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## Measurement and display system for risk assessment

# Tilt and inclination sensor technology with LED visualisation increases safety during extreme heavy transports

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Huge components, mostly made of steel or concrete, sometimes need a little more space on the road. The situation becomes extreme when excess width, length and weight are combined with a high centre of gravity of the load. Althen GmbH developed new sensor and measurement technology especially for the transport of an oversized heat exchanger so that the load could be transported safely and securely to its destination. Real-time visualisation was provided by the large graphic-capable LED displays supplied by MicroSYST Systemelectronic GmbH, which displayed the current measurement data reliably, clearly, unambiguously and in real time in all weather conditions.

### Angle of inclination constantly in view

In addition to the usual necessities such as special trucks, exact planning of the routing or consideration of narrow passages and bridge heights, heavy transports of this size present further challenges: enormous weight and sprawling dimensions (especially in height) result in unfavourable centres of gravity for the entire transport. In the case of the 324-ton heat exchanger, the centre of gravity was 3.80 metres above the vehicle's trailer. Permanent condition monitoring is indispensable in such cases: Mobile measuring systems monitor the angle of inclination of the load and thus help to minimise the risk of tipping or to take countermeasures at any time. For less critical transports, transport companies often use a simpler pendulum for monitoring the tilt angle, which is attached to the load together with a scale. If the pendulum deflects too much, the tilt of the hydraulic system is corrected by an operator during the transport.

### Electronic measuring system for precise monitoring

For transports with a very high weight and centre of gravity, even a few degrees of inclination can cause the tipping point to be exceeded. This was also the case with the 324-ton heat exchanger mentioned above: only a very small tilt amplitude around the zero point was acceptable, which is why standard applications failed and electronic monitoring was required as an alternative. Althen specifically developed a suitable measuring solution that precisely

took into account the requirements of the system in terms of measuring range, measuring accuracy and type of visualisation. The result was the Althen MTMS, a mobile measuring system for monitoring the tilt angle, which, in addition to the appropriate tilt sensor, also contains the visualisation technology and the software including measurement signal filtering.

### **Combination of measured value and bar display for permanent safety**

The measuring unit with sensor sits in a robust diecast aluminium housing and feeds an associated, bright large LED display from Microsyst in real time. The display in the robust aluminium housing, which at 57.4 by 17.8 centimetres is compact enough for easy installation, impresses with its perfect readability from a distance of up to 20 metres. The automatic brightness adjustment enables use for day and night driving with consistently high visibility. In addition to the numerical display, a colour-coordinated bar chart on the two-line display visualises the inclination curve. "Especially when the inclination has to be observed over a longer period of time, a bar chart with warning colours is easier and more intuitive to understand at a glance when defined limit values are exceeded," explains Manuel Rass from the manufacturer Microsyst. "The traffic light system has proven itself here: Green bars means everything is in order, yellow is considered a pre-alarm and indicates to the operator that he can counter-adjust hydraulically. Red corresponds to the critical area." In addition, an acoustic signal can be heard.

**Huge loads and high centres of gravity do not immediately lose their intimidation thanks to the Althen measuring system with Microsyst LED displays, but they do make the operator's work much easier. And the heavy transports are safer overall as a result.**

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### **About Microsyst Systemelectronic GmbH**

*Founded in 1985, the company based in Weiden i. d. Opf. has been developing, manufacturing and selling LED display systems for 30 years. The comprehensive know-how in LED technology goes back to the early in-house developments. This pronounced pioneering spirit is still deeply rooted in the company today. With future-oriented thinking and environmental awareness, Microsyst will continue to dedicate itself to LED technology in the future under the following principles*

- *Know-how right from the start*
- *Individual development and production*
- *Adapted systems with unique optics*
- *Regionally sustainable and efficient*