

Full Flight Technology enables ultraprecise archery and ballistics measurement with arrow-mounted ADI *i*MEMS accelerometers

FULL FLIGHT
TECHNOLOGY



The ADXL346 is housed in a 9 mm diameter aluminum arrow tip.

For many, the image of an archer drawing a bow is the very embodiment of precision. Bow hunters, warriors, and sportsmen through the ages have relied upon their vision, strength, and concentration to achieve perfect accuracy, utilizing the most advanced technology available to hone their archery skills.

The engineers at Full Flight Technology (FFT) passionately embrace this tradition, advancing the state of the art with perhaps the most sophisticated microelectronics technology ever applied to the field of archery. The company's flagship VELOCITIP Ballistic System is the first ever to employ an arrow-mounted device to provide detailed information about an arrow's flight characteristics, including in-flight and impact ballistics data. Within each VELOCITIP arrow tip, an ADI 3-axis ADXL346 digital *i*MEMS accelerometer measures ballistics data with unprecedented precision, from launch to target impact.

To achieve the aggressive design goals required for an arrow-mounted embedded electronics assembly, FFT's engineers sought an accelerometer that delivers the perfect mix of measurement precision, low power consumption, and ruggedization in a form factor and weight profile comparable to a conventional arrow tip. Providing high resolution (13-bit) measurement at up to $\pm 16 g$, the ADXL346 is ideally suited for high precision ballistics measurement across peak acceleration values, with a high sample rate to maximize system accuracy. The ADXL346's integrated memory management system with a 32-level first in, first out (FIFO) buffer is used to store ballistics data and further maximize measurement accuracy by allowing the host processor more available time to write to memory during data collection.

Contained in a small 3 mm \times 3 mm \times 0.95 mm package, the ADXL346 fits easily inside the 9 mm diameter aluminum arrow tip housing alongside the other system electronics and the coin cell batteries that power the arrow tip device. The ADXL346's ultralow power consumption ensures that the system's batteries last up to a minimum of 100 arrow shots, and its durable plastic casing ensures system survivability—at 5000 g impact—for a minimum threshold of 100 shots.



The VELOCITIP arrow tip is removed from the arrow and plugged into this docking station for data download.

“High precision archery requires high precision equipment and technology. ADI's ADXL346 accelerometer is an essential enabling technology for our VELOCITIP Ballistic System.”

Bob Donahoe, Founder, Full Flight Technology