

Quick, Precise Weight Calculation

More Efficient Onboard Scales with
the Inertial Measurement Unit F99

At a Glance

- Compensation of multidirectional acceleration enables quick, precise, and dynamic inclination measurement
- Optimal measurement results: individual adaptation to ambient conditions by selecting the suitable compensation range
- Variety of outputs for complete application flexibility
- Reduced installation effort: measurement data in three axes for mounting in any orientation

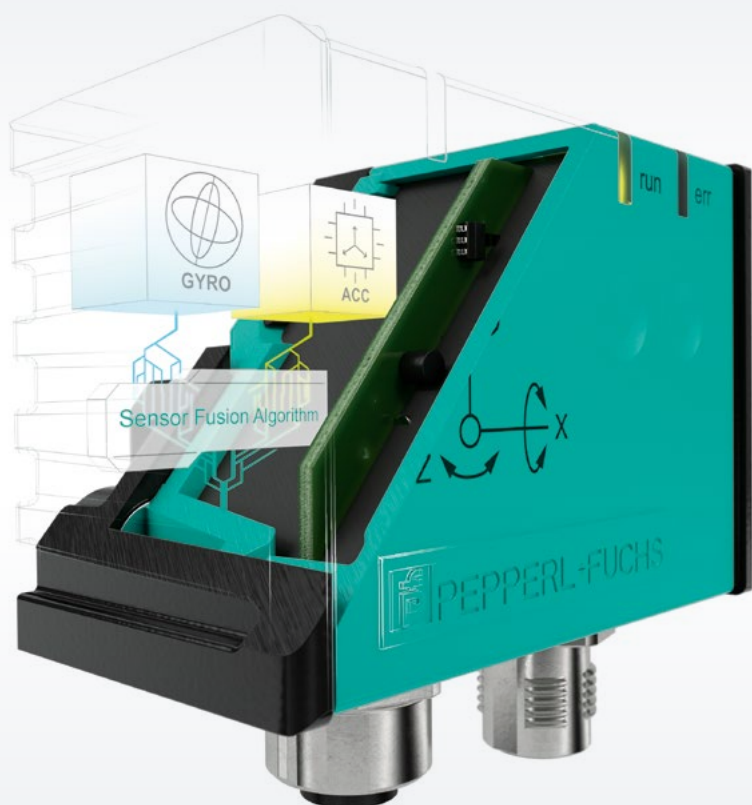


The Application

Onboard weighing systems are used to calculate the weight of materials on mobile equipment. Modern wheel loaders, for example, calculate the weight of the material directly in the bucket as it is being loaded. Unlike conventional solutions, vehicles with onboard weighing systems do not need to go to a central location to weigh materials—weighing can be done directly on the vehicle.

The Goal

When calculating weight on mobile equipment, measurement errors often occur due to external acceleration during braking, acceleration, or when driving around curves. To prevent incorrect measurements, the vehicle would normally have to make a complete stop to calculate weight accurately. Due to time and cost, this is not an option. The goal is to compensate for such disruptions and enable weight calculation while the vehicle is moving.



The Solution

An intelligent combination of an acceleration sensor and a gyroscope allows the IMU F99 to compensate for external acceleration. This makes high-precision inclination measurement in motion a reality. With acceleration-compensated inclination data, weight can be calculated while the vehicle is moving, without delay. In addition, the type of acceleration compensation can be configured and optimally adapted to the individual motion pattern of the application by selecting a compensation range.

The Benefits

The intelligent Sensor Fusion Algorithm of the sensor ensures accurate weight calculation directly on mobile equipment. Specially developed for outdoor use (IP68/69K) and use on public roads (E1 approval), the inertial measurement unit F99 is suitable for a wide range of applications and increases the efficiency of the overall process.

Technical Features

- Inclination, acceleration, and rotation rate measurement along three axes
- Adjustable compensation range
- Degree of protection: IP68/IP69K
- Temperature range of -40 °C to $+85\text{ °C}$
- Housing withstands mechanical impact up to 100 g
- Interface for parameterization
- Output formats and values can be selected
- Suitable for dynamic applications
- E1 approval

