

Inclinometer

The digital inclinometer is an electronic device capable of measuring the inclination in one or more axes of the Cartesian plane. It has a sensor, like smartphones and tablets, which is based on an accelerometer, an electronic component that contains microcrystals that, when subjected to the pressures of acceleration and inertia of deceleration of movements mechanical, generate electrical signals as a function of their piezoelectric properties. Based on these signals, they can be used to determine direction, intensity, acceleration, and angle of these actions and, thus, constitute an infinity of applications.

In the case of the Axxtech inclinometer, our tilt sensor is developed with a microencapsulated accelerometer that allows us to know the angles at which it is in relation to the axes of an XY plane. Thus, Axxtech's inclinometers are designed to evaluate the X (lateral) and Y (longitudinal) angles in which a particular vehicle is in relation to the ground, being able to take signaling and even blocking actions to prevent it from tipping over.

Speaking more specifically about Axxtech inclinometers, applied to dump trucks, we know that their buckets can be up to 12.5m long, implying at a height of up to 12.4m when tilted at 45°. This is too high for a support base that is at most 2.5m wide, considering the distance between the outer sides of the wheels. Considering in this case that the support base is much smaller than the height obtained, if this base is on a certain terrain that presents a maximum lateral inclination (X) greater than 4°, it will already leave its gravity pendulum out of the vehicle axles, which significantly increases the chances of tipping. In this case, in addition to the facts that the loads can move in the unloading in a non-uniform way, and that there may be small settlements of the ground due to the concentration of weight on the wheels close to the tipping axis, we recommend and factory set the maximum limit of 2.5° for the X axis, adopting a safety margin that allows tipping safer for its operators. In short, the inclinometer will block the vehicle's bucket lifting system when it realizes that the terrain chosen for tipping has an inclination greater than its maximum configured limit, so as not to allow the operator to tip over. In this situation, the operator will need to reposition the vehicle until the inclinometer shows a smaller angle.

In addition to blocking actions for dangerous situations, the Axxtech inclinometer visually and audibly signals every moment of operation, providing the operator with full knowledge of the state of his bucket. All operations are recorded and stored so that, in cases of control or loss, can be recovered and analyzed.

In atypical situations, such as a vehicle undergoing maintenance, being tested, or unloading in an uneven yard, a tipping can be made where the inclination is not adequate. In this situation, the Axxtech inclinometer, through its "Forced Tilting" menu, may, at the operator's expense and risk, allow tilting at an angle greater than the maximum configured. However, in this case, the operator will need a password and identification; as well as date, time and X and Y angles of that moment will be recorded and made available to be analyzed if there is a circumstance of an accident.