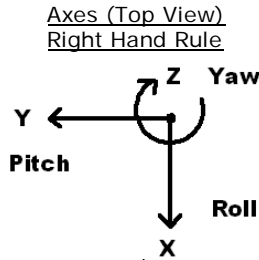
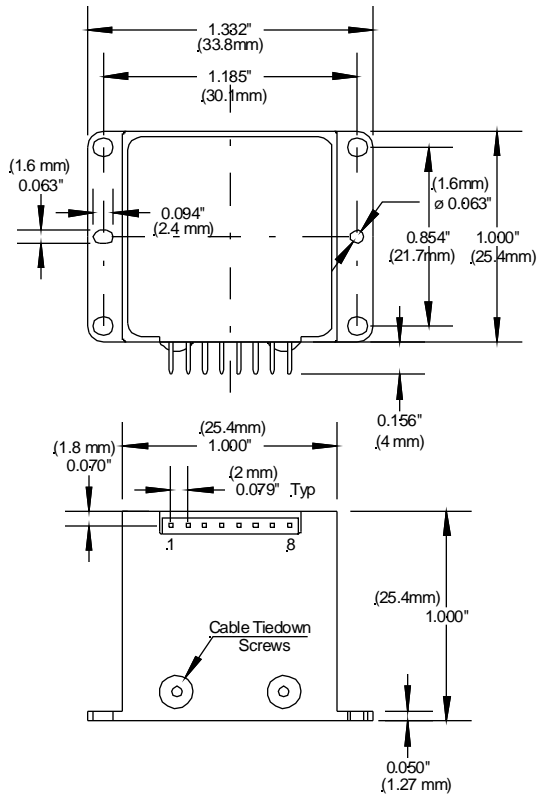


# LandMark™ 21 IMU



LandMark™ 21 IMU	
LMRK21IMU-100-06-300 or -10	LMRK21IMU-300-06-300 or -10

## Specification

PARAMETER	RATE AXES		ACCEL AXES	
	Range	±100°/sec	±300°/sec	±6 g's
Bias (Over Temp.)	< 0.05°/sec 1 σ		< 2mg 1 σ	
Bias (In Run Stability)	10°/hour 1 σ		0.1mg 1 σ	
Scale Factor Error %	≤0.1% (over temperature) 1 σ			
Sensor Resolution	0.01°/sec		0.12mg	
Angle Random Walk	0.004° /sec/√Hz 1 σ	0.006° /sec/√Hz 1 σ	0.25mg /√Hz 1 σ	
Alignment	1mrad 1 σ			
G-Sensitivity	< 0.02°/sec/g 1 σ			
Self Test On	NA		Δ 0.6 ±0.3g	
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	<b>+3.1V to +5.5V Max. Input (single sided)</b>			
Power Consumption	230 mW at 3.3V Typical 250 mW at 3.3V Maximum			
Size	U.S.: Metric:	1.0 x 1.0 x 1.0 = 1.0 in <sup>3</sup> 2.54 x 2.54 x 2.54 = 16.4 cm <sup>3</sup>		
Weight	28 grams			
Mounting	4ea No.2-56 Screws			
Shock	500g's ½ sine 30 msec powered			
Vibration	6gRMS (20Hz to 2KHz ~ 10g accelerometers)			
MTBF	124,334 hrs (per MIL-STD-217F, Notice 2 and ANSI/VITA 51.1-2008 with environment: ARW at 55°C Ambient)			

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

Note: Any unused inputs (Pins 4, 6, 8) must be connected to signal ground (Pin 7).

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

Rev. 12Oct08  
 SN: 500



**Gladiator Technologies**



High Performance Inertial MEMS

SN517 ATP

1/30/2014

LMRK21IMU-300-10-303

Rate Spin Test

Test	gyroX	gyroY	gyroZ	accelX	accelY	accelZ	temp X
PX	14401.26	-8.269	4.756	0.044	-6.6865	-16.4365	2560.552
NX	-14401.68	-8.266	2.71	0.117	-3.9225	-16.492	2558.149
Diff/2	14401.47	-0.0015	1.023	-0.0365	-1.382	0.02775	1.2015
Ave	-0.21	-8.2675	3.733	0.0805	-5.3045	-16.46425	2559.351
PY	-10.993	14402.75	2.99	0.3285	0.3575	-17.206	2576.152
NY	-13.292	-14396.95	2.742	-2.685	0.3995	-16.6945	2573.282
Diff/2	1.1495	14399.85	0.124	1.50675	-0.021	-0.25575	1.435
Ave	-12.1425	2.8995	2.866	-1.17825	0.3785	-16.95025	2574.717
PZ	-14.365	-8.394	14399.18	-0.7695	-5.3055	0.735	2589.819
NZ	-12.366	-6.867	-14402.08	-0.607	-5.0835	0.7985	2587.407
Diff/2	-0.9995	-0.7635	14400.63	-0.08125	-0.111	-0.03175	1.206
Ave	-13.3655	-7.6305	-1.4495	-0.68825	-5.1945	0.76675	2588.613
RSF Norm	1.000102	0.99999	1.000043				Temp °C 25.74

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

Gyro Mis-align mrad	Input Rate			
x		0.08	-0.07	x
y	0.00		-0.05	y
z	0.07	0.01		z

Accepted by:





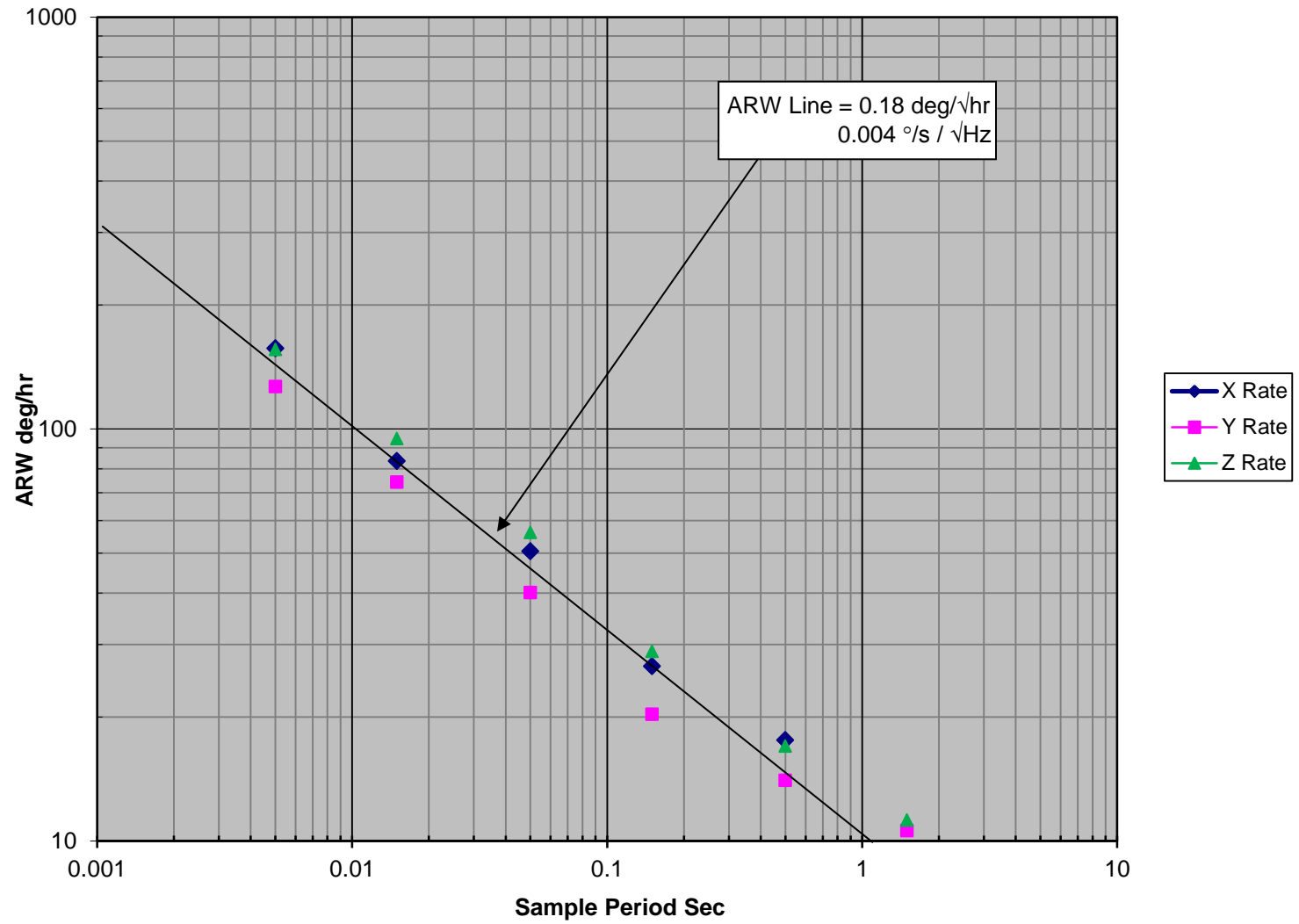
LMRK21IMU-300-10-303  
Accelerometer Tumble Test

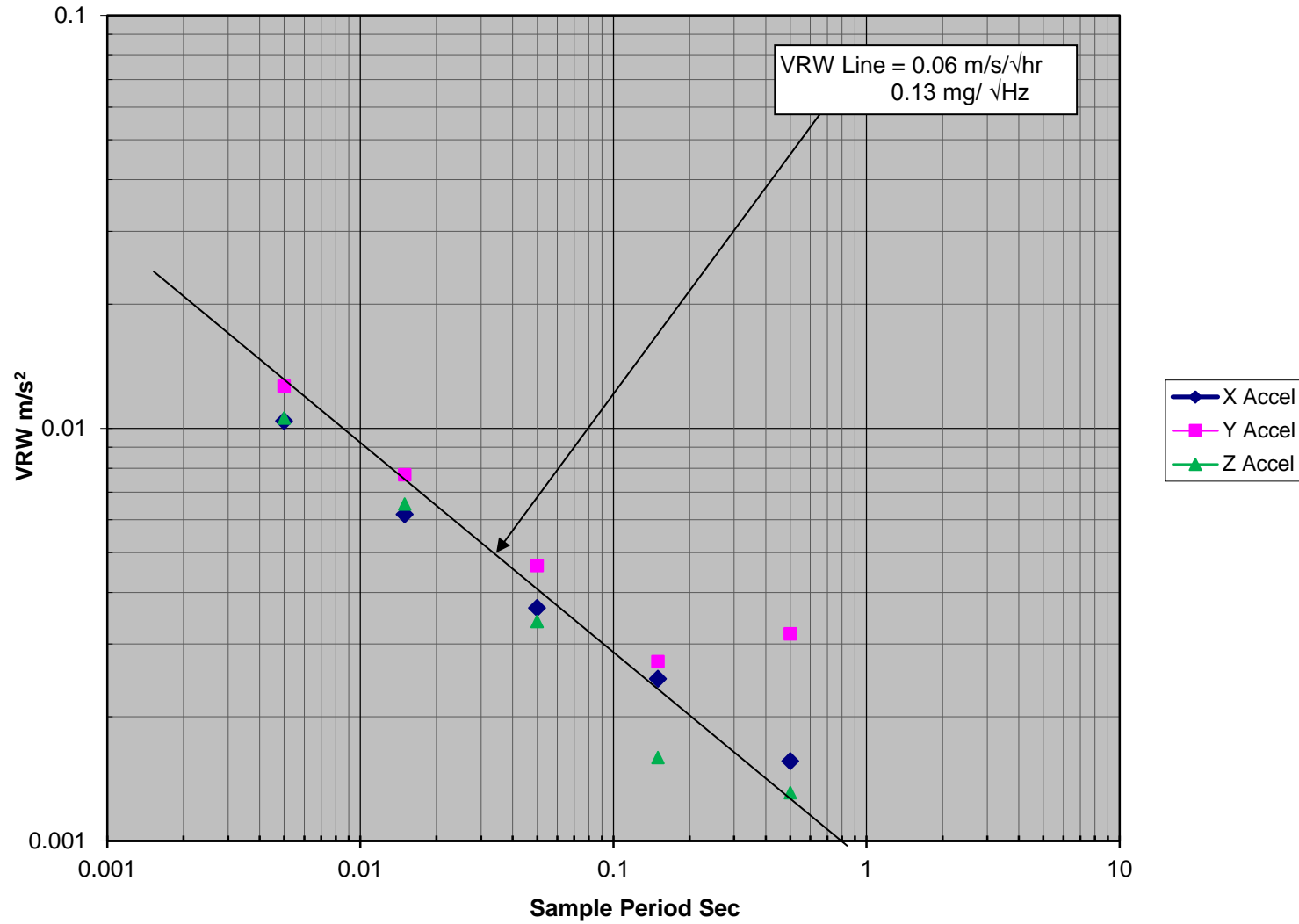
Test	gyroX	gyroY	gyroZ	accelX	accelY	accelZ	temp X
PX	0.087	-0.613	0.556	998.5835	-0.035	-0.2455	2578.954
NX	0.151	-0.227	0.242	-1001.409	0.2145	-1.405	2580.496
Diff/2	-0.032	-0.193	0.157	999.996	-0.12475	0.57975	-0.771
Ave	0.119	-0.42	0.399	-1.4125	0.08975	-0.82525	2579.725
PY	0.13	-0.65	0.28	-0.025	1000.583	-0.264	2565.347
NY	-0.031	-0.584	0.388	-0.2525	-999.2445	-0.223	2562.793
Diff/2	0.0805	-0.033	-0.054	0.11375	999.9138	-0.0205	1.277
Ave	0.0495	-0.617	0.334	-0.13875	0.66925	-0.2435	2564.07
PZ	0.089	-0.489	0.161	-0.219	-0.5485	999.791	2564.979
NZ	0.003	-0.51	0.173	0.091	-1.008	-1000.15	2567.229
Diff/2	0.043	0.0105	-0.006	-0.155	0.22975	999.9705	-1.125
Ave	0.046	-0.4995	0.167	-0.064	-0.77825	-0.1795	2566.104
Bias %s,mg	0.001	-0.005	0.003	-0.10	-0.34	-0.53	25.70
ASF Norm				1.0000	0.9999	1.0000	Temp °C

Gyro %s /g	Input g =			Accel In g's
x	0.000	0.001	0.000	x
y	-0.002	0.000	0.000	y
z	0.002	-0.001	0.000	z

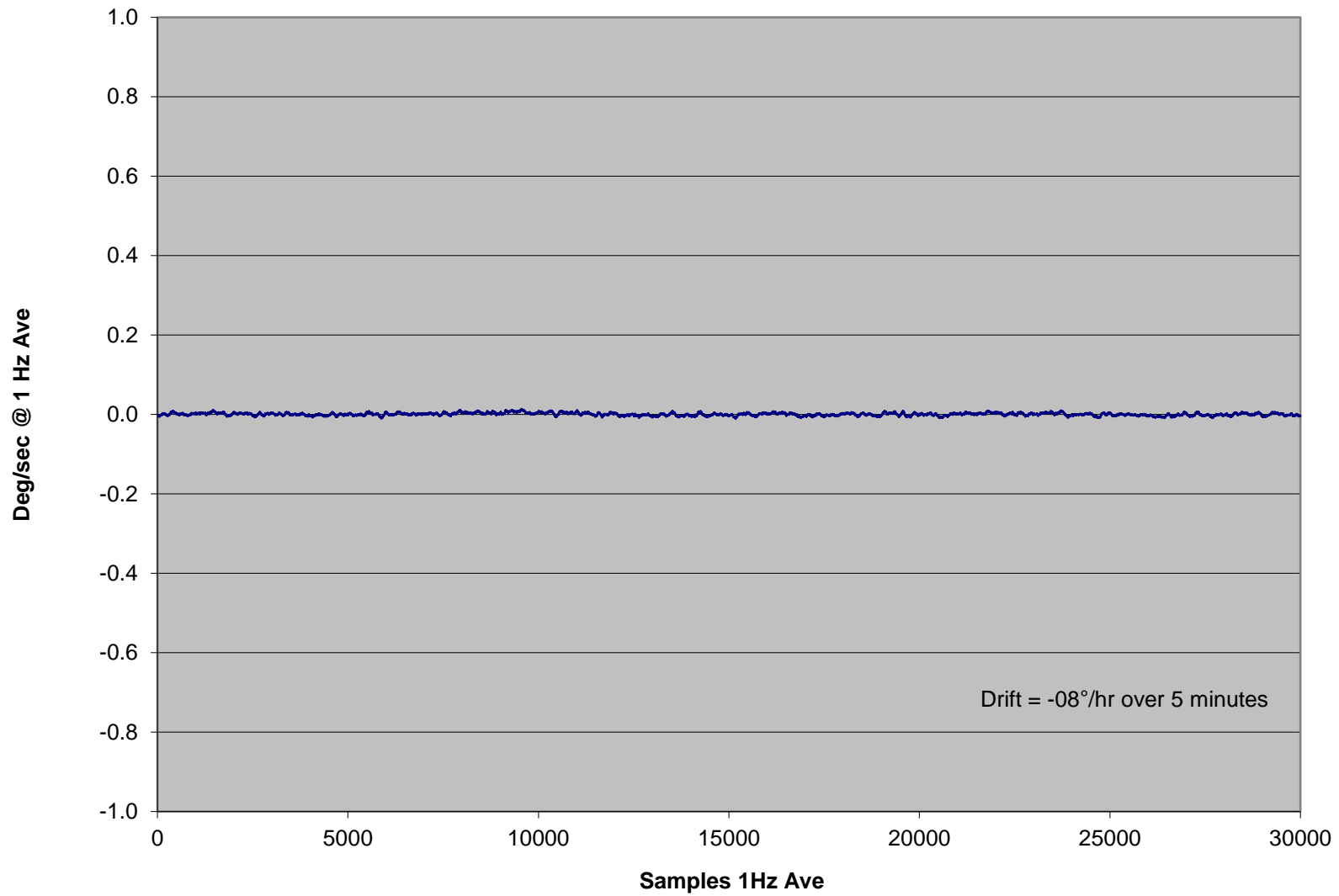
Accel		Accel In
Mis-Align	mrads	
0.11	-0.16	x
-0.12	0.23	y
0.58	-0.02	z

Accepted by:

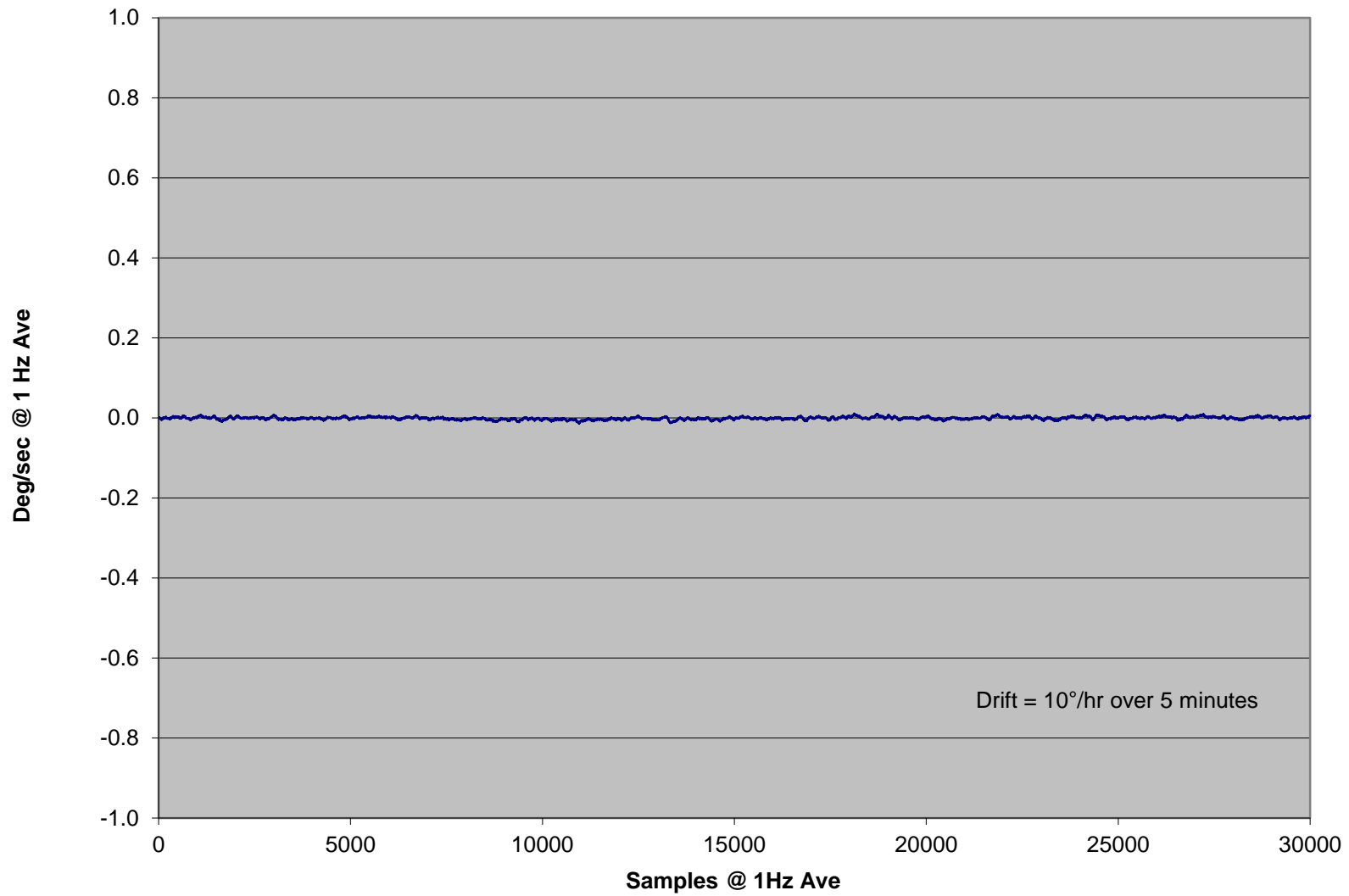




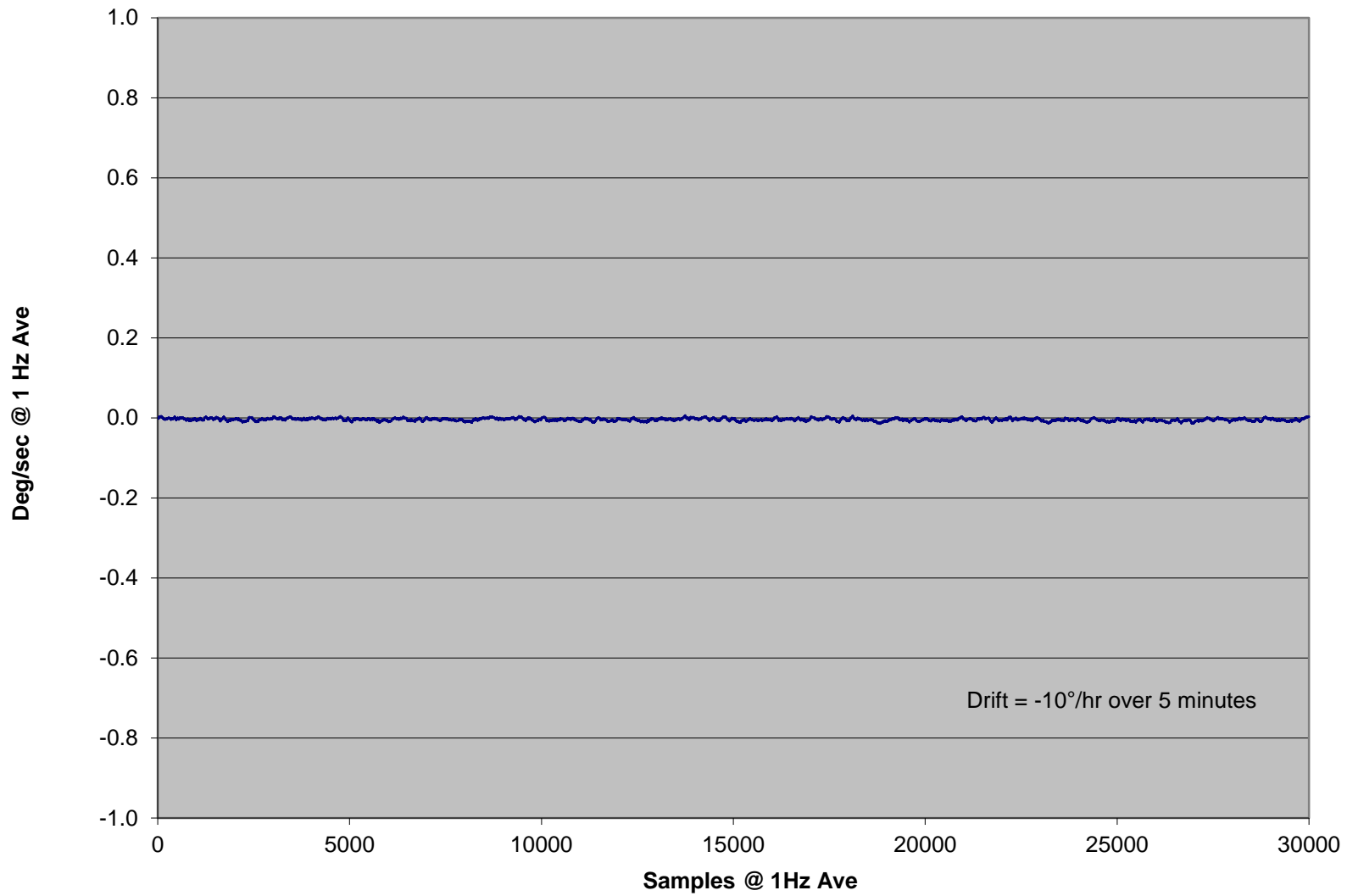
### X Gyro In-Run Bias



### Y Gyro In-Run Bias

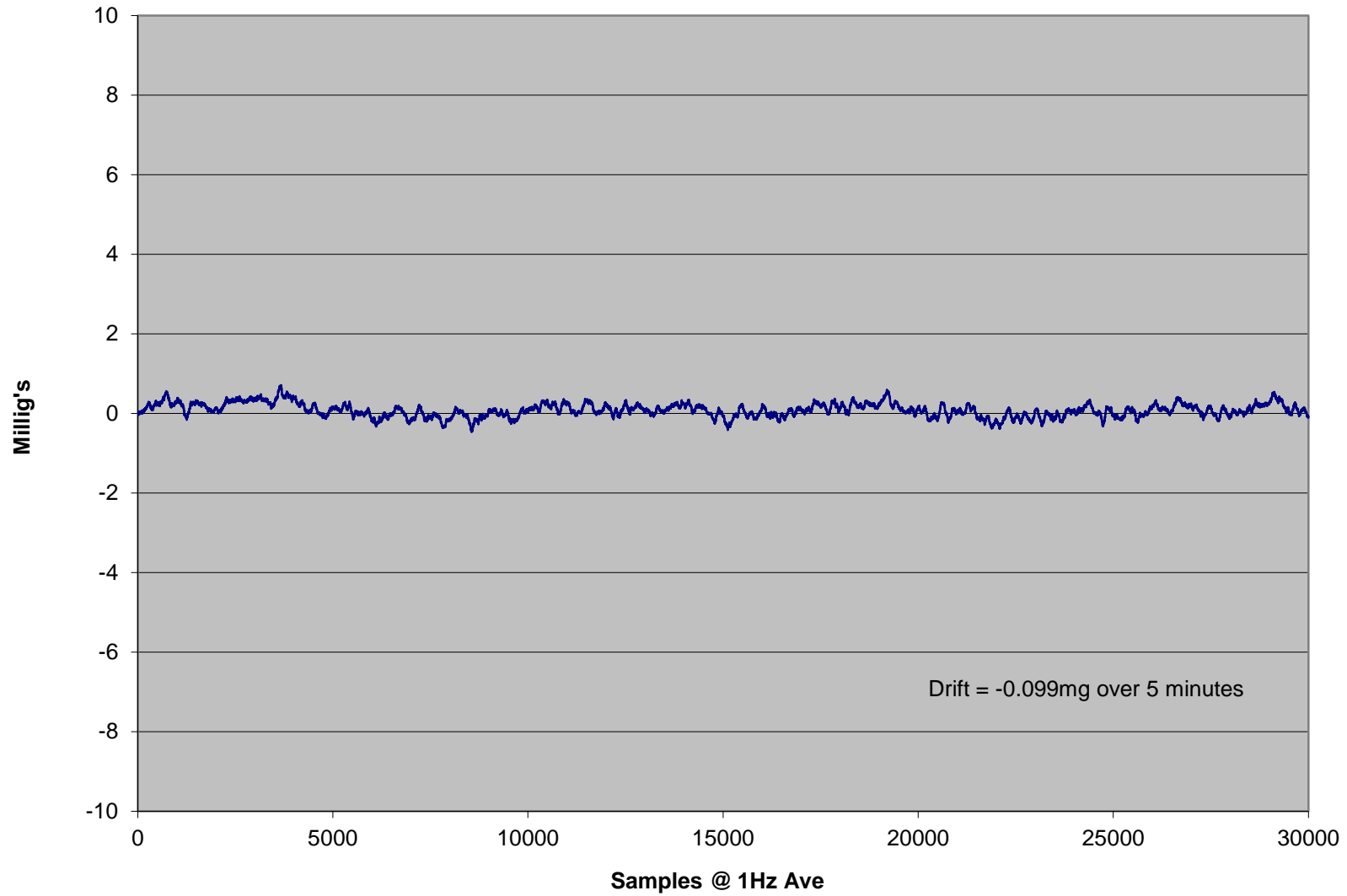


### Z Gyro In-Run Bias

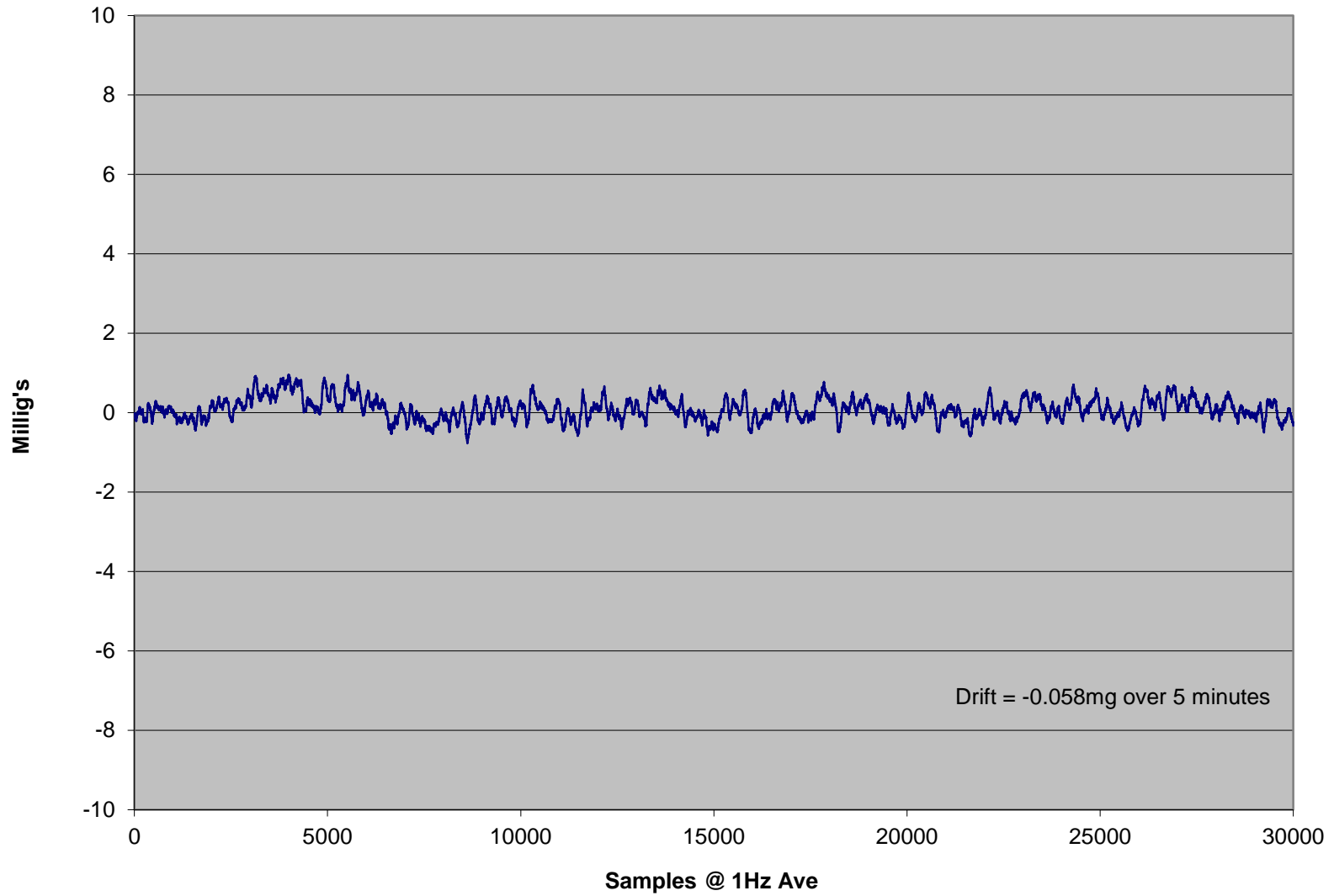




### X Accel In-Run



### Y Accel In-Run



### Z Accel In-Run

