

# 12 DOF SENSORS WITH ACCELERATION COMPENSATION

## PRODUCT OVERVIEW

The ability to compensate for the effects of acceleration when using force and torque sensing devices has long been desired. **JR3** has made it a reality. Acceleration compensation is now available for most **JR3** force and torque sensor families utilizing integrated electronics.

When a mass is moved through space, acceleration and deceleration due to starting, stopping and change of direction produce force and torque loads. It is often desirable to measure contact loads while a tool or part is in motion. Until now it has been impossible to distinguish contact loads from the forces and torques due to acceleration.

By measuring accelerations, forces and torques simultaneously, those loads due to contact can be distinguished. This allows contact forces and torques to be controlled even in the presence of loads due to motion.

The signal conditioning electronics for forces, torques and the six axes of acceleration are integrated into the sensor body. The electronics includes amplifiers, analog to digital converters, EEPROMs containing calibration data and RS-485 serial drivers. The sensor outputs a 2 megabit per second serial data stream for forces and torques and an additional 2 megabit per second serial data stream for accelerations. Both streams contain complete 6 axis data at 8 kHz and can be read by any of **JR3's** serial receivers.

Acceleration compensated force and torque sensors are available with the same load ratings and bolt patterns as their parent 6 DOF sensor families. Linear accelerations on the X, Y, and Z axes can be measured up to 5 g. Angular accelerations about these axes can be measured up to 200 radians /second/second. Other acceleration ranges are available.



**JR3 Model NO. 107M42A-I50**

### Capacities and Resolutions:

#### 5 g Model:

ax, ay, az	
5	g
0.01	g

$\alpha_x, \alpha_y, \alpha_z$	
100	rad/sec/sec
0.1	rad/sec/sec

The top of the transducer contains a copy of the robot's tool flange. This feature eliminates the need for adapter plates, which saves weight and lowers the installed height.

**JR3** acceleration compensated force and torque sensors interface to a variety of receiver electronics. **JR3** has DSP-based receiver electronics available for several industry standard computer busses. These receivers are able to process the force and torque or acceleration data at the full 8 kHz data rate. They provide decoupling, coordinate transformation, low-pass filtering, vector calculation, threshold monitoring, peak capture and rate calculations.

**JR3, Inc. has been designing and manufacturing six axis loadcells since 1983. We have manufactured six axis loadcells ranging in diameter from 2 to 13 inches, and with load capacities from 1 to 25,000 lbs and 0.25 to 22,000 ft-lbs. Please feel free to call our applications engineers to discuss your particular needs.**