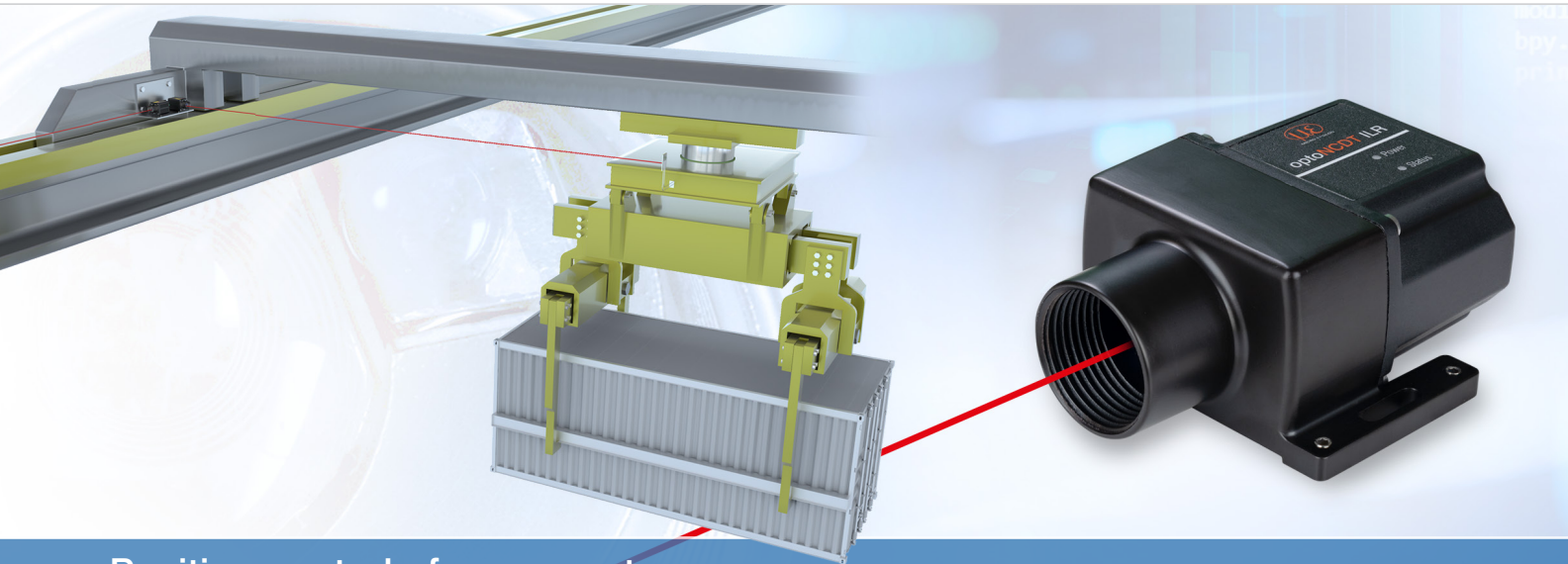




Position control of crane systems

Single girder overhead traveling cranes, double girder bridge cranes and overhead traveling cranes are used in almost every logistics and production plants. They combine efficiency and economy. The crane systems are used to support work in the automatic warehouse and the production areas.

Crane systems must be controlled reliably and extremely precisely. This is the only way to achieve a fast, safe and efficient material flow, even for individual requirements. The control of the crane system is therefore based on the measured values of highly accurate laser distance sensors from Micro-Epsilon, which are designed for large distances as well as fast distance changes.

Two laser distance sensors of the optoNCDT ILR3800-100 series are used. These are positioned at one end of the main girder of an overhead crane and measure to millimeter accuracy on a white target board. The first sensor detects distance changes of the main girder in x-direction, in the range of 0.1 to 100 m. This is performed continuously and during crane travel. The second sensor continuously measures the movements of the trolley between 0.1 and 25 m in the y-direction. If the value falls below a certain pre-defined setpoint, for example because the trolley is moved too close to the end position, it stops automatically. The same applies if the main girder comes too close to the wall. In this automated process, the measured values of the sensor are transferred to the control unit of the crane via the integrated serial RS422 interface.

The high-performance optoNCDT ILR3800 laser distance sensors are used wherever large measuring ranges and high accuracy are required. They can be installed at a distance of up to 100 m and with additional reflector film at a distance of up to 150 m. The sensors provide stable results with millimeter accuracy, even on dark, structured or poorly reflecting surfaces.

Requirements for the measurement system

- Measuring range: 0.1 ... 150 m
- Measuring rate: 20 Hz
- Resolution: 0.1 mm
- Repeatability: < 1 mm
- Linearity: < ±1 mm

Ambient conditions

- Temperature range: -10 ... +50 °C
- Production plant
- Scattered light from ceiling illumination
- Dust, dirt
- Vibration, humidity

System design

- 2x optoNCDT ILR3800-100 sensors
- 2x reflectors

Advantages

- Millimeter-precise determination of the crane position due to precise measurement of large distances
- Auto mode for maximum reliable signal strength on demanding targets
- Fully automated monitoring
- Reliable and maintenance-free measurement
- Robust sensor solution for indoor and outdoor use

