

**MATERIAL HANDLING / OVERHEAD CRANES**

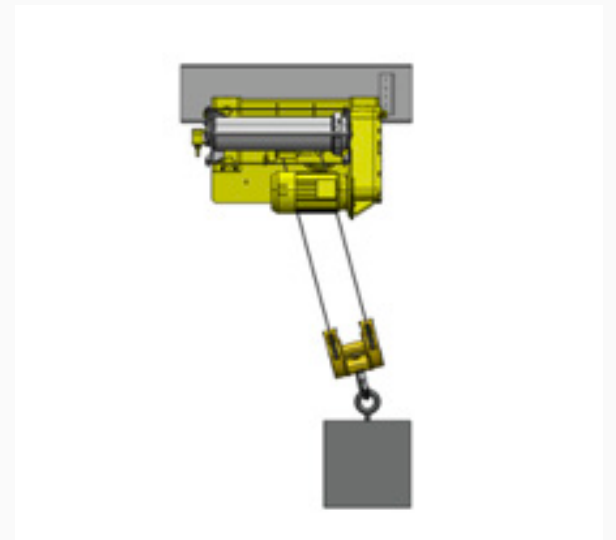
# Hoist Side Pull Detection with Tilt Sensors

## APPLICATION

A two axis MEMS based tilt sensor is mounted on a bracket clamped to the dead end of the wire rope on the hoist near the frame to detect side pulling.

## SUMMARY

Usage of hoists for lifting loads in industrial applications has inherent risk, requiring the need for safety precautions. If a load is not lifted directly vertical and is permitted to side load a hoist, damage to the hoist, injury to personnel, and/or damage to nearby equipment can result. This is referred to as “side pulling” a hoist. Detection of potential side pull conditions can be tied into hoist controls to not permit a lift under this condition.



## USE CASE

### Safety Regulations & Damage Control

When a large load, such as a stamping die, injection mold, or a container is not lifted with the hoist centered, the risk of injury or damage increases. Side pulling a hoist is not permitted by OSHA regulations under most conditions.

**Many hoists installed in industry do not have any form of side pull protection installed.**

#### Side pulling a hoist can result in:

- ⊕ Damage to hoist if it is not engineered to handle the side pull load; The result can be physical damage to the hoist or can be as dangerous as snapping a wire rope on the hoist
- ⊕ Personnel injury if the load shifts once it is lifted from its resting place on the floor or a staging fixture
- ⊕ Damage to nearby equipment once the load shifts after it is lifted

## SOLUTION

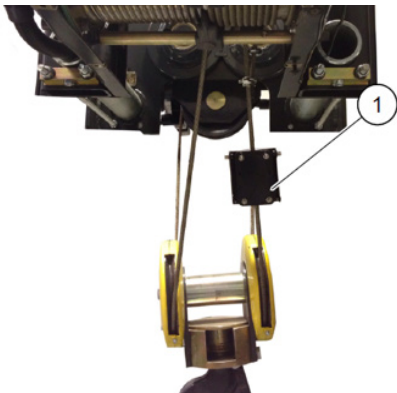
# LaserView Technologies can provide a solution by applying DIS MEMS based tilt sensors to a hoist.

DIS tilt sensors are unique in the industrial market because they provide user-adjustable functionality:

- ↻ User settable limits in each axis
- ↻ Hysteresis
- ↻ Time delay
- ↻ Filtering to deal with vibrations common to a hoist
- ↻ Zero or centering function
- ↻ SIL1 safety rated versions available
- ↻ MEMS based device means no moving parts
- ↻ Each sensor is fully potted, rated IP67, IP68, or IP69K sealed, shock rated and typically operates in ranges from -40C to +85C temperatures



*Properly equipping a hoist with a DIS tilt sensor adds another layer of accident prevention. The sensor's parameters can be configured by the end user during installation to suit the operating conditions.*



## We recommend our 2 axis tilt switch or our 2 axis omni directional tilt switch.

In some cases, the tilt sensor can be applied to an under hook lifting device, such as a spreader bar.

As a more generic solution, DIS tilt sensors can be mounted on an angle plate clamped to the dead end of the wire rope near the hoist frame.

The 2 axis tilt switch provides 2 distinct axis, dependent on gravity. The omnidirectional tilt switch detects an inclination in any combine vector of x or y axis, making it better suited as a general solution to detect side pulling in any combination of directions (X/Y planes).