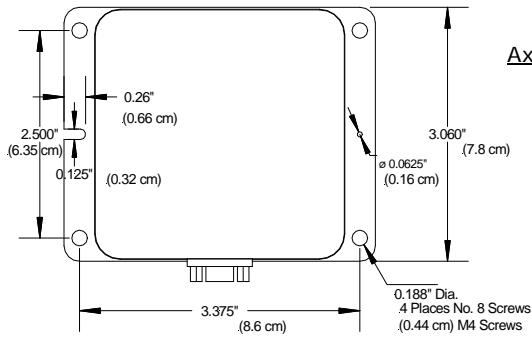
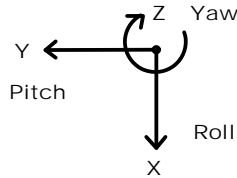


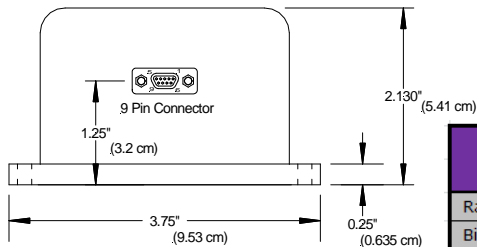
# LandMark™ 50 Vertical Gyro (VG)



Axes (Top View) Right Hand Rule



Standard LandMark™ 50 VG	
LMRK50VG-075-02-100 or -06 or -10	
LMRK50VG-100-02-100 or -06 or -10	
LMRK50VG-175-02-100 or -06 or -10	
LMRK50VG-300-02-100 or -06 or -10	



Mating Connector: M83513/01-AN

## Specification

Pin No.	Assignment
1	RS-485 A (+)
2	RS-485 B (-)
3	Power Ground
4	Analog/Digital Input (0V to 5V)
5	<b>+6.0V to +36V Input Power</b>
6	External Sync Input (1kHz)
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 100Hz
1, 2, 3	Gyros: Roll (X), Pitch (Y), Yaw (Z)
4, 5, 6	Accelerometers: (X), (Y), (Z)
7	IMU Temperature
8, 9, 10	No Magnetometers: (X), (Y), (Z)
11	No Pressure
12, 13, 14	Angles: Roll, Pitch, No Yaw
15, 16, 17	AC Velocities: (X), (Y) & No (Z)
18, 19	No Altitude, No Temp
20	Forward Velocity (As Input)

PARAMETER	LandMark™ 50 VG						
	RATE AXES				ACCEL AXES		
Range	±75°/s	±100°/s	±175°/s	±300°/s	±2 g's	±6 g's	±10 g's
Bias (Over Temp.) 1 σ	<0.01°/sec		<0.02°/sec		<1.0mg	<1.3mg	<1.5mg
Bias (In Run Stability) 1σ	1.2°/hour		1.8°/hour		0.02mg	0.04mg	0.05mg
Scale Factor Error %	≤0.05% (over temperature)						
Non-Linearity % of FS	<0.1	<0.5	<1	<2	<0.025	<0.05	
Resolution	0.0005°/sec		0.001°/sec		0.02mg	0.05mg	0.06mg
Angle Random Walk	0.001°		0.0012°	0.0015°	0.025	0.065	0.075
			/sec/√Hz 1 σ		mg/√Hz 1 σ		
Pitch & Roll	< ± 0.1° typical						
Alignment	0.5 mrad 1 σ						
G-Sensitivity	<0.002°/sec/g typical 1 σ						
Self Test On	N/A				Δ 1.0 ±0.5g	Δ 0.35 ±0.25g	Δ 0.35 ±0.25g
	Logic 1 = 3V to 5V at Pin 9						
Temp Range	Operating: -40°C to +85°C						
	Non-Operating: -55°C to +100°C						
Update Rate	200 Hz, 100 Hz, or 10 Hz (user selectable)						
Temp Sensors	6 Internal Temperature Sensors						
Start-up Time	< 0.65 sec at 200 Hz						
Input Power	<b>+6.0V to +36V Max. Input (single sided)</b> <b>(Input Transient Protection to 80V)</b>						
Power Consumption	640 mW at +12V typical 730 mW at +12V maximum						
Size	U.S.:	3.0 x 3.06 x 2.13 = 19.6 in <sup>3</sup>					
	Metric:	7.62 x 7.8 x 5.4 = 321cm <sup>3</sup>					
Weight	<380 grams						
Mounting	4ea No.8 or M4 Screws						
Shock	500g's ½ sine 2 msec powered						
Vibration	6 gRMS (20Hz - 2KHz ~ 10g accelerometers)						
MTBF	37,100 hrs (per MIL-STD-217F, Notice 2 based on AIC environment with ambient temperature at 40°C)						

User to provide either analog or external velocity for velocity functions to be enabled (pin 4).

Specification subject to change without notice

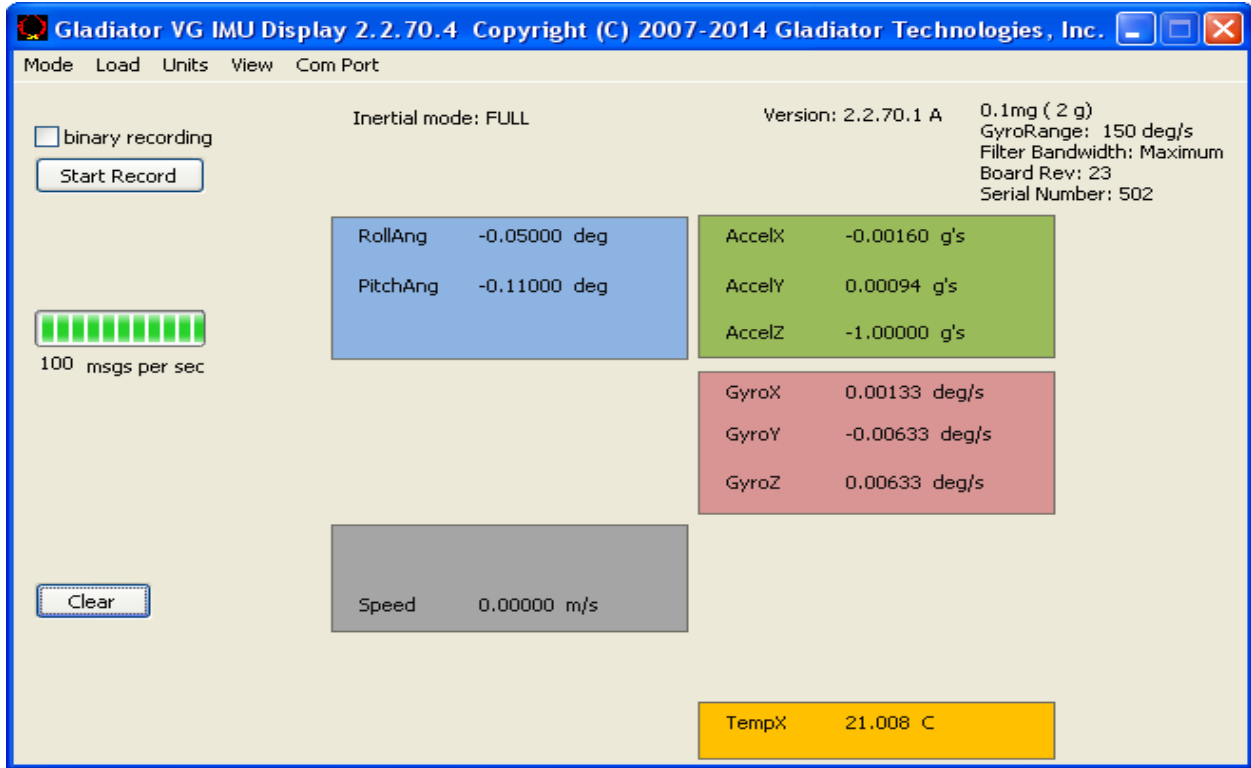


**Gladiator Technologies**  
High Performance Inertial MEMS

**Gladiator Technologies, Inc.**

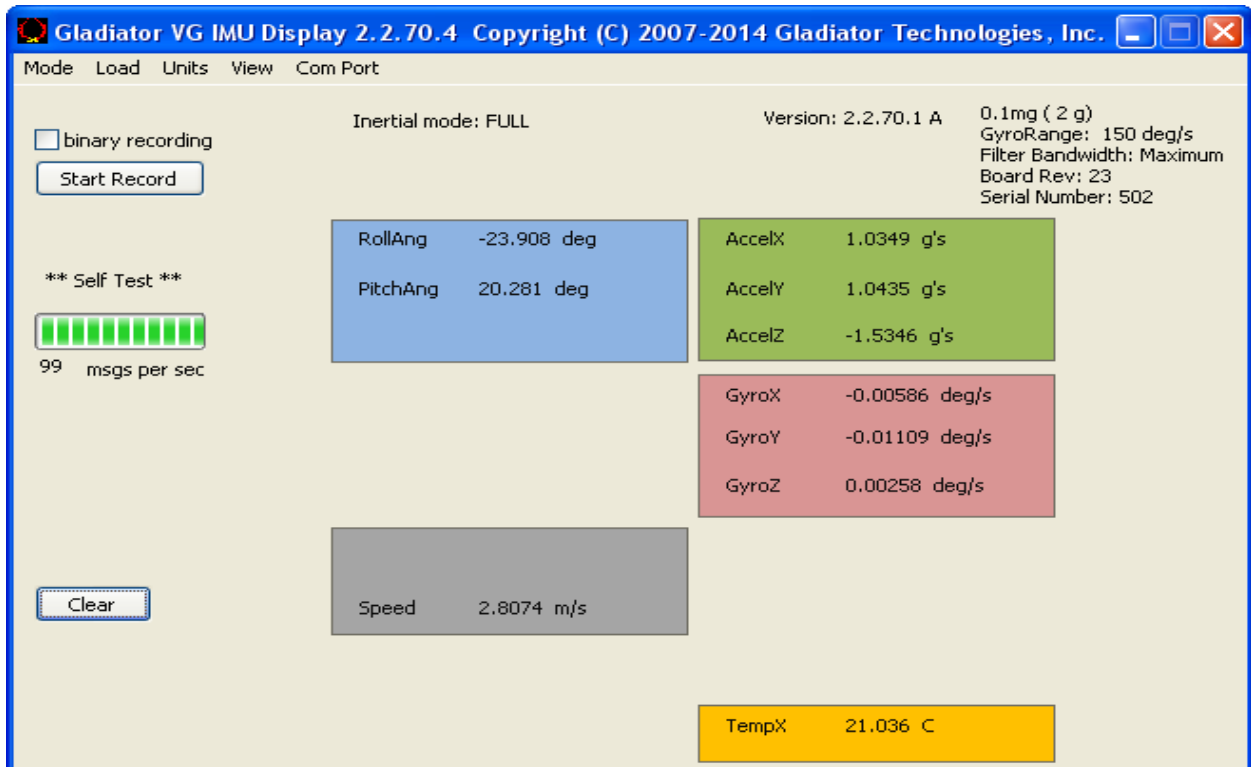
8022 Bracken Place SE  
Snoqualmie, WA 98065 USA  
Tel: 425.396.0829 Fax: 425.396.1129  
Email: [sales@gladiatortechnologies.com](mailto:sales@gladiatortechnologies.com)  
Web: [www.gladiatortechnologies.com](http://www.gladiatortechnologies.com)

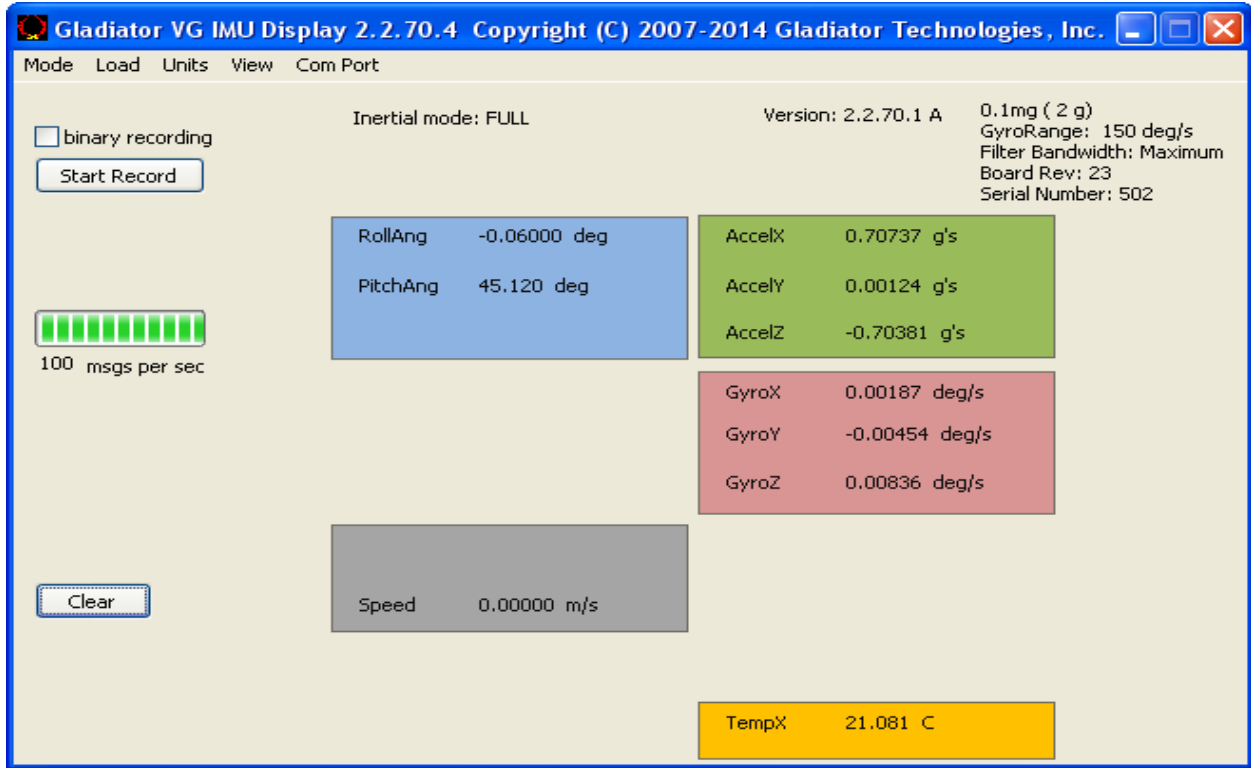
Rev. 14Jan10  
SN: 150



Initial Bench Readout (above)

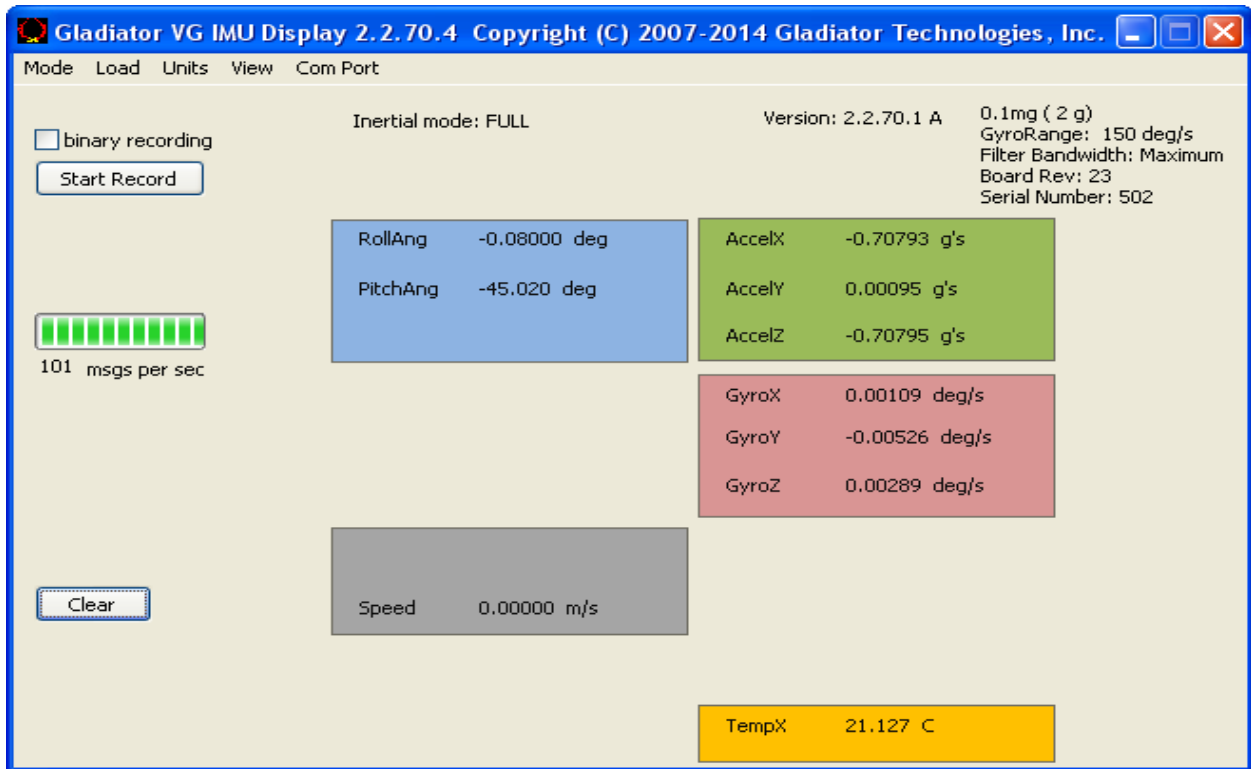
Self Test (below)

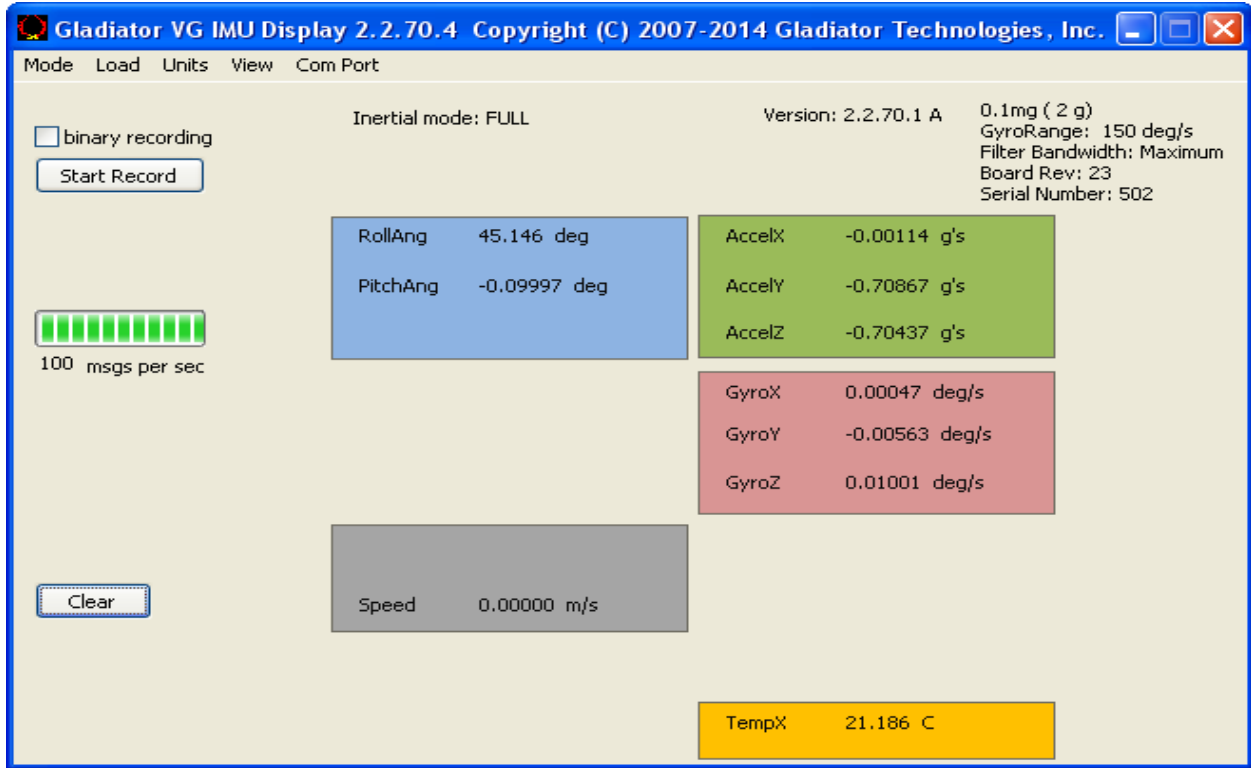




Pitch Up 45° (above)

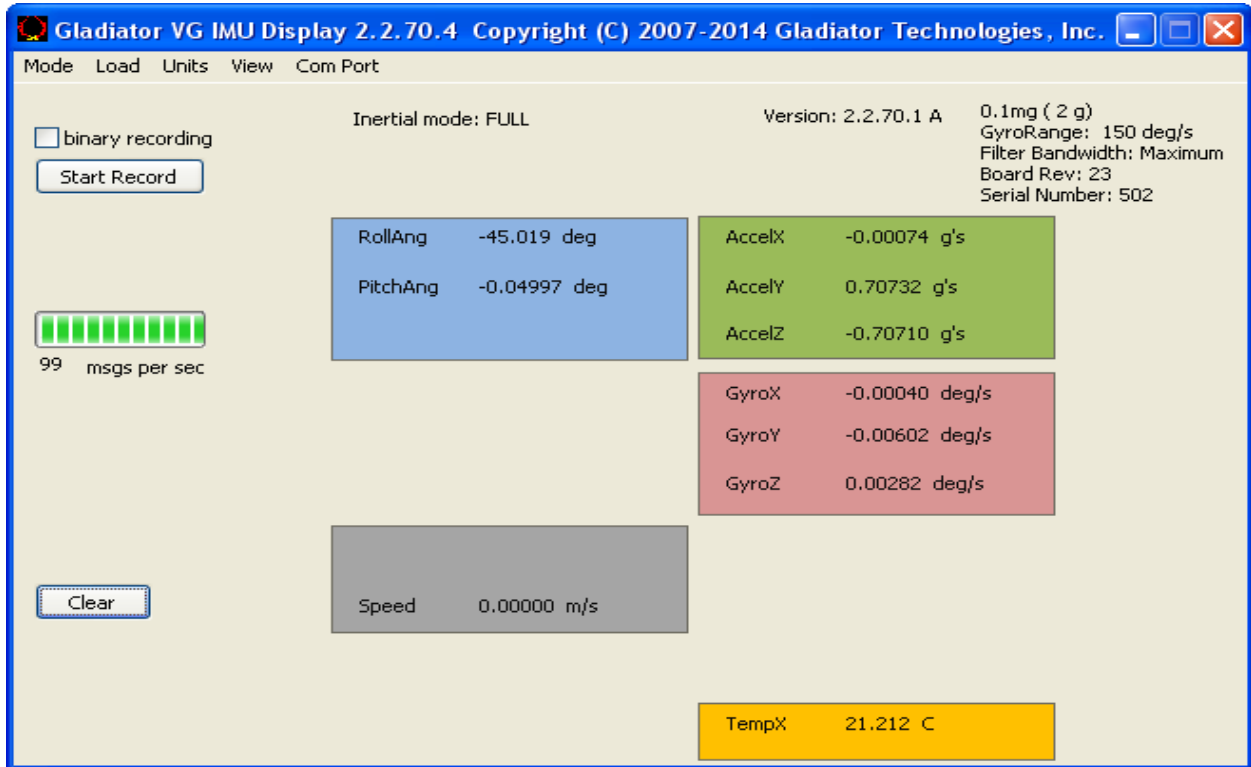
Pitch Down 45° (below)





Roll 45° (above)

Roll -45° (below)





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High Performance Inertial MEMS

# SN502 ATP

4/18/2014

LMRK50VG-100-02-100

Rate Spin Test

Test	gyroX	gyroY	gyroZ	accelX	accelY	accelZ	temp X
PX	7199.155	-2.014	0.655	-0.132	-0.5866	-3.2133	2554.707
NX	-7200.226	-3.93	-0.17	-0.1066	0.2905	-2.1996	2554.464
Diff/2	7199.691	0.958	0.4125	-0.0127	-0.43855	-0.50685	0.1215
Ave	-0.5355	-2.972	0.2425	-0.1193	-0.14805	-2.70645	2554.586
PY	-3.3	7199.693	0.193	-1.0461	0.9566	-3.0818	2545.728
NY	-2.239	-7200.771	-0.123	-1.8946	0.9393	-2.2491	2546.542
Diff/2	-0.5305	7200.232	0.158	0.42425	0.00865	-0.41635	-0.407
Ave	-2.7695	-0.539	0.035	-1.47035	0.94795	-2.66545	2546.135
PZ	-3.293	-3.074	7199.577	-2.8373	-1.2777	1.9539	2534.2
NZ	-2.102	-2.924	-7200.335	-2.1076	-0.3554	1.8968	2534.142
Diff/2	-0.5955	-0.075	7199.956	-0.36485	-0.46115	0.02855	0.029
Ave	-2.6975	-2.999	-0.379	-2.47245	-0.81655	1.92535	2534.171
RSF Norm	0.999957	1.000032	0.999994				Temp °C 25.45

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

Gyro Mis-align mrad				Input Rate
x		-0.07	-0.08	x
y	0.13		-0.01	y
z	0.06	0.02		z

Accepted by:





**Gladiator Technologies**

High Performance Inertial MEMS

SN502 ATP

4/18/2014

LMRK50VG-100-02-100  
Accelerometer Tumble Test

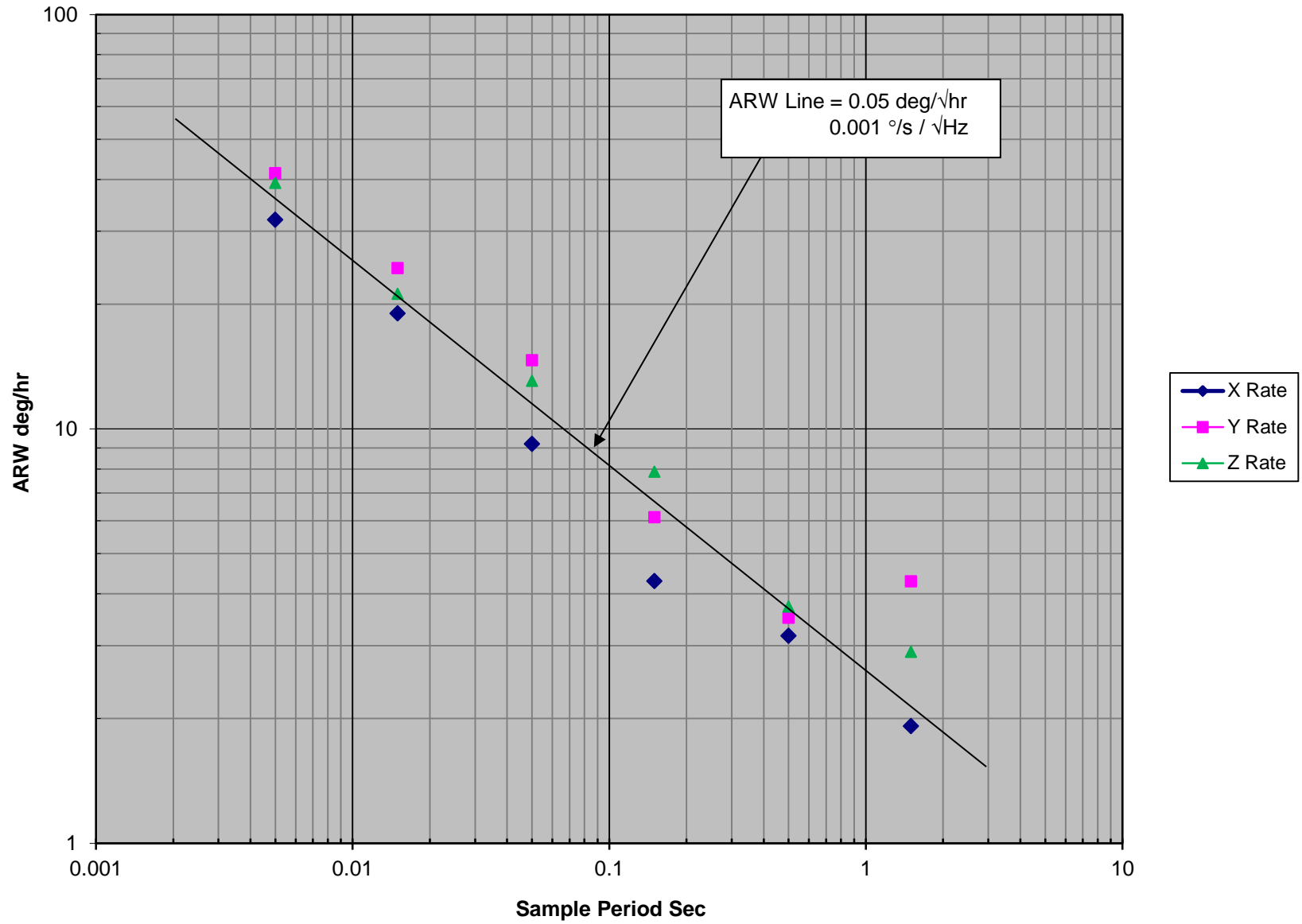
Test	gyroX	gyroY	gyroZ	accelX	accelY	accelZ	temp X
PX	-0.305	-0.269	0.289	999.9896	0.9862	-0.2205	2545.262
NX	-0.222	-0.262	-0.113	-1000.044	0.8993	0.1241	2544.163
Diff/2	-0.0415	-0.0035	0.201	1000.017	0.04345	-0.1723	0.5495
Ave	-0.2635	-0.2655	0.088	-0.0273	0.94275	-0.0482	2544.713
PY	-0.126	-0.26	-0.069	-0.2664	1000.038	0.6871	2551.924
NY	-0.262	-0.244	0.075	-0.0444	-999.9244	-0.5881	2554.283
Diff/2	0.068	-0.008	-0.072	-0.111	999.9814	0.6376	-1.1795
Ave	-0.194	-0.252	0.003	-0.1554	0.05695	0.0495	2553.104
PZ	-0.191	-0.313	0.036	-0.0341	-1.4209	999.9327	2554.511
NZ	-0.122	-0.253	0.03	0.0551	-0.1366	-1000.051	2549.158
Diff/2	-0.0345	-0.03	0.003	-0.0446	-0.64215	999.992	2.6765
Ave	-0.1565	-0.283	0.033	0.0105	-0.77875	-0.05925	2551.835
Bias %s,mg	-0.002	-0.003	0.000	-0.07	0.08	0.00	25.50
ASF Norm				1.0000	1.0000	1.0000	Temp °C

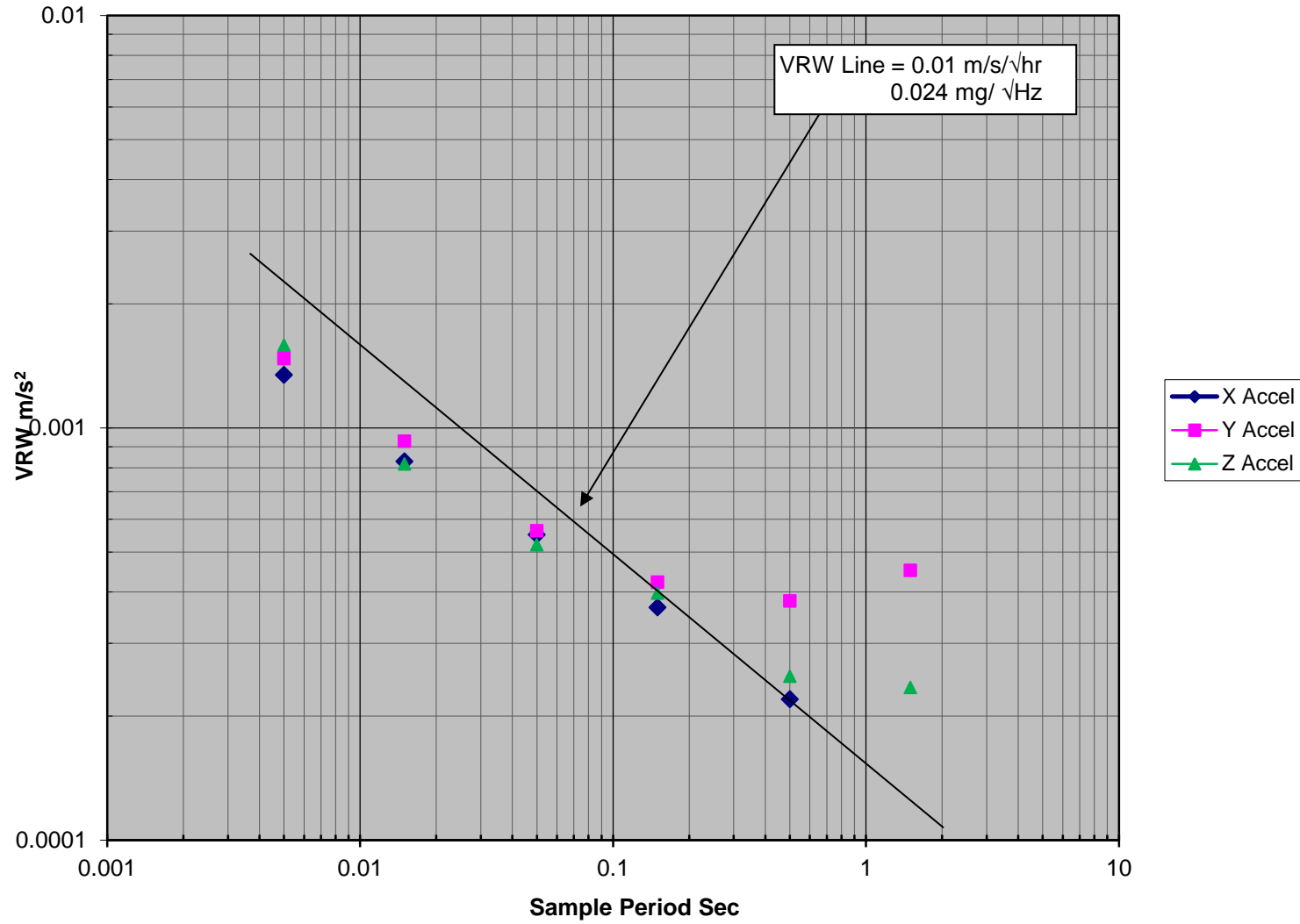
Gyro %s /g	Input g =			Accel In g's
x	0.000	0.001	0.000	x
y	0.000	0.000	0.000	y
z	0.002	-0.001	0.000	z

Accel		Accel In
Mis-Align	mrads	
-0.11	-0.04	x
0.04	-0.64	y
-0.17	0.64	z

Accepted by:

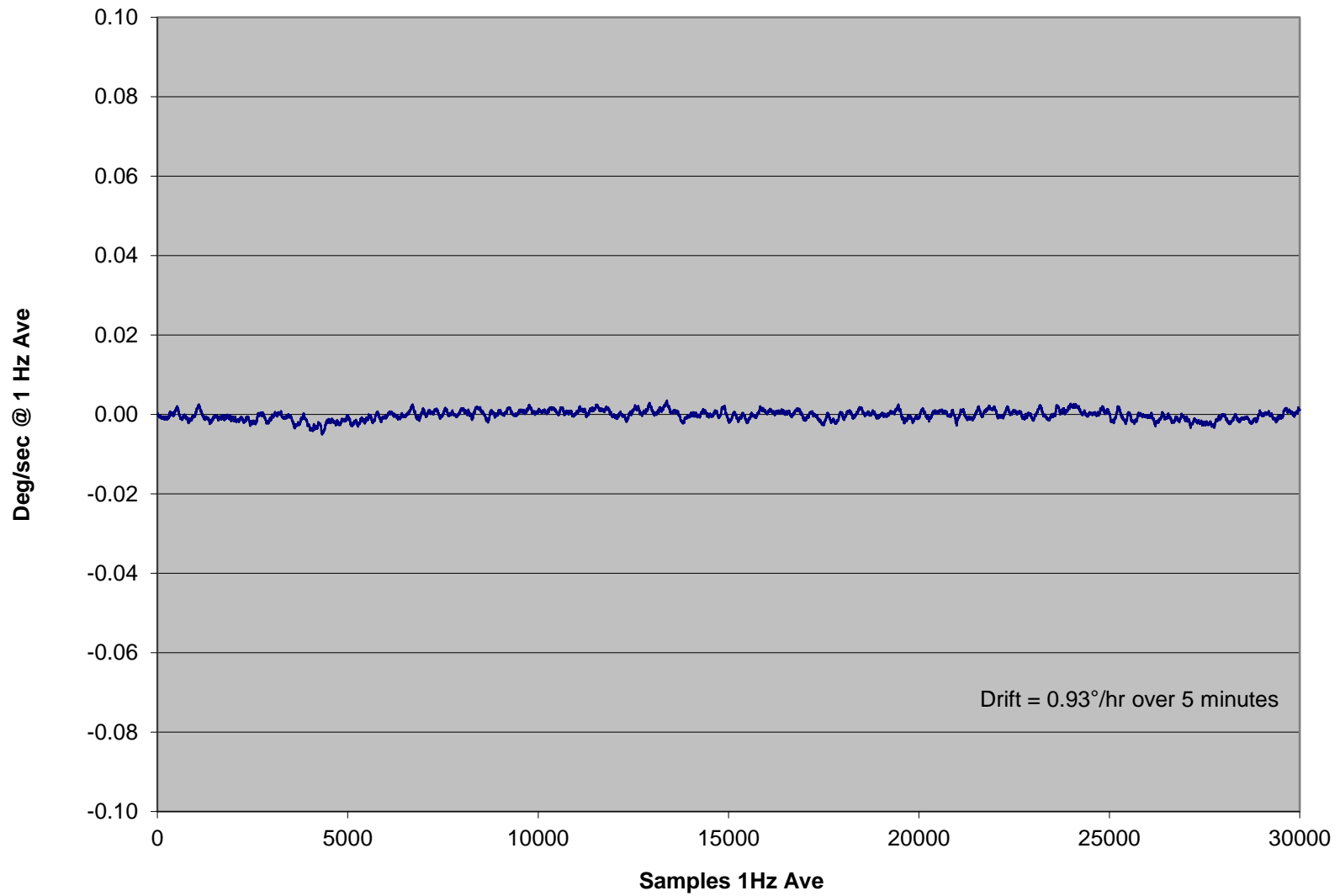




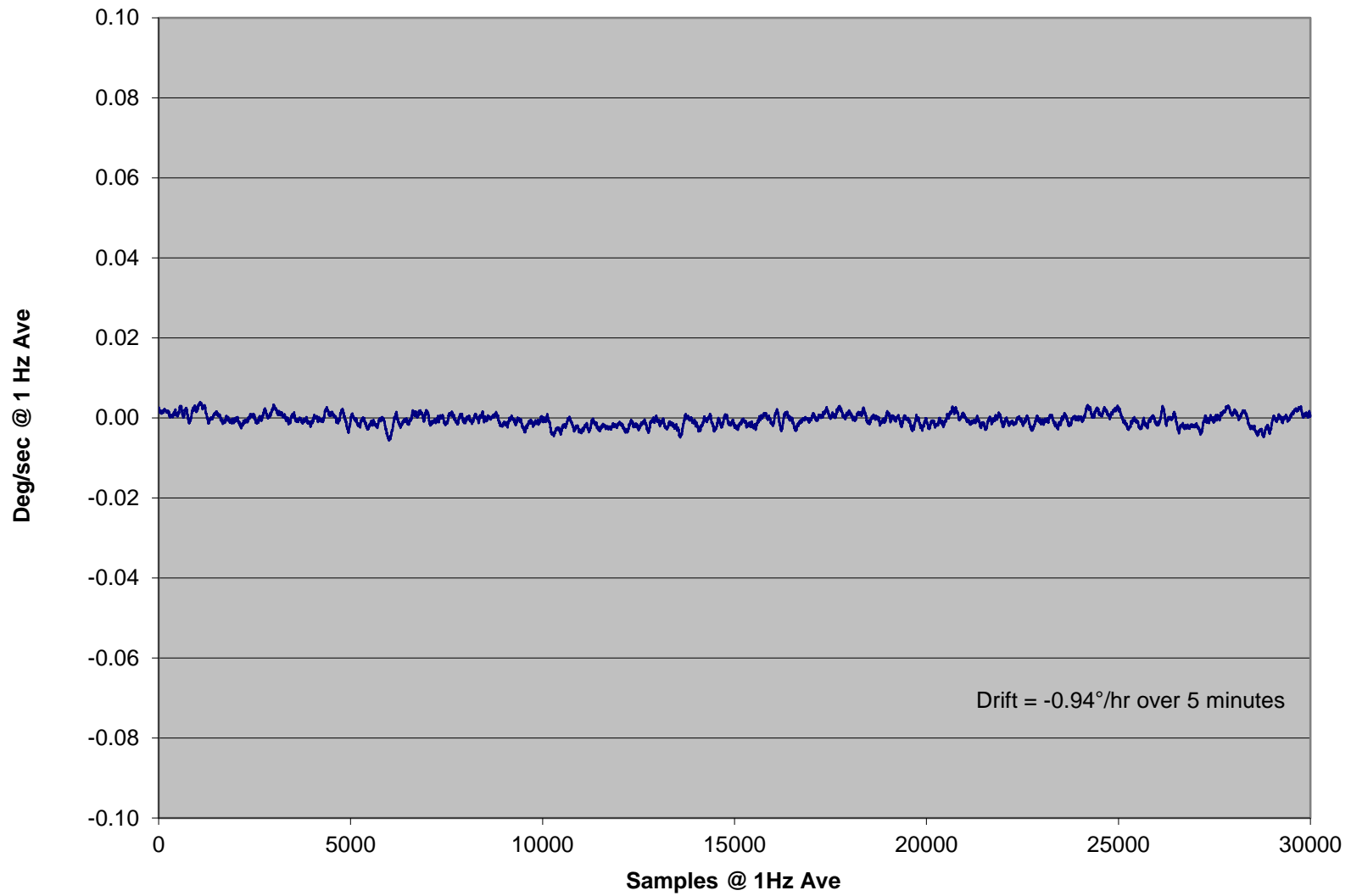




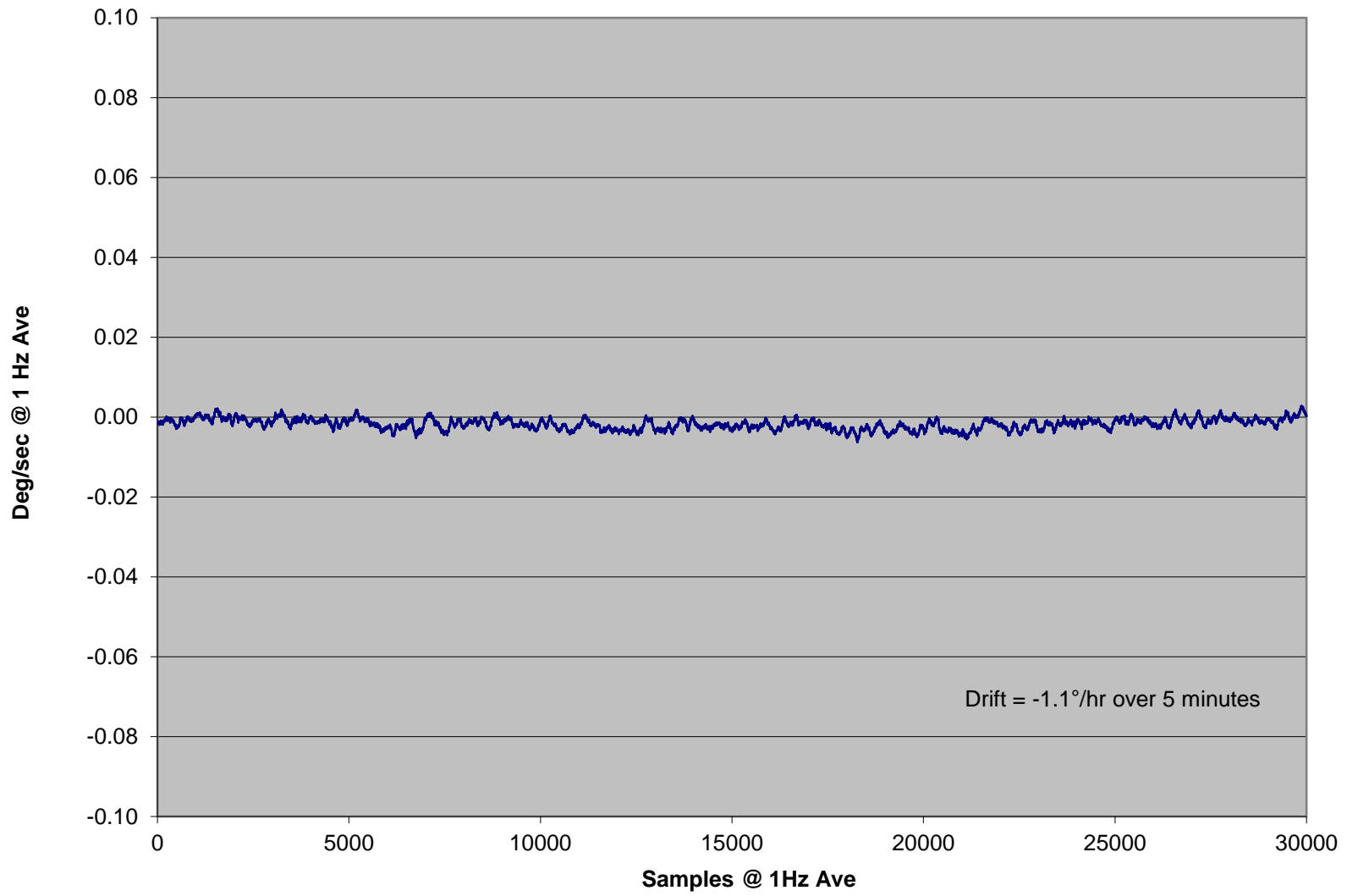
### X Gyro In-Run Bias



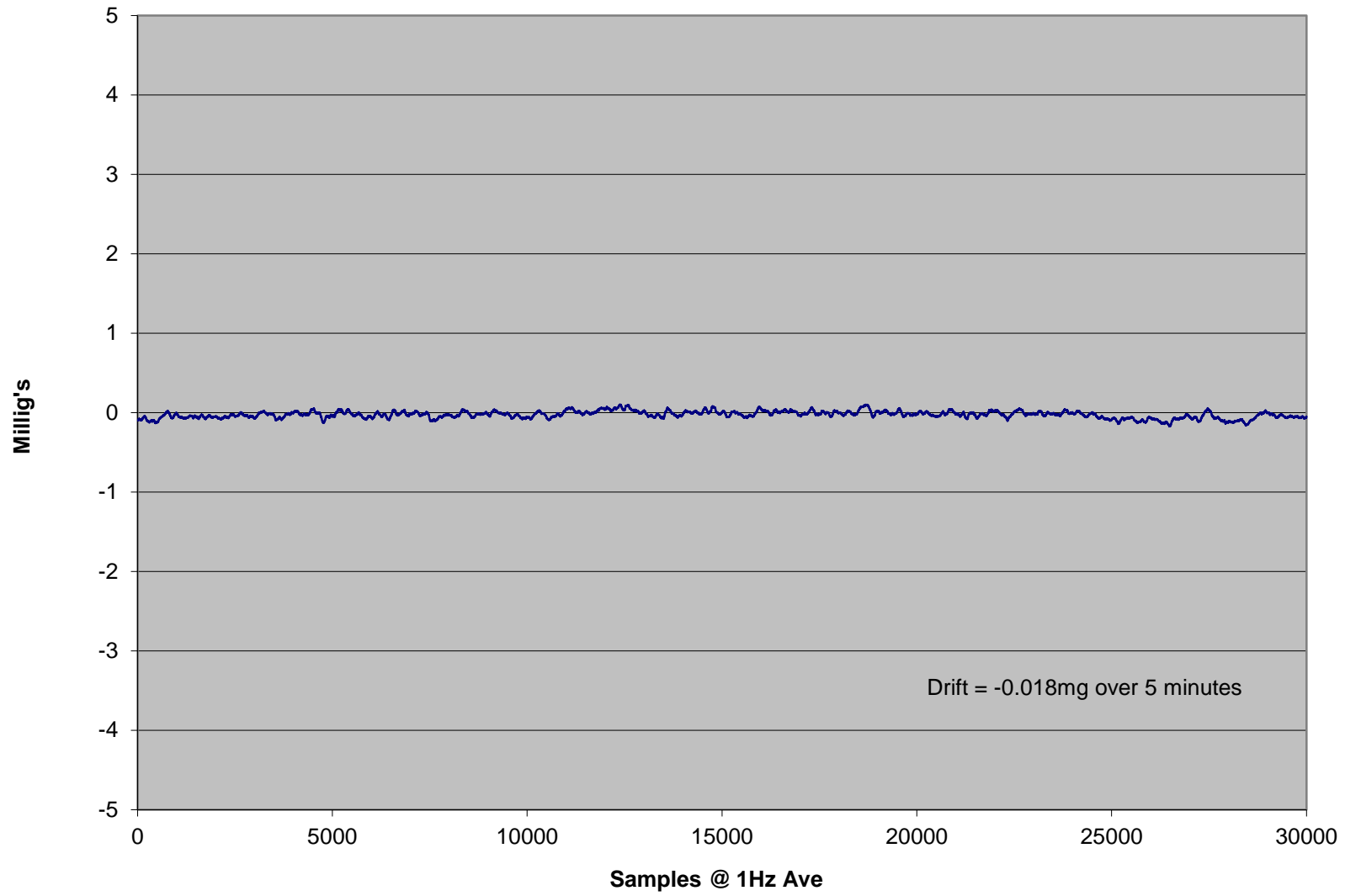
### Y Gyro In-Run Bias



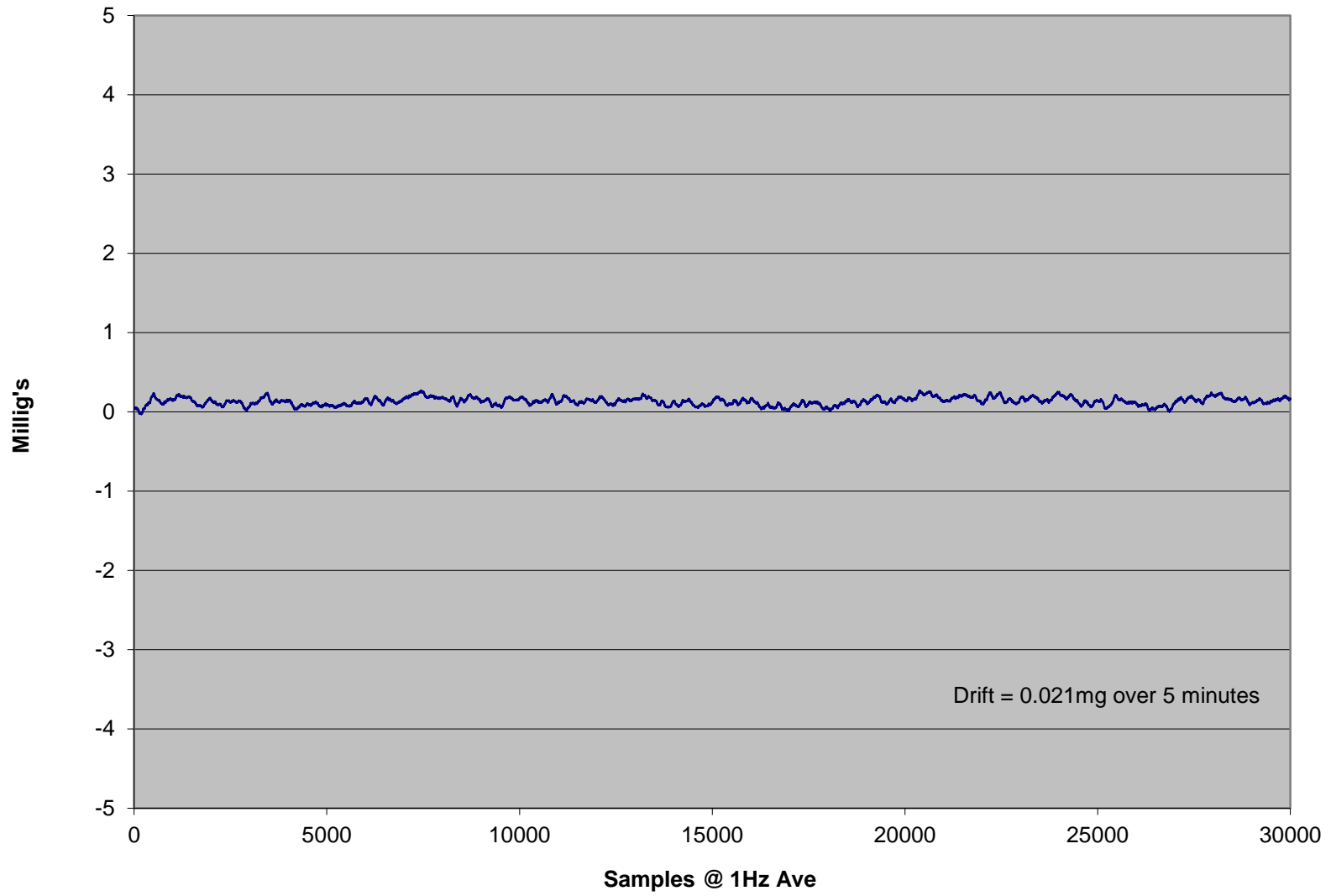
### Z Gyro In-Run Bias



### X Accel In-Run



### Y Accel In-Run



### Z Accel In-Run

