

LORD TECHNICAL NOTE

Sustained Acceleration Testing on the G-Link2™



LORD MicroStrain's G-Link2™-LXRS® sensors, depending on configuration, are single-axis or tri-axis accelerometer wireless nodes capable of measurements up to 200 g in each axis. While the internal accelerometer components are capable of withstanding and measuring accelerations at that magnitude, of primary concern is the survivability of the system electronics, primary battery, and internal wiring during a high-g loading scenario.

Nodes were tested conservatively in increasing steps of sustained acceleration magnitude by mounting two 180°-opposed G-Link2 units to a 6.75 diameter shaft (opposed for shaft balance at high speeds). The shaft was supported on both ends by bearings, and it was driven by a 10 HP 220V motor. Test points were recorded at 925 RPM, 1375 RPM, and 2000 RPM.

Table 1 below shows the equivalent acceleration and sustained force values. The acceleration values are derived from the equation $A = \omega^2 r$. It should be noted that acceleration and force numbers are slightly conservative since r is only measured to the outer radius of the spinning shaft, not to the center of gravity of the node.

Test Point	RPM	Acceleration (g)	Force (N)
1	925	82	143
2	1375	181	316
3	2000	383	669

Table 1: G-Link2™-LXRS® Sustained Acceleration Test Results

Each test point was conducted two times, while observing node wireless output in Node Commander®. In each case, the nodes continued to function before, during, and after the imparted accelerations. Following the imparted accelerations, node output returned to its original calibrated offset value without any perceived shift. A visual inspection revealed no damage to the electronics, the primary cell, or the enclosure. The battery did not lose a connection with its contacts or cause any power interruptions throughout the testing.

The G-Link2 is currently rated to 200 g of acceleration on the website, and should continue to be so on the specification. Our acceleration measurement ability is limited by the availability of accelerometers from our suppliers. However, the G-Link2 is capable of surviving sustained accelerations of more than 300 g.

LORD MicroStrain® support engineers are always available to expand on this subject and support you in any way we can. Please contact Dan O'Neil at daniel.oneil@lord.com.

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