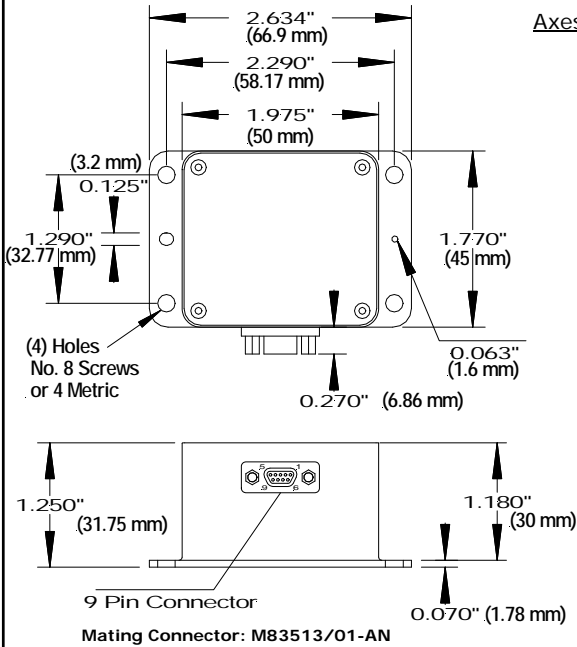
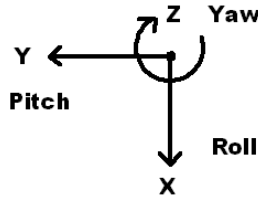


LandMark™ 20 IMU



Axes (Top View) Right Hand Rule



LandMark™ 20 IMU

LMRK20IMU-075-02-300 or -10
LMRK20IMU-150-02-300 or -10
LMRK20IMU-300-02-300 or -10

Specification

PARAMETER	RATE AXES			ACCEL AXES	
	±75°/sec	±150°/sec	±300°/sec	±2 g's	±10 g's
Range	±75°/sec	±150°/sec	±300°/sec	±2 g's	±10 g's
Bias (Over Temp.)	<0.05°/sec 1 σ			< 1.0mg 1 σ	< 1.5mg 1 σ
Bias (In Run Stability)	15°/hour 1 σ			0.02mg 1 σ	0.1mg 1 σ
Scale Factor Error %	≤0.1% (over temperature) 1 σ				
Sensor Resolution	0.005°/sec			0.025mg	0.08mg
Angle Random Walk	0.01°/ /sec/√Hz 1 σ			0.05mg /√Hz 1 σ	0.16mg /√Hz 1 σ
Alignment	1mrad 1 σ				
G-Sensitivity	<0.02°/sec/g 1 σ				
Self Test On	Δ 50 ± 25°/sec			Δ 1.5 ±0.5g	Δ 0.3 ±0.2g
	Logic 1 = 5V at Pin 9				
Temp Range	Operating: -40° C to +85° C Non-Operating: -55° C to +85° C				
Update Rate	500 Hz, 200 Hz, 100 Hz, or 10 Hz (user selectable)				
Temp Sensors	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	400 mW at 3.3V Typical 450 mW at 3.3V Maximum				
Size	U.S.:	1.97 x 1.77 x 1.25 = 4.4 in ³			
	Metric:	5 x 4.5 x 3.2 = 72 cm ³			
Weight	≤ 110 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)				

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 ± 0.5° C typical

Specification subject to change without notice



Gladiator Technologies



High Performance Inertial MEMS

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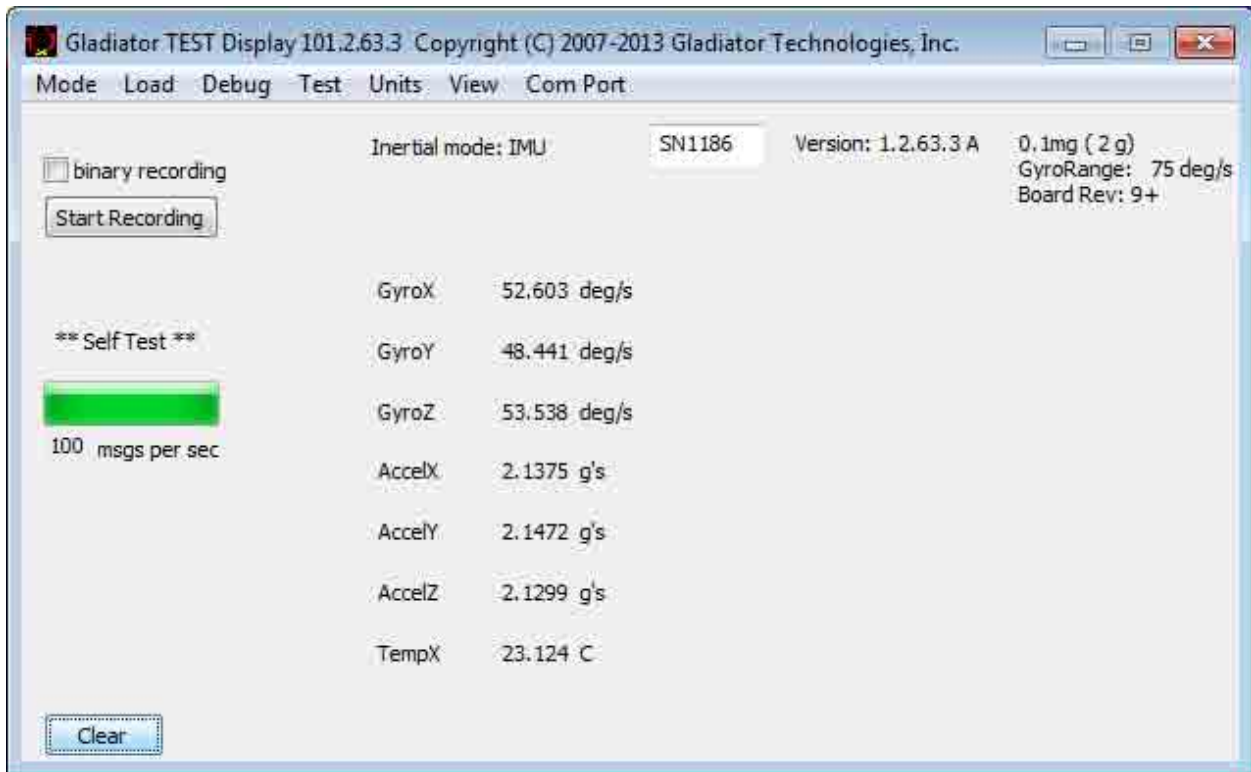
Rev. 14Feb21

SN: 200



Initial Bench Readout (above)

Self Test (below)





Gladiator Technologies

High Performance Inertial MEMS

SN1186 ATP

2/22/2014

LMRK20IMU-075-02-300

Rate Spin Test

Test	gyroX	gyroY	gyroZ	accelX	accelY	accelZ	temp X
PX	3601.263	-0.359	-0.441	-0.183	-2.7163	-3.2026	2315.887
NX	-3598.7	-2.458	-0.514	-0.1815	-0.7779	-3.8662	2316.427
Diff/2	3599.982	1.0495	0.0365	-0.00075	-0.9692	0.3318	-0.27
Ave	1.2815	-1.4085	-0.4775	-0.18225	-1.7471	-3.5344	2316.157
PY	-1.834	3600.465	-1.4	0.2403	0.3726	-3.2764	2312.186
NY	-0.394	-3599.6	-1.363	-1.8347	0.4608	-3.9742	2312.266
Diff/2	-0.72	3600.033	-0.0185	1.0375	-0.0441	0.3489	-0.04
Ave	-1.114	0.4325	-1.3815	-0.7972	0.4167	-3.6253	2312.226
PZ	-1.374	-0.82	3596.654	-2.6057	-2.3611	1.0911	2302.718
NZ	-1.943	-1.676	-3604.147	-0.582	-3.1908	1.0335	2303.173
Diff/2	0.2845	0.428	3600.401	-1.01185	0.41485	0.0288	-0.2275
Ave	-1.6585	-1.248	-3.7465	-1.59385	-2.77595	1.0623	2302.946
RSF Norm	0.999995	1.000009	1.000111				Temp °C 23.10

Gyro Mis-Align deg/sec	Input Rate			
x		-0.01	0.00	x
y	0.01		0.00	y
z	0.00	0.00		z

Gyro Mis-align mrad	Input Rate			
x		-0.20	0.08	x
y	0.29		0.12	y
z	0.01	-0.01		z

Accepted by:



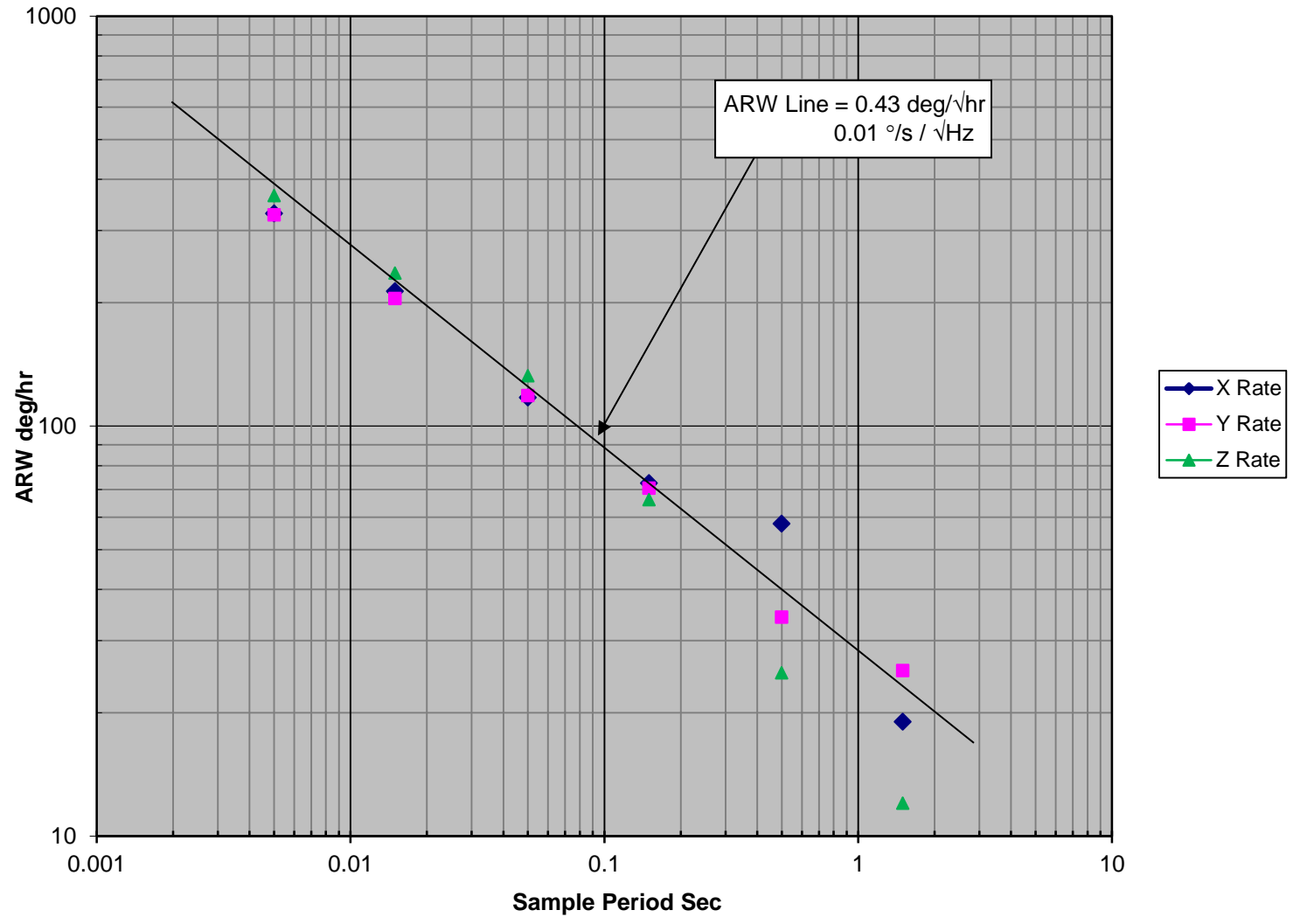


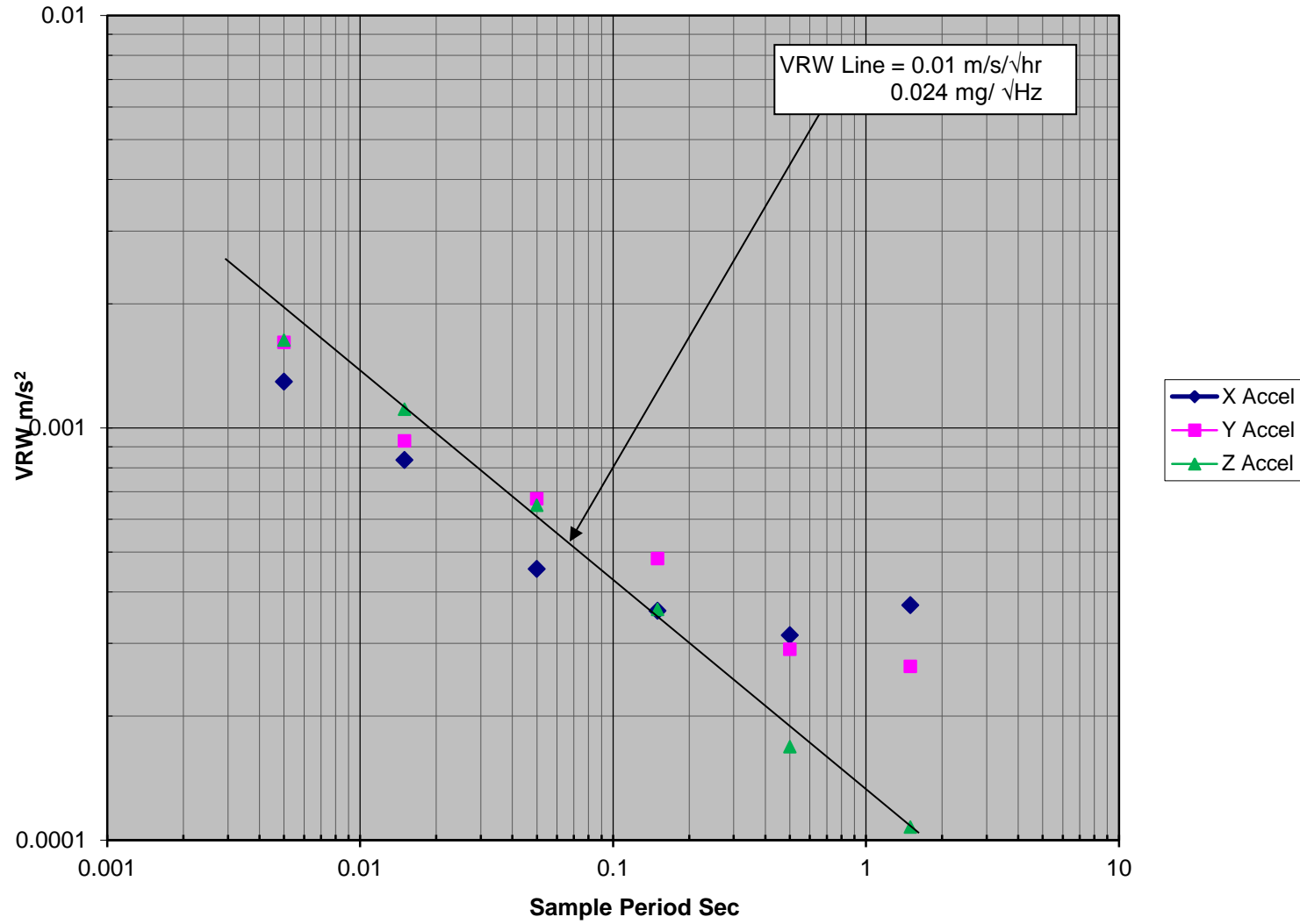
LMRK20IMU-075-02-300
 Accelerometer Tumble Test

Test	gyroX	gyroY	gyroZ	accelX	accelY	accelZ	temp X
PX	-1.027	0.05	-1.027	999.9526	0.4447	-0.4713	2309.597
NX	-0.787	-0.256	-0.318	-999.8845	0.344	-0.1448	2308.07
Diff/2	-0.12	0.153	-0.3545	999.9186	0.05035	-0.16325	0.7635
Ave	-0.907	-0.103	-0.6725	0.03405	0.39435	-0.30805	2308.834
PY	-0.425	-1.049	-1.264	-0.1269	999.7855	0.6419	2311.61
NY	0.361	-1.349	-1.014	0.5235	-1000.033	-0.4866	2312.869
Diff/2	-0.393	0.15	-0.125	-0.3252	999.9093	0.56425	-0.6295
Ave	-0.032	-1.199	-1.139	0.1983	-0.1238	0.07765	2312.24
PZ	-0.778	-1.1	-1.021	-0.2141	-1.031	999.7721	2311.743
NZ	0.422	-0.969	-0.764	-0.2174	0.0252	-1000.111	2320.359
Diff/2	-0.6	-0.0655	-0.1285	0.00165	-0.5281	999.9415	-4.308
Ave	-0.178	-1.0345	-0.8925	-0.21575	-0.5029	-0.16945	2316.051
Bias %/s,mg	-0.004	-0.008	-0.009	-0.01	-0.05	-0.12	23.12
ASF Norm				0.9999	0.9999	0.9999	Temp °C

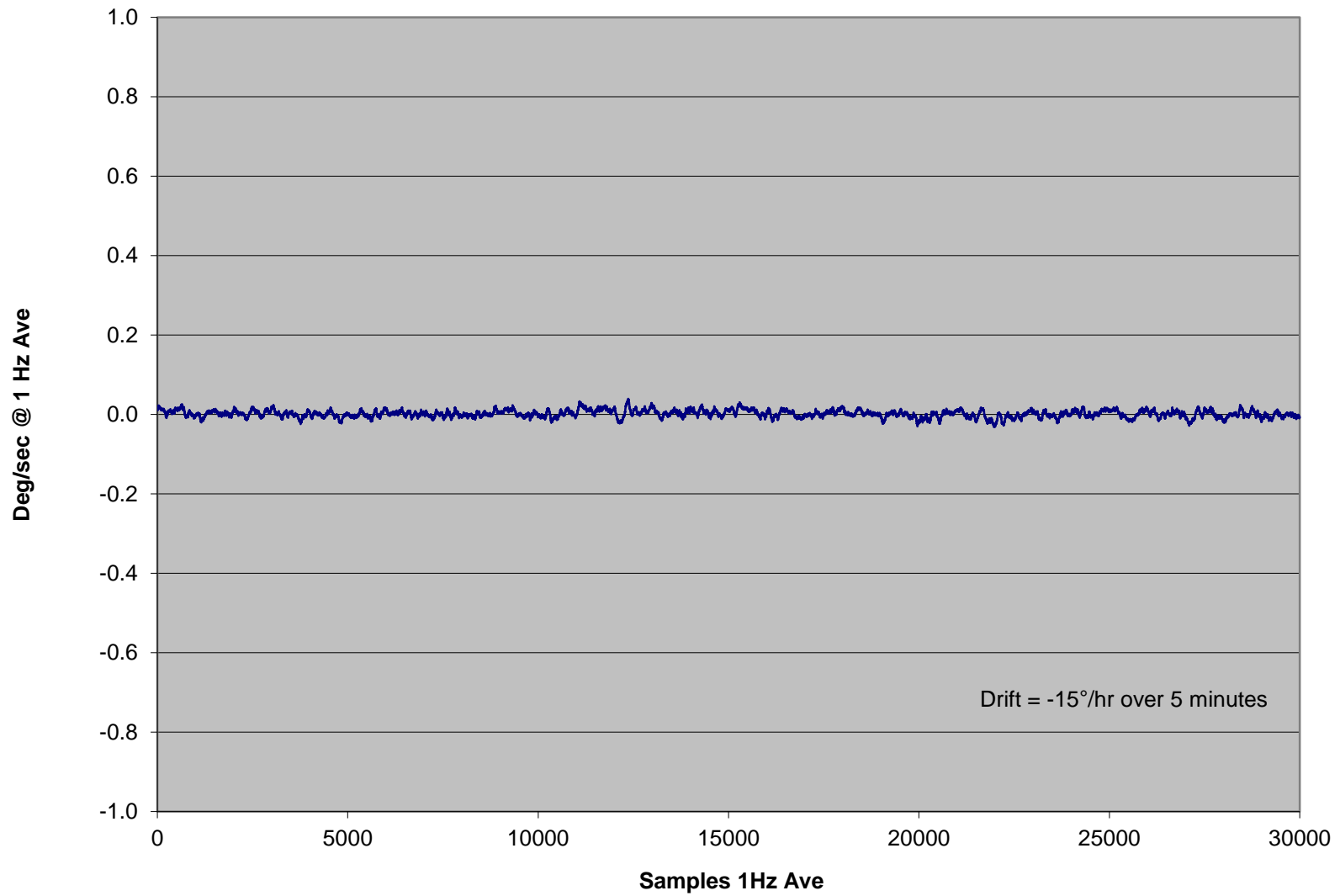
Gyro %/s /g	Input g =			Accel In g's
x	-0.001	-0.004	-0.006	x
y	0.002	0.002	-0.001	y
z	-0.004	-0.001	-0.001	z

Accel		Accel In
Mis-Align	mrads	
-0.33	0.00	x
0.05	-0.53	y
-0.16	0.56	z

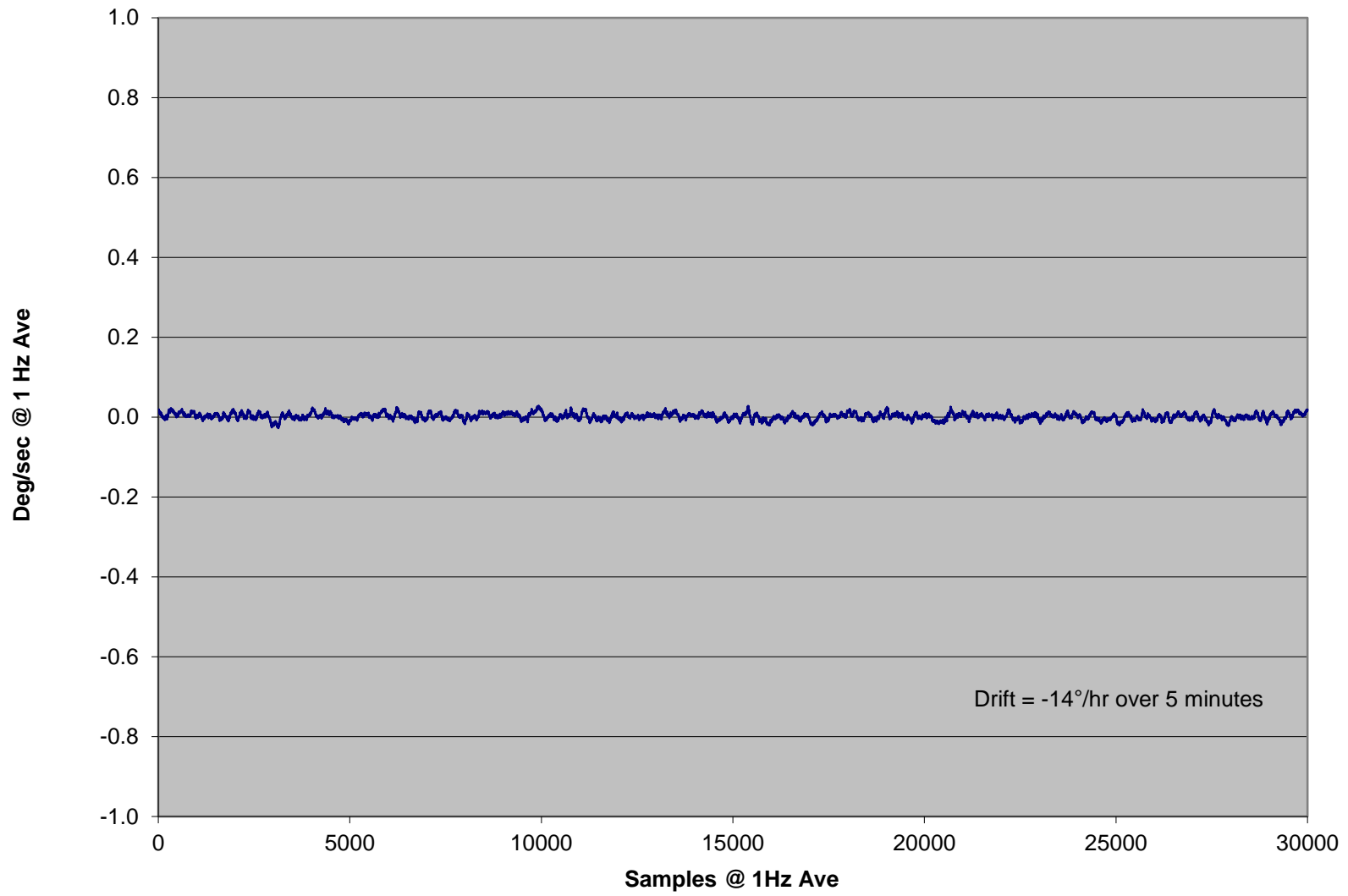




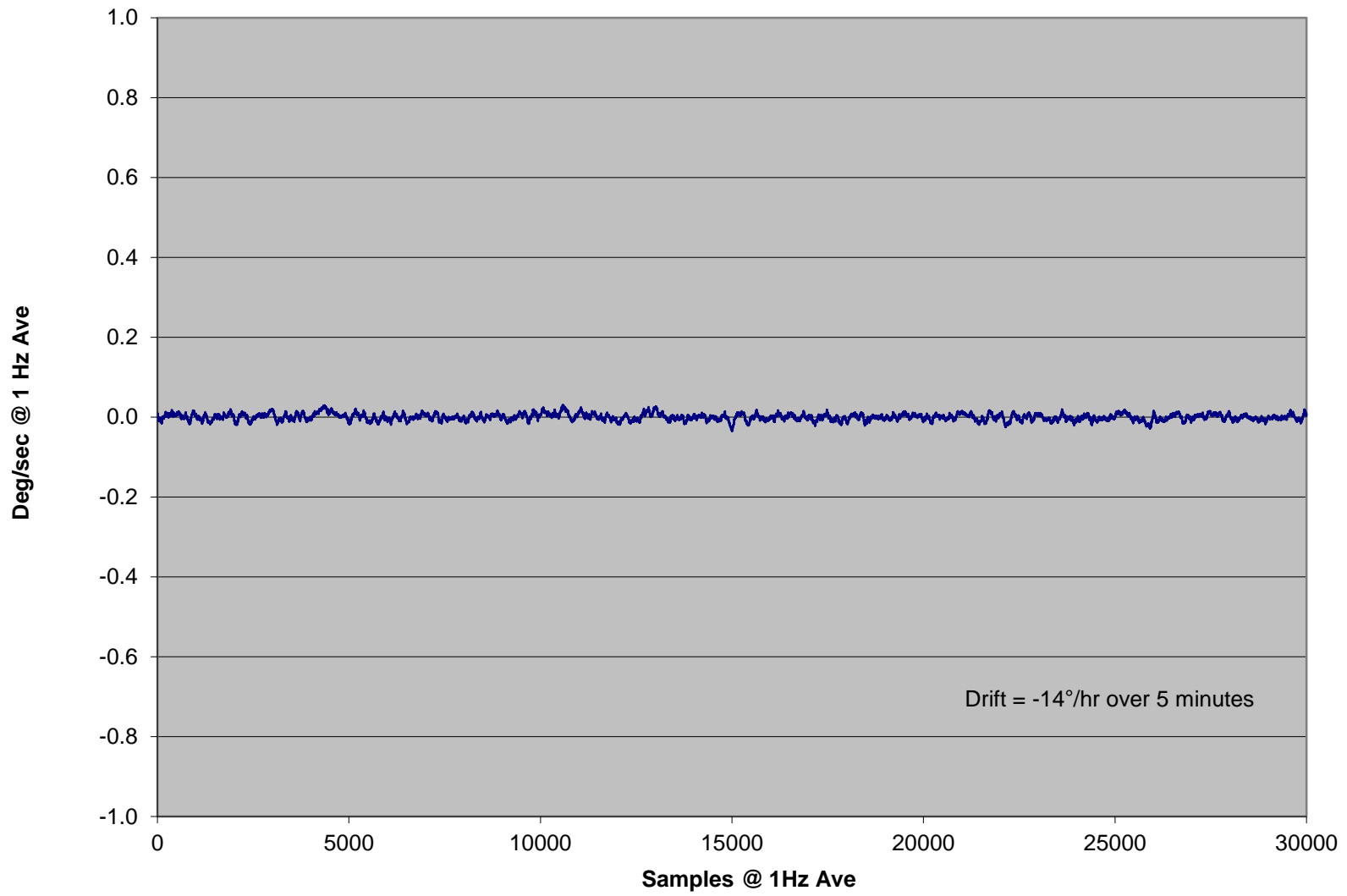
X Gyro In-Run Bias



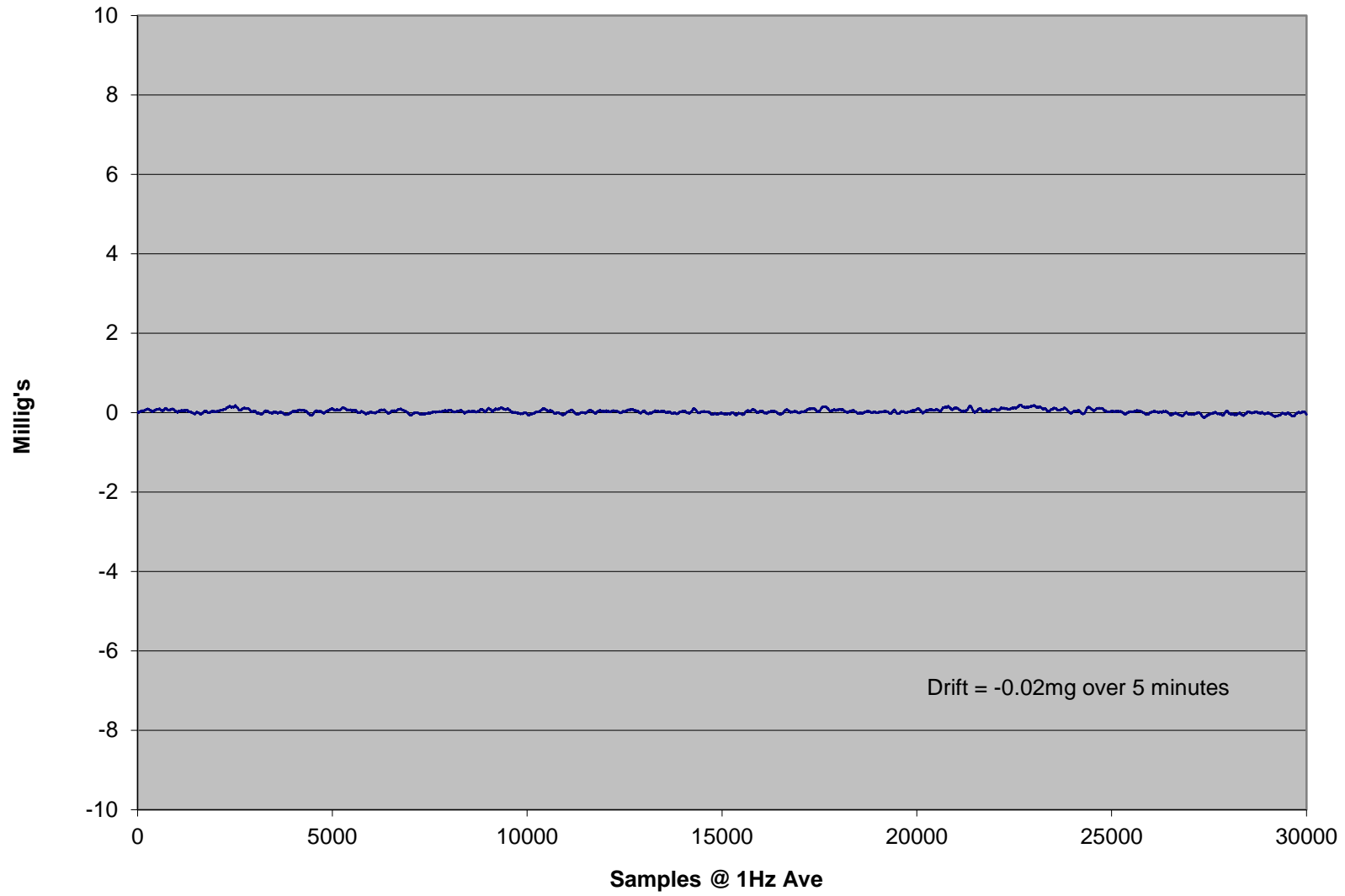
Y Gyro In-Run Bias



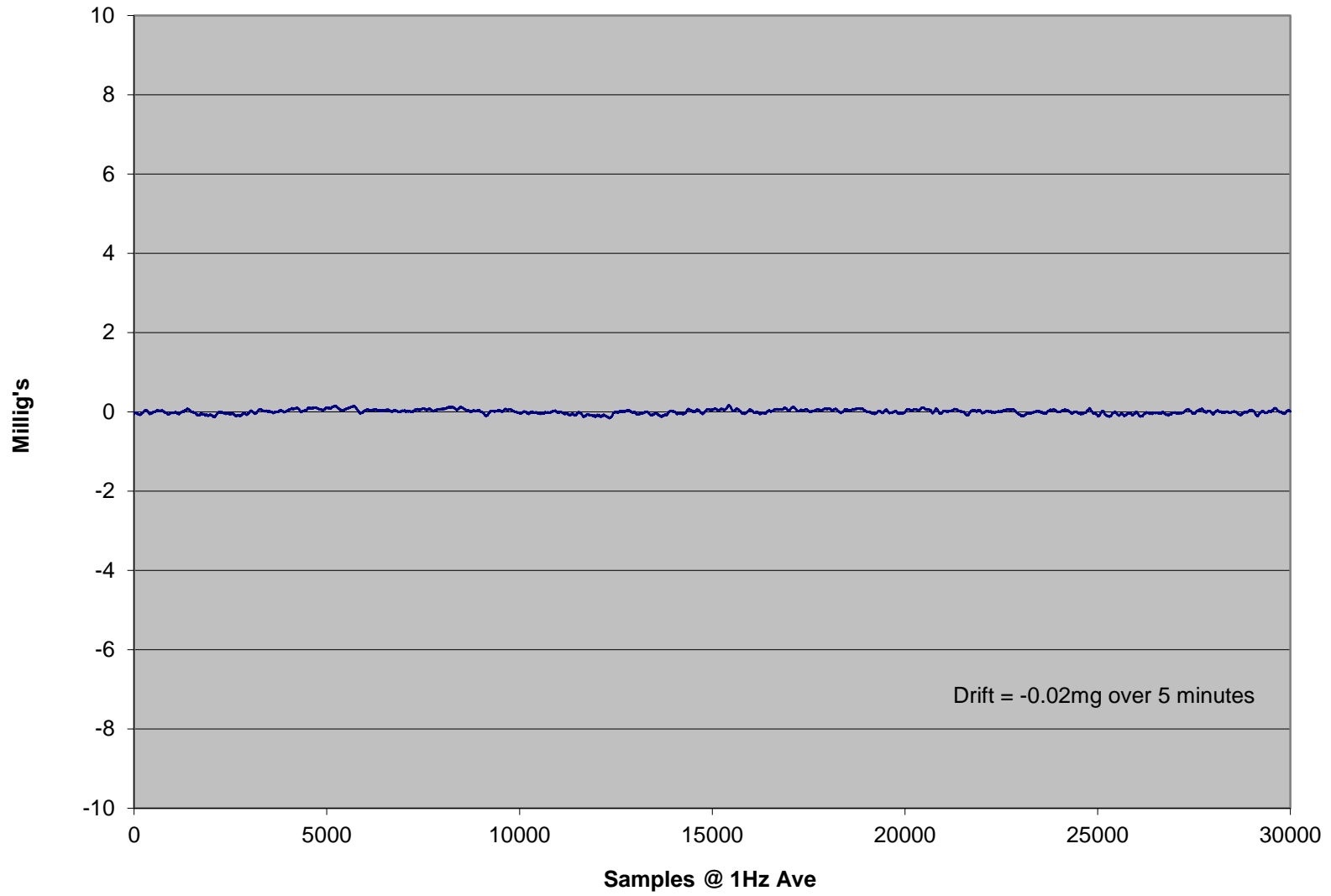
Z Gyro In-Run Bias



X Accel In-Run



Y Accel In-Run



Z Accel In-Run

