/hour *1σ*			0.1mg *1σ*	0.25mg
Scale Factor Error %	≤0.2% *(over temperature) 1σ*				
Sensor Resolution	0.007°/sec			0.035mg	0.25mg
Angle Random Walk	0.012° /sec/√Hz *1σ*			0.07mg /√Hz *1σ*	0.15mg
Alignment	1 mrad *1σ*				
G-Sensitivity	<0.03°/sec/g *1σ*				
Self Test On	Δ 50 ± 25°/sec			Δ1.5g ±0.5g	Δ0.6g ±0.4g
	Logic 1 = 3V to 5V at Pin 9				
Temp Range Operating: Non-Operating:	-40°C to +85°C -55°C to +85°C				
Update Rate	500 Hz, 200 Hz, 100 Hz, or 10 Hz *(user selectable)*				
Temp Sensors	3 Internal Temperature Sensors				
Start-up Time	< 0.3 sec *at 200 Hz*				
Input Power	**+3.1V to 5.5V Max. Input (*single sided*)**				
Power Consumption	440 mW at 3.3V *Typical* 500 mW at 3.3V *Maximum*				
Size U.S.: Metric:	1.97 x 1.77 x 1.25 = 4.4 in^3 5 x 4.5 x 3.2 = 72 cm^3				
Weight	≤ 105 grams				
Mounting	4ea No.8 or M4 Screws				
Shock	500g's ½ sine 30 msec powered				
Vibration	6gRMS *(20Hz to 2kHz ~ 10g accelerometers)*				
MTBF	55,279 hrs (per MIL-STD-217F, Notice 2 based on AIC environment *with ambient temperature at 40°C)*				

** Contact Factory to Order VG Option*

Specification subject to change without notice

Gladiator Technologies
High Performance Inertial MEMS

Rev.14Feb11
SN: 512

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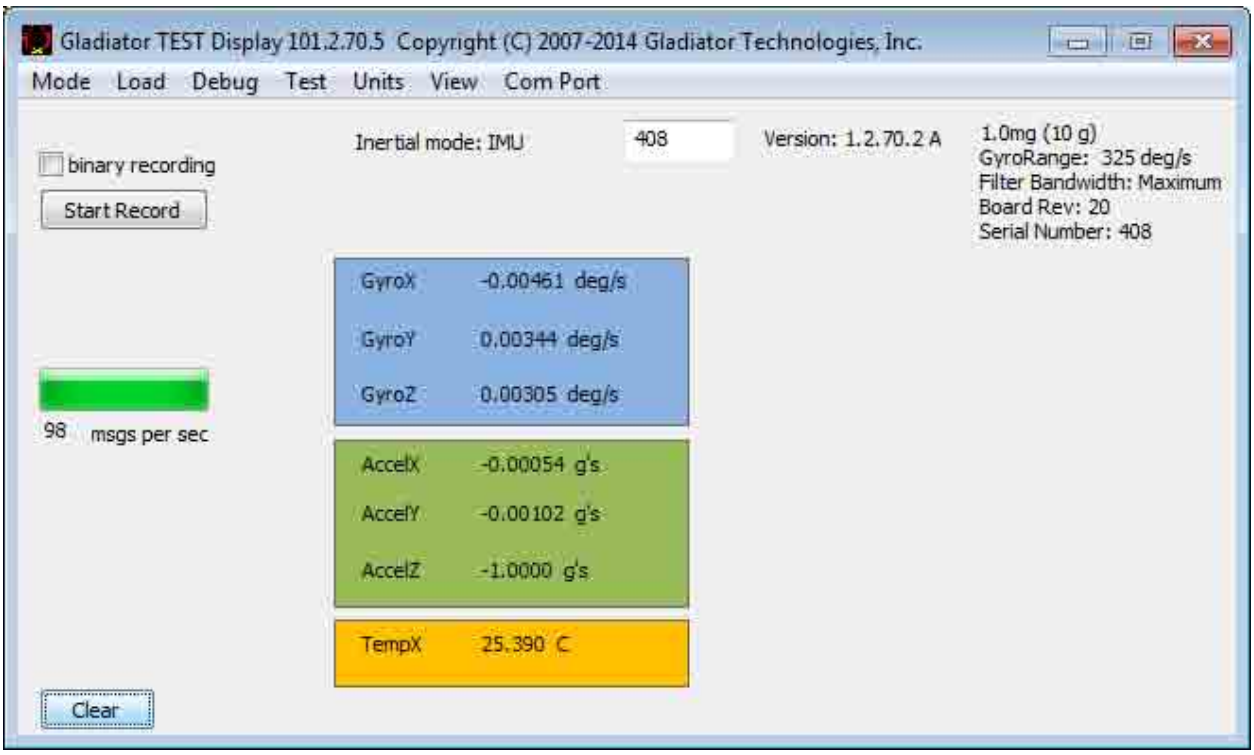
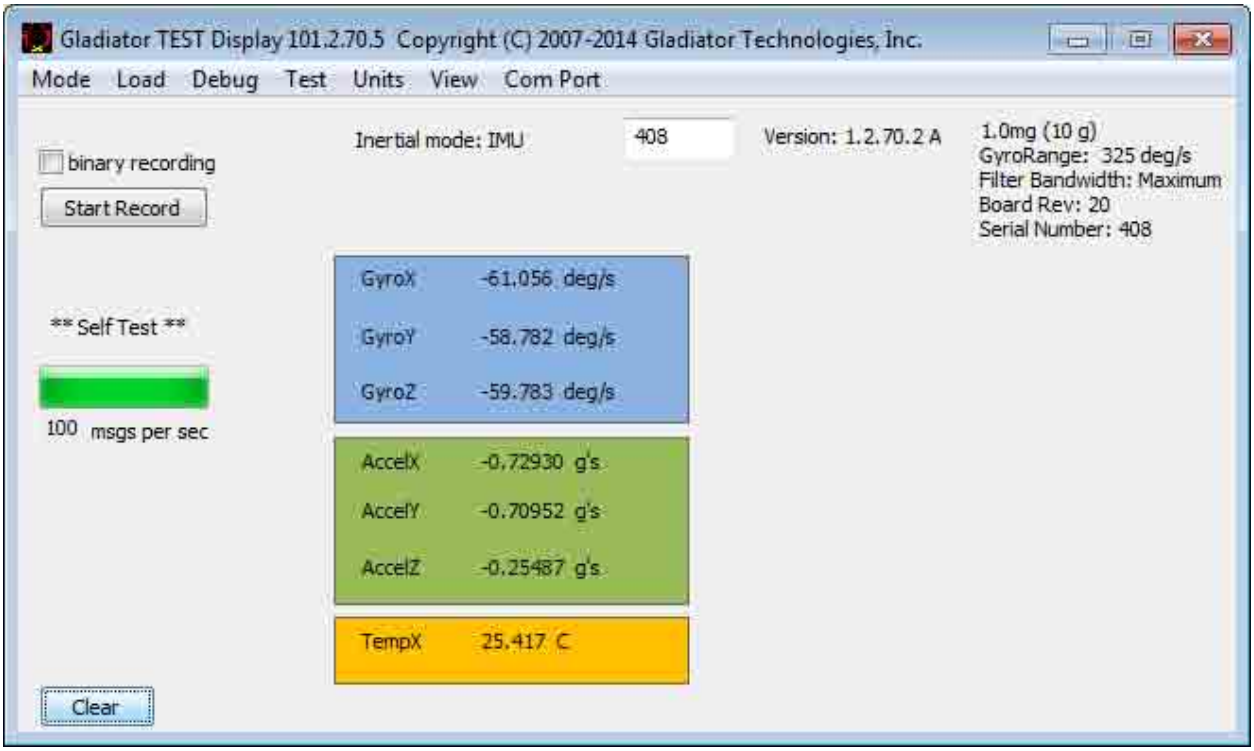


Initial Bench Readout (above) Self Test (below)



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Gladiator Technologies
High Performance Inertial MEMS

SN408 ATP

5/05/2014

LMRK10IMU-300-10-205

Rate Spin Test

Test	gyroX	gyroY	gyroZ	accelX	accelY	accelZ	temp X
PX	14404.92	-7.581	4.183	0.369	-1.5785	-18.41	2409.618
NX	-14402.14	-12.036	2.746	0.2235	2.68	-18.351	2410.319
Diff/2	14403.53	2.2275	0.7185	0.07275	-2.12925	-0.0295	-0.3505
Ave	1.391	-9.8085	3.4645	0.29625	0.55075	-18.3805	2409.969
PY	-14	14406.73	0.225	1.0405	0.6765	-18.466	2403.796
NY	-5.842	-14398.14	-0.028	-2.9265	0.58	-18.24	2404.06
Diff/2	-4.079	14402.43	0.1265	1.9835	0.04825	-0.113	-0.132
Ave	-9.921	4.293	0.0985	-0.943	0.62825	-18.353	2403.928
PZ	-9.303	-13.647	14400.78	-2.075	0.334	-0.0305	2401.596
NZ	-6.995	-11.718	-14400.63	2.2985	0.496	0.05	2401.223
Diff/2	-1.154	-0.9645	14400.71	-2.18675	-0.081	-0.04025	0.1865
Ave	-8.149	-12.6825	0.073	0.11175	0.415	0.00975	2401.41
RSF Norm	1.000245	1.000169	1.000049				Temp ºC 24.05

Gyro Mis-Align deg/sec

				Input Rate
x		-0.04	-0.01	x
y	0.02		-0.01	y
z	0.01	0.00		z

Gyro Mis-align mrad

				Input Rate
x		-0.28	-0.08	x
y	0.15		-0.07	y
z	0.05	0.01		z

Accepted by:

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Gladiator Technologies
High Performance Inertial MEMS

SN408 ATP

5/05/2014

LMRK10IMU-300-10-205
Accelerometer Tumble Test

Test	gyroX	gyroY	gyroZ	accelX	accelY	accelZ	temp X
PX	-2.798	1.579	-1.123	999.335	0.906	-0.1725	2404.106
NX	-0.676	1.144	-0.826	-1000.863	0.1645	-0.6275	2404.063
Diff/2	-1.061	0.2175	-0.1485	1000.099	0.37075	0.2275	0.0215
Ave	-1.737	1.3615	-0.9745	-0.764	0.53525	-0.4	2404.085
PY	-1.17	2.517	-0.884	0.4305	1001.066	0.266	2406.637
NY	-0.825	1.53	-1.905	0.573	-999.225	-0.956	2408.281
Diff/2	-0.1725	0.4935	0.5105	-0.07125	1000.146	0.611	-0.822
Ave	-0.9975	2.0235	-1.3945	0.50175	0.9205	-0.345	2407.459
PZ	-0.918	1.428	-0.641	0.4905	-0.3715	1000.469	2408.311
NZ	-1.409	3.308	-1.232	0.258	1.348	-999.2885	2405.282
Diff/2	0.2455	-0.94	0.2955	0.11625	-0.85975	999.8788	1.5145
Ave	-1.1635	2.368	-0.9365	0.37425	0.48825	0.59025	2406.797
Bias º/s,mg	-0.013	0.019	-0.011	0.44	0.51	-0.37	24.06
ASF Norm				1.0001	1.0001	0.9999	Temp ºC

Gyro º/s /g		Input g =	Accel In g's
x	-0.011	-0.002	0.002	x
y	0.002	0.005	-0.009	y
z	-0.001	0.005	0.003	z

	Accel Mis-Align	mrads	Accel In
	-0.07	0.12	x
0.37		-0.86	y
0.23	0.61		z

Accepted by:

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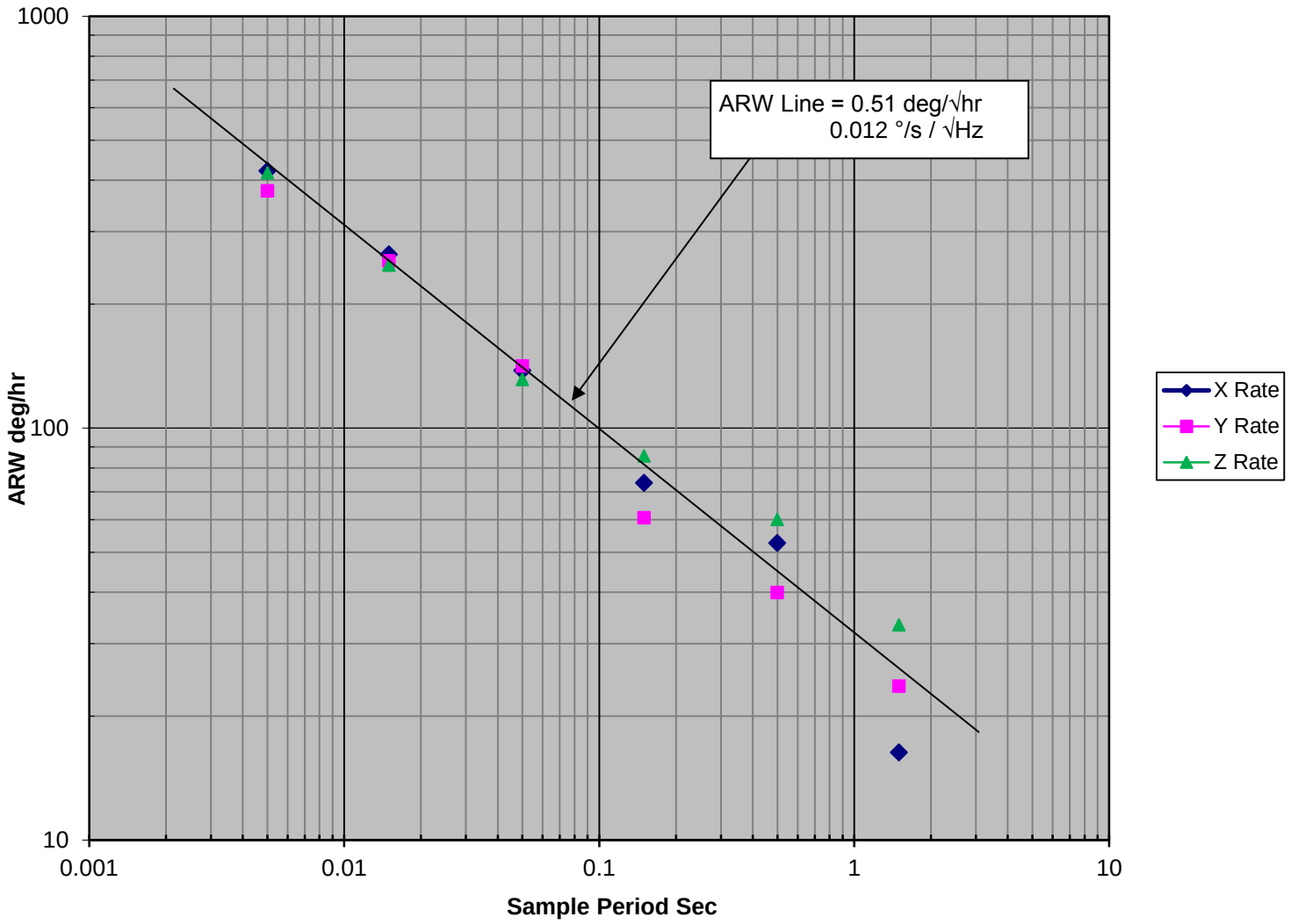
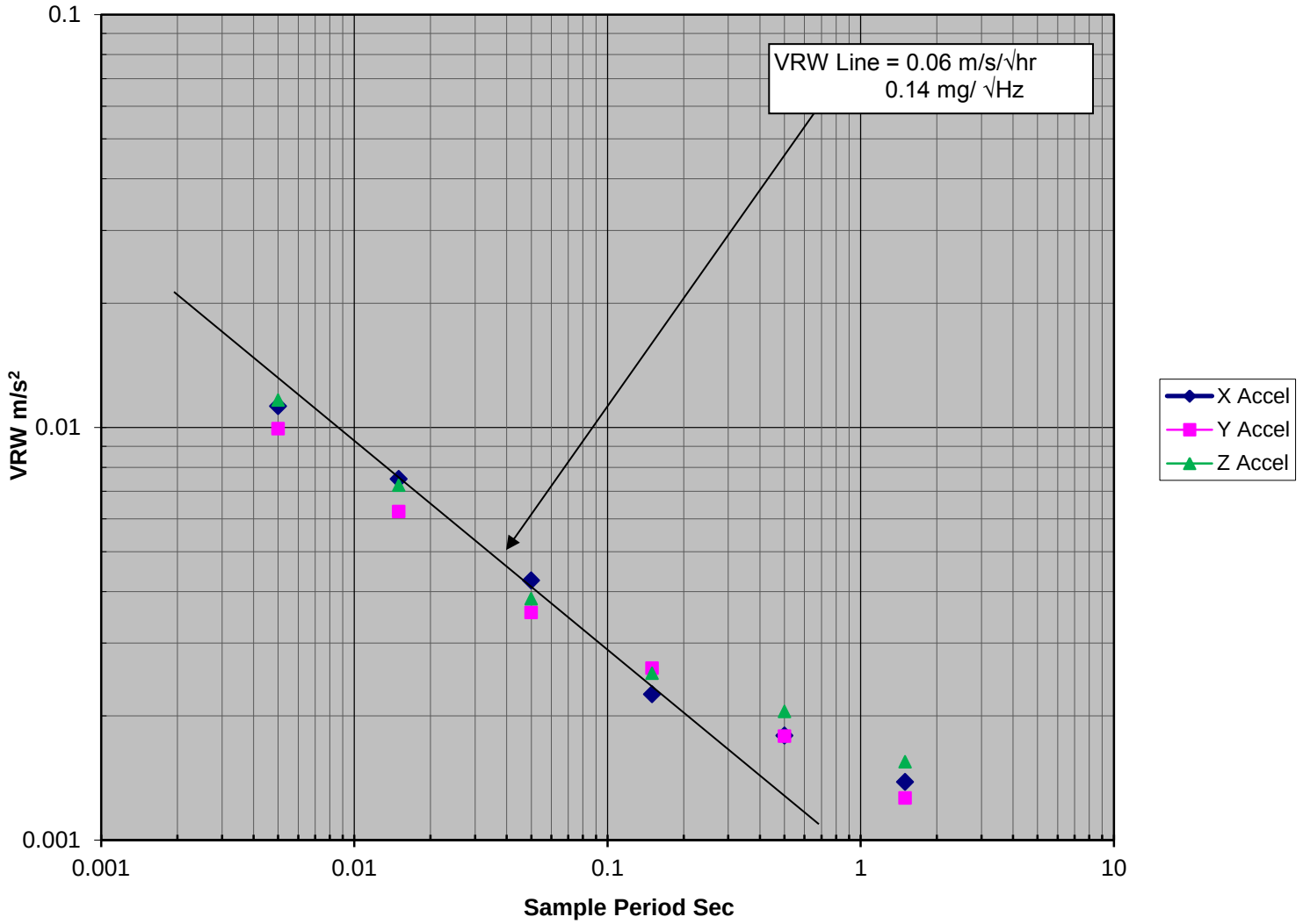

1000
100
10
ARW deg/hr
0.001
0.01
0.1
1
10
Sample Period Sec
ARW Line = 0.51 deg/√hr
0.012 °/s / √Hz
X Rate
Y Rate
Z Rate



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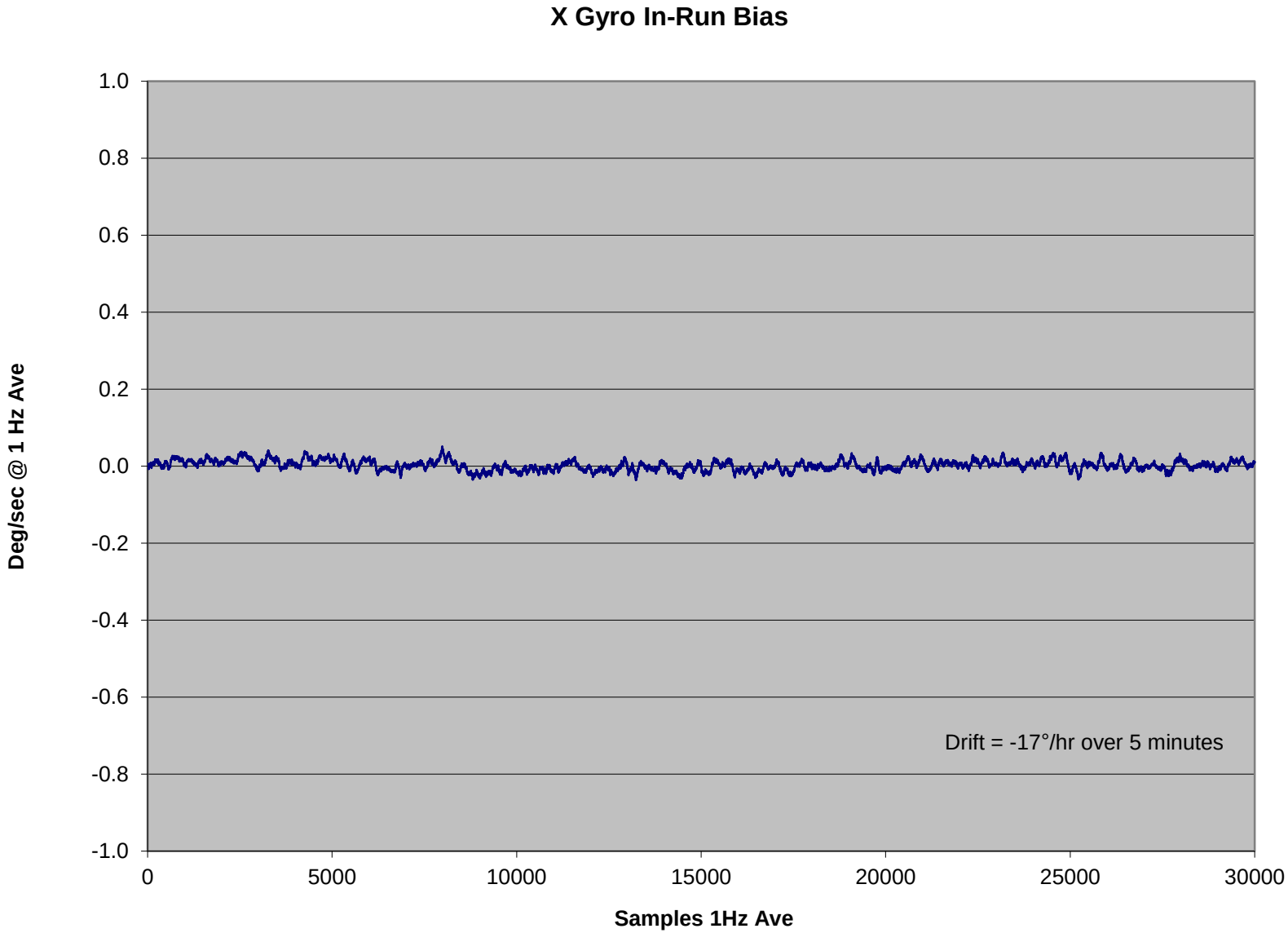

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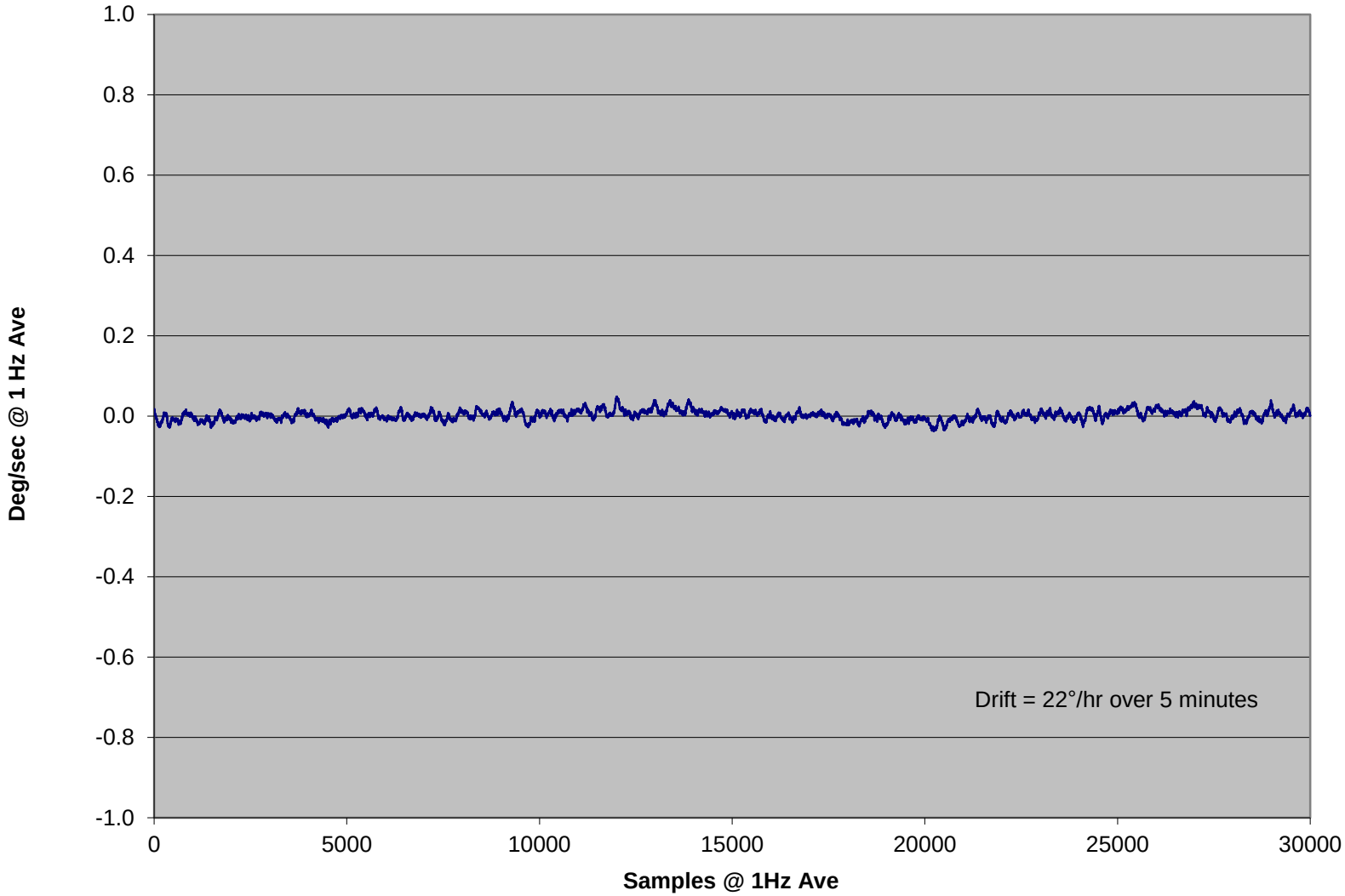
Y Gyro In-Run Bias



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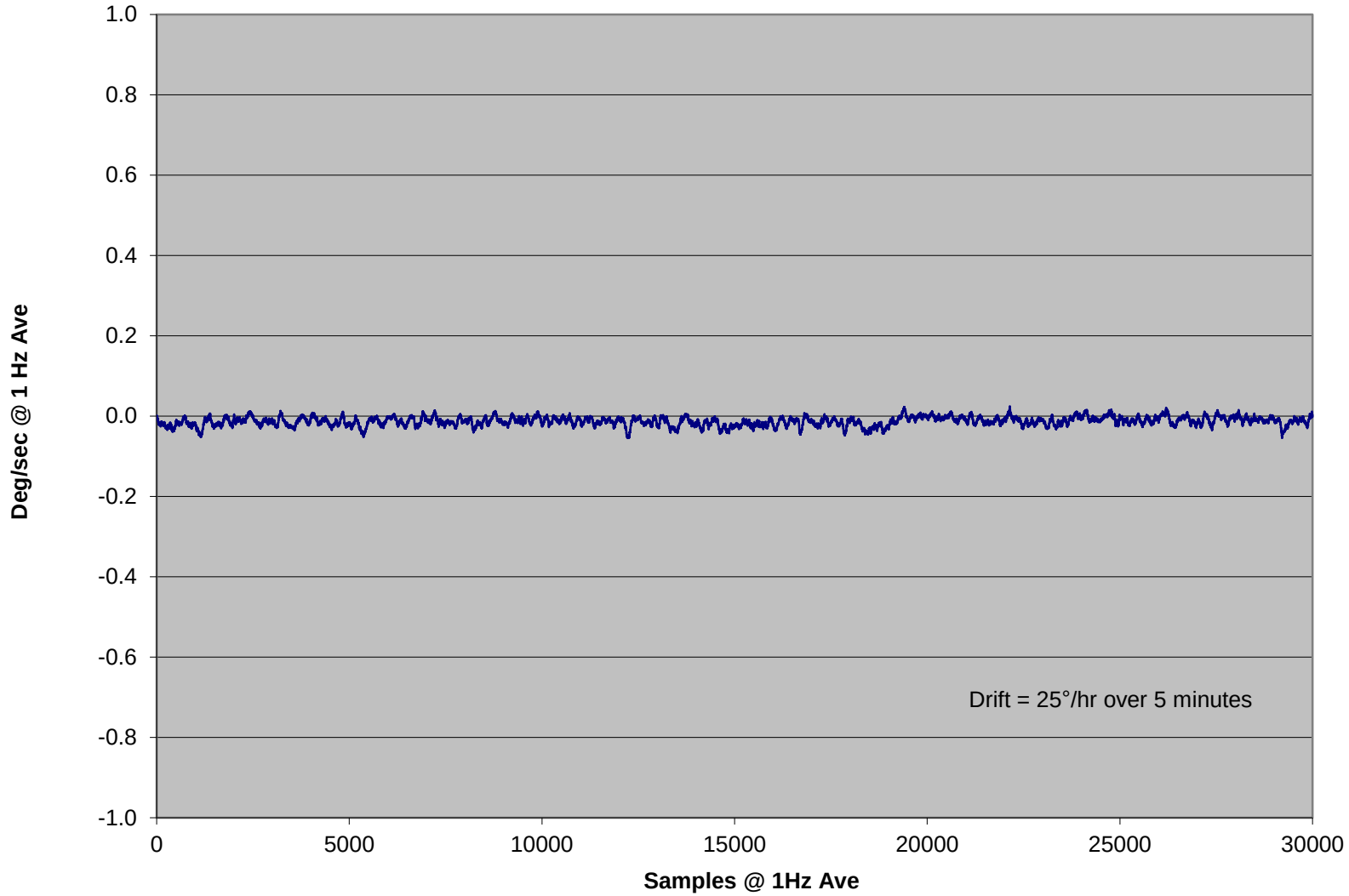
Z Gyro In-Run Bias



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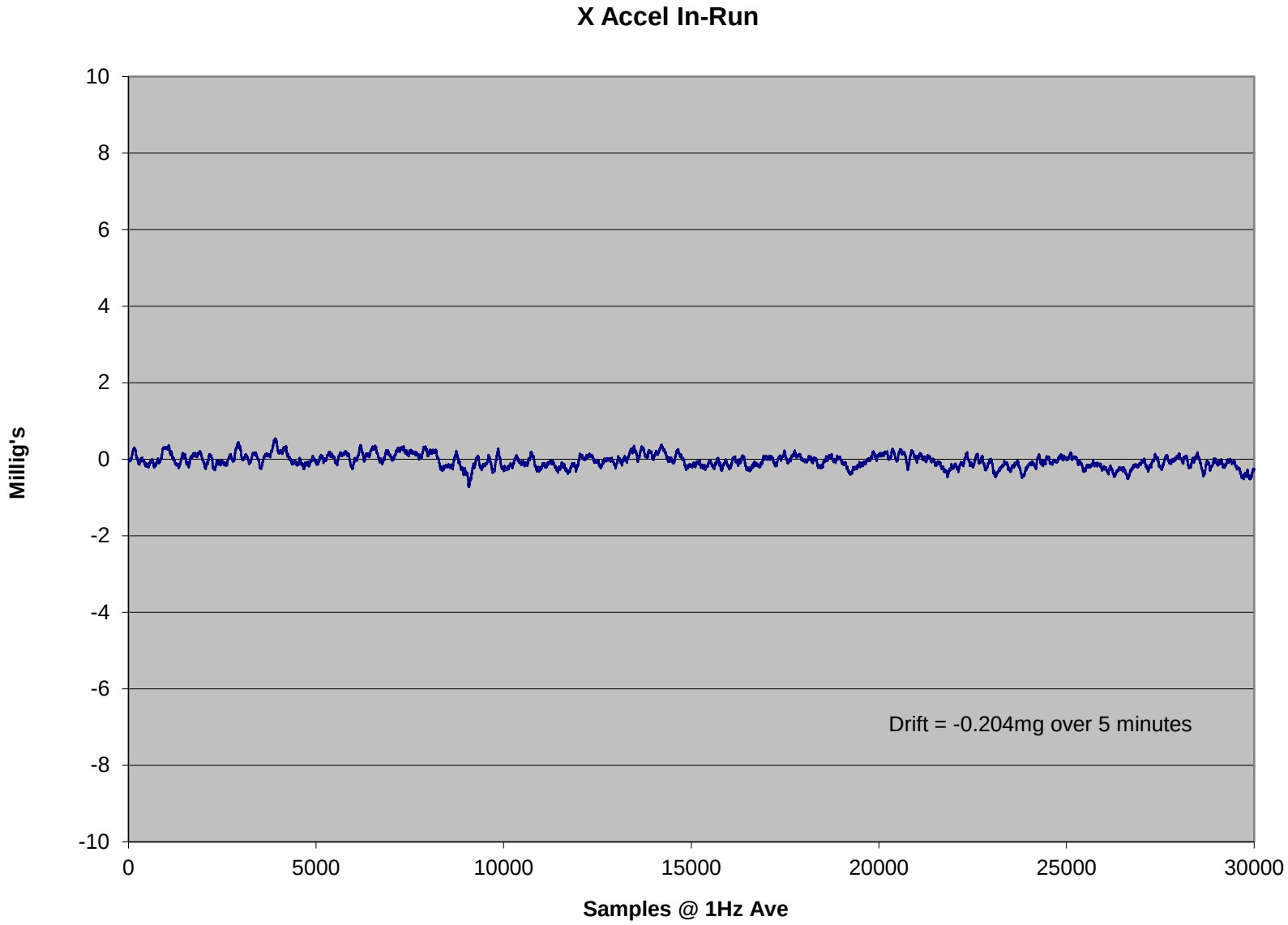

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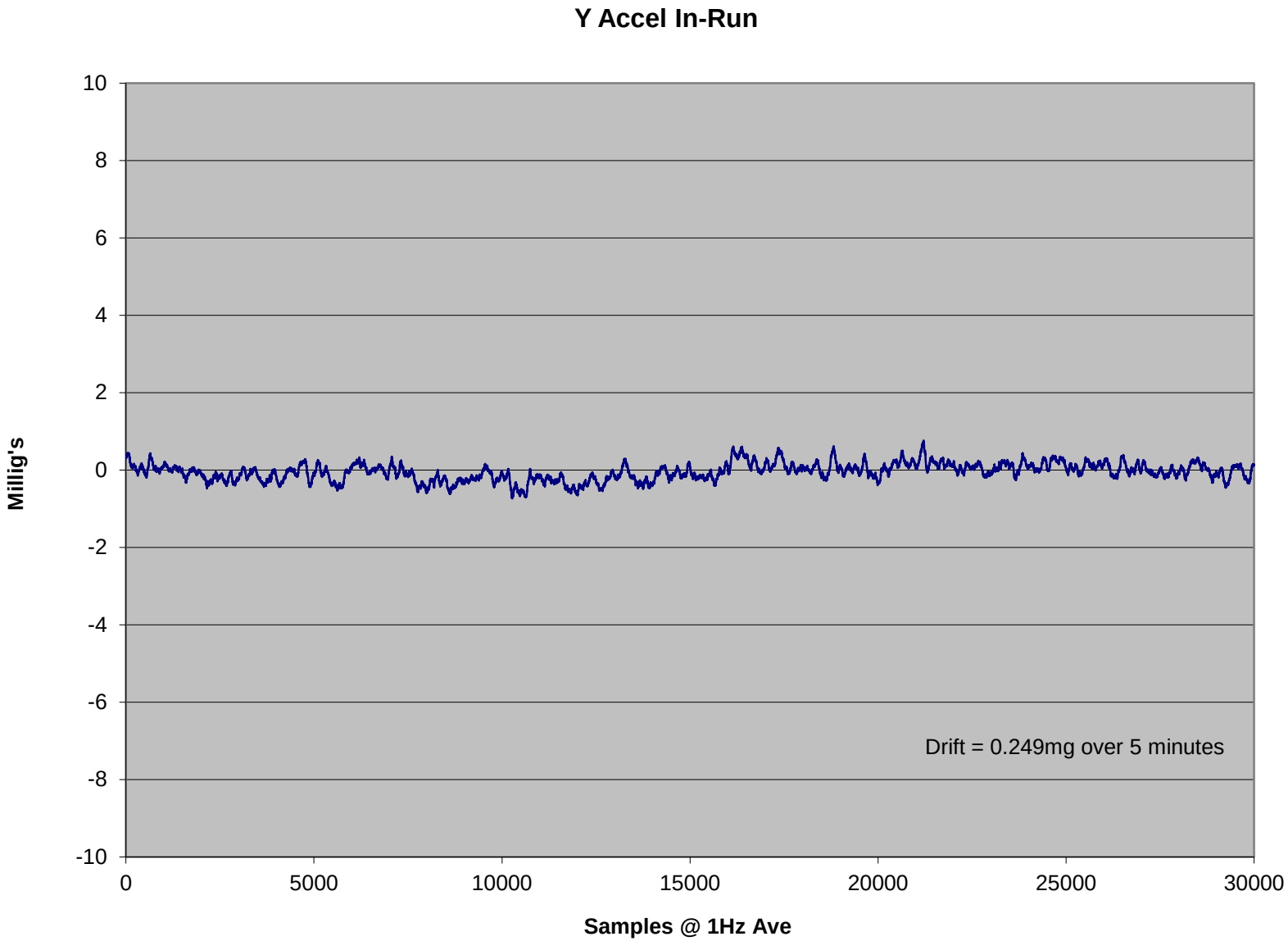

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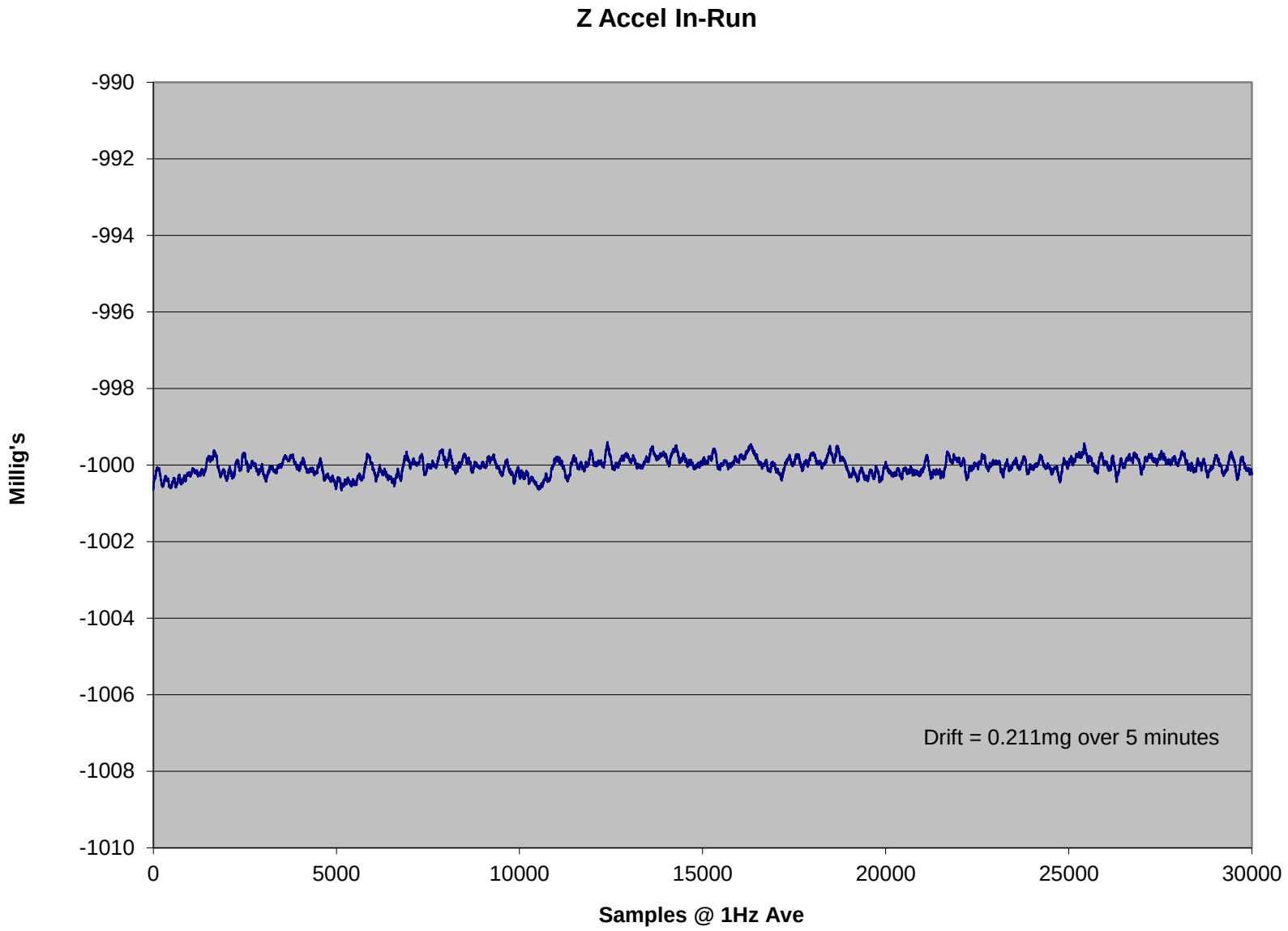

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