

► Pilz – for a safe crane system

Crane systems

The safety of personnel and machines is a decisive factor in all crane applications. Your investment in the safety of your crane system not only offers commercial advantages, but ensures the protection of your employees and customers.

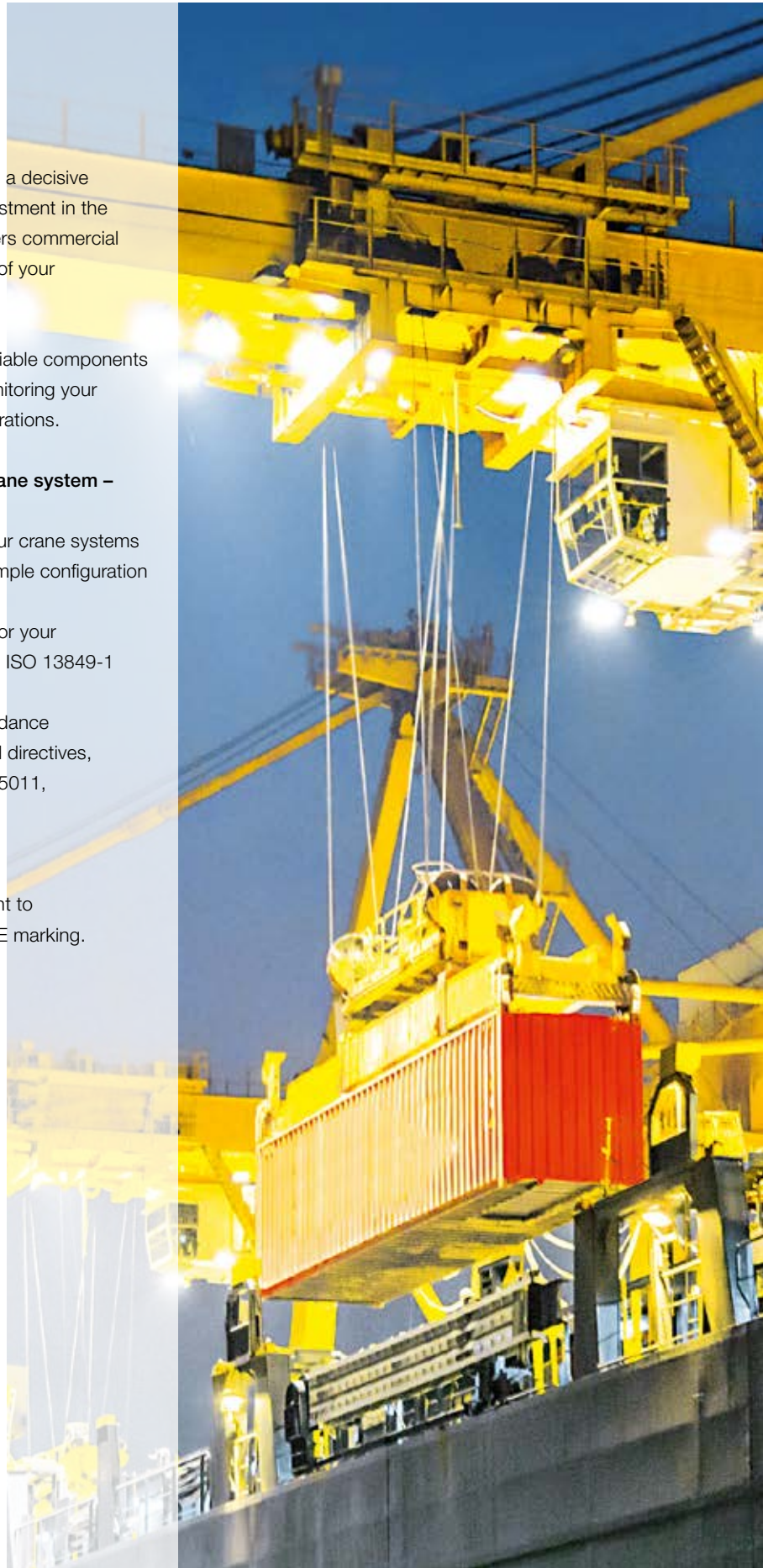
As your safety partner, Pilz offers you reliable components and simple automation solutions for monitoring your safety functions in the area of crane operations.

Safe automation solutions for your crane system – the advantages Pilz offers you:

- Greater efficiency and economy for your crane systems
- Savings in time and money through simple configuration and programming software
- Flexible, modern automation solution for your crane system, certified to PL e DIN EN ISO 13849-1 and SIL CL 3 DIN EN 62061
- Standard-compliant solutions in accordance with internationally valid standards and directives, such as the DIN EN 13 001, DIN EN 15011, and MD 2006/42/EC crane standards

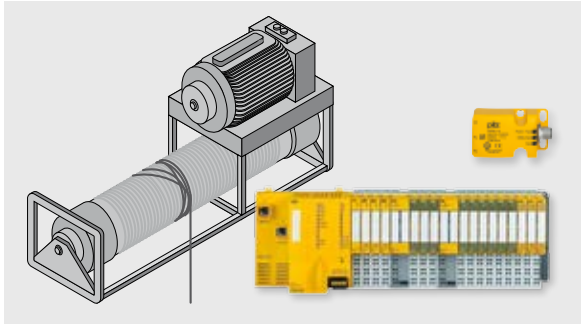
Benefit from personalised services:

We will support you from risk assessment to the verification of safety solutions and CE marking.



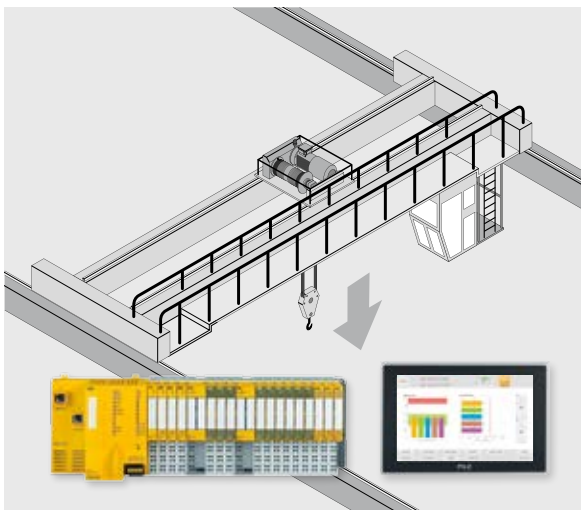
► Safety functions for crane systems

Pilz, an experienced expert, allows you to monitor a wide range of safety functions for bridge and gantry cranes and for cranes with dynamic or static crane booms. The automation system PSS 4000 in conjunction with the extensive selection of Pilz sensor technology provides you with a universal automation solution for your projects.



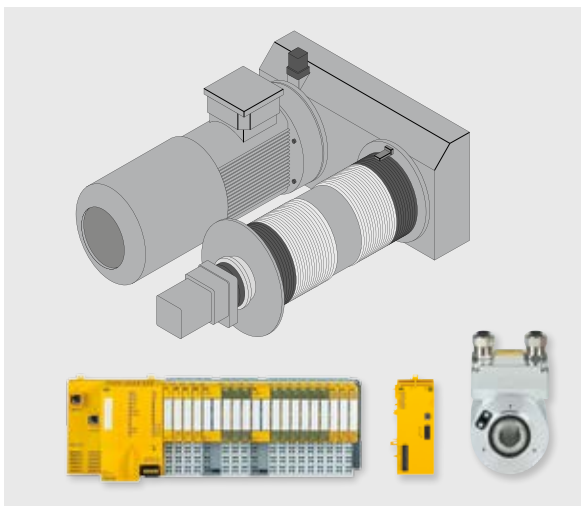
Cable monitoring

Monitors the proper coiling of the cable. The PSS 4000 and the safe proximity switch PSEnini ensure that the cable is not damaged due to position overrun. The safe initiator monitors the position of the cable control mechanics. It detects a cable overrun to a different cable position.



Overload protection

The monitoring of individual and cumulative loads and centre of mass. Individual and cumulative overload protection is ensured by means of the PSS 4000 with safe analogue inputs and one/several safe load measurement cell(s). In addition, underload measurements (slack cable detection) and partial load switching can be arranged. Pilz's visualisation software PASvisu and the display device PMI allow the threshold value to be adjusted after the password is entered.



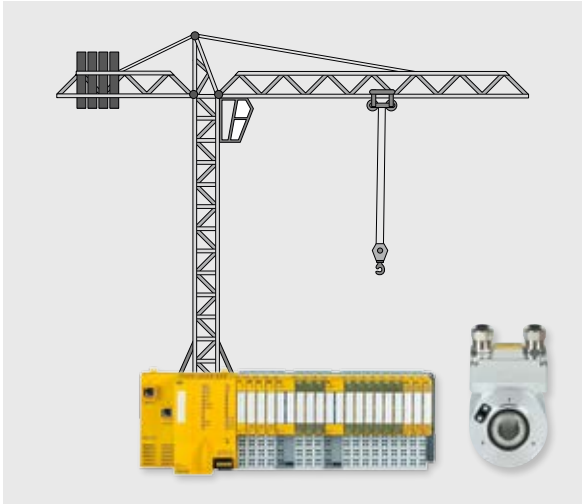
Speed monitoring

Monitoring the speed of crane movements. The current and target states of the crane are compared by means of the PSS 4000 with the motion monitoring module PSSu K F EI and/or the rotary encoder PSEnenco. If the established upper limits, including tolerances, are exceeded, a safety-related shutdown will be initiated.

Gear breakage monitoring

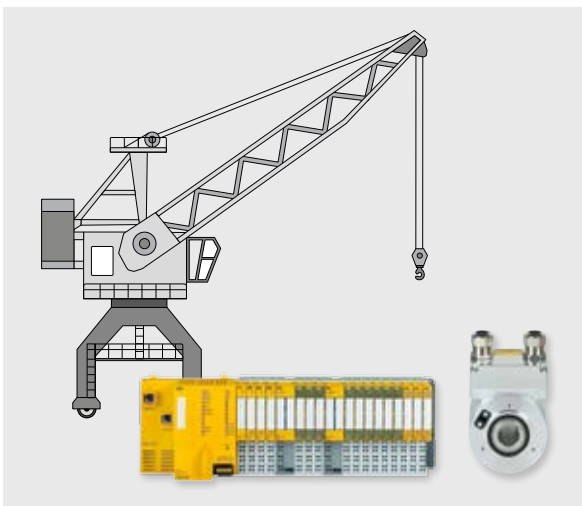
The safe monitoring of the relationship between motor speed and cable drum speed. Deviation from the tolerance window and thus gear breakage is detected by means of the PSS 4000 with the motion monitoring module PSSu K F EI.

Online information
at www.pilz.com/cranes



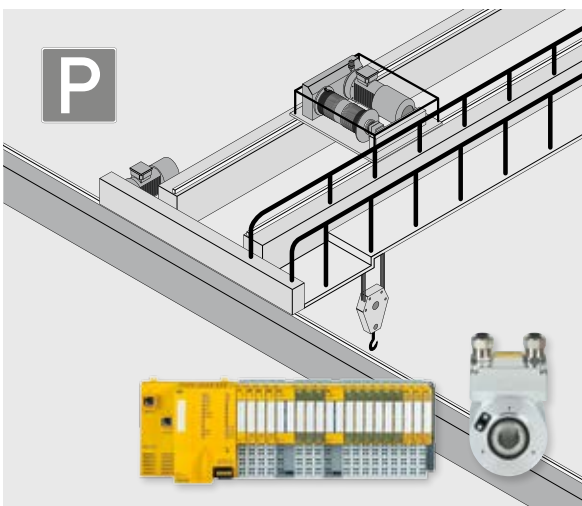
Length measurement

Measurement of the distance travelled by the crane, trolley, or hoist is performed by the PSS 4000 in conjunction with PSENenco. This makes exclusion zones easy to set up because limit switches for obstacles and end stops are no longer necessary. Material warehouses can also be automated by means of this system, since loads can be precisely positioned.



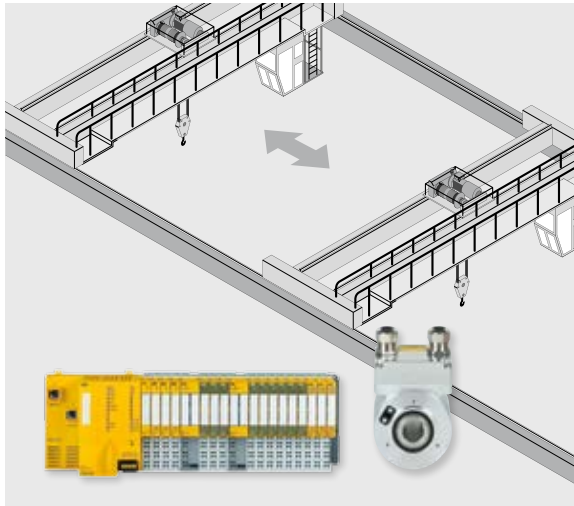
Angle measurement

The measurement of inclination of crane booms by means of the PSS 4000 with the PSENenco. The maximum permissible angle limits are safely adapted depending on the current load. The automation system PSS 4000 can be used depending on the current angle of the crane boom and relevant analogue sensors to provide information by means of secure calculation algorithms that ensure constant, safe load monitoring. The movement ranges of slewing gears can also be efficiently secured.



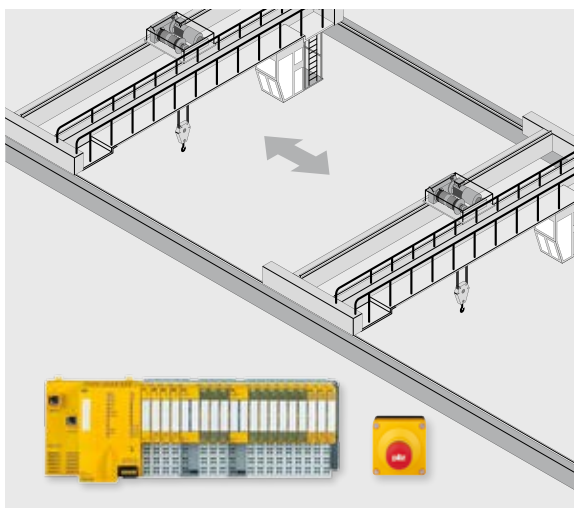
Position monitoring

The reliable standstill monitoring of the crane in a given position, such as the maintenance or park position. The PSS 4000 and PSENenco are used to monitor whether the crane leaves a determined movement tolerance window. This concept allows a safe operating stop (SOS) that complies with EN 61800-5-2.



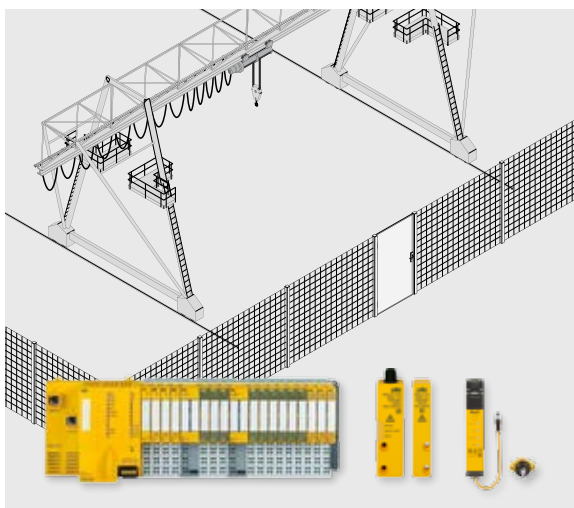
Collision monitoring

The safe monitoring of distances from moving obstacles using suitable sensor technology and the PSS 4000. The high bandwidth of the available PSS 4000 electronic modules allows a wide range of measuring sensors – from analogue to digital, incremental to serial – to be used. The data exchange between the two cranes is performed by means of two PSS 4000s and PSEnencos through a safe, Industrie-4.0-compatible real-time Ethernet SafetyNET p without any other network components – and can even be performed with existing Industrial Ethernet. This means that each of the two systems knows the coordinates of the other in real-time and can optimally adjust its software limit switches.



Emergency stop

An emergency stop that conforms with the Machinery Directive. In accordance with the Machinery Directive, crane systems must be fitted with emergency stop equipment so that damage can be averted or reduced in the case of an emergency. In a dangerous situation, emergency stop control devices are operated manually, triggering a signal to halt a potentially hazardous movement. The operator uses the emergency stop button PITestop in case of danger, transitioning the crane to a safe stop by means of the PSS 4000. After the PITestop has been unlocked, the reset and/or start function in the PSS 4000 can be used to resume operation.



Access monitoring

Securing of access points. Securing access points is especially important for automated crane systems. This means that they must be monitored and, if necessary, locked. The PSS 4000 evaluates door monitoring systems (PSEncode, PSEnmag), safety gate systems (PSEnsgate, PSEnlock, PSEnmlock, PSEnbolt), or light grids (PSEnopt) so that the crane system will be safely stopped when personnel enter.

Online information
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► Services for crane systems

Pilz has many years of experience in the field of machinery safety services – trust our experts. We will support you with our expertise in your particular tasks:



Risk assessment

Together with you, we will conduct a technical inspection of your crane system in compliance with the harmonised standards and EU directives currently in effect. The goal of the risk assessment is to determine all existing hazards in all of the machine's lifecycle phases, estimating their likelihood of occurring, and evaluating the extent to which protective measures and safeguards are to be used.



Safety concept

Pilz's safety concept specifies concrete protective measures and safeguards. This document provides a roadmap to a safe crane system. In preparing it, we pay special attention to the interaction between workers and machines and to productivity and scope of maintenance work.



Safety design

The goal of the safety design is to reduce or eliminate danger zones in your crane system by means of a detailed report. In addition, the safety functions are documented with the required Performance Level or Safety Integrity Level.



System integration

The results of the risk assessment and safety design are implemented to suit your crane system's particular requirements through selected safety measures.



Validation

Validation of the selected safety functions is essential for verifying that your crane system is safe. The internationally harmonised standards DIN EN 13001 or DIN EN 15011 and the Machinery Directive (2006/42/EC) require the validation of safety functions.



Inspection of safeguards

We inspect all your crane system's technical safeguards with regard to installation, condition, and safe function. This includes emergency stops, safety gates, and optoelectronic safeguards such as light curtains, laser scanners, and camera-based systems.

Support

Technical support is available from Pilz round the clock.

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Pilz develops environmentally-friendly products using ecological materials and energy-saving technologies. Offices and production facilities are ecologically designed, environmentally-aware and energy-saving. So Pilz offers sustainability, plus the security of using energy-efficient products and environmentally-friendly solutions.



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