

Liebherr introduces SmartGrip – the evolution of bulk handling

Nenzing (Austria) June 2014 – Liebherr Maritime Cranes launches the game-changing technology SmartGrip for its mobile harbour crane product range. This unique technology operates as an intelligent system which optimises grab filling rates in a self-learning manner. SmartGrip provides a number of valuable advantages, including higher performance and zero overloads.

The development of SmartGrip is based on recent turnover analyses in various ports around the world. The data showed that, on average, only 70% of the grab capacity is used. There are many factors why the grab is not operated at full capacity, including suboptimal grabbing angle and varying material density. For crane operators the estimation of the material density and the right grabbing angle may turn out to be a real challenge. As a result, ports are faced with less turnover [t/h] than expected.

Intelligent grabbing

SmartGrip is the solution to optimise grab filling rates. In a comprehensive field study, Liebherr collected real data of different crane models which were equipped with a wide range of grabs to handle different materials. Additionally, numerous crane operators ensured a broad spectrum of skill-levels during data collection. Thanks to in-depth analyses, Liebherr has deduced the ideal grab filling model by means of data mining. In operation, the self-learning system automatically adjusts its behaviour by recognizing bulk density, compression and granularity as well as current frame conditions like depth of impression or type of grab. Load cycle by load cycle, SmartGrip automatically optimizes filling to maximum capability taking grab size and outreach into account. Right from the second load cycle, SmartGrip ensures that the grab filling rate is above the average of 70%. Within a maximum of seven cycles the full capacity of the grab is utilized.

Zero overloads

Changing materials and varying density are main challenges for the crane operator in bulk operation. Furthermore, density also depends on depth of impression which means that even when working on the same hatch, handling situation may change. If the driver needs to fill the grab manually, he may overload the crane when pulling the lifting attachment out of sticky material. Frequent overloads lead to a notably shorter lifetime of the crane. Additionally, frequent overloads are also time-consuming as the crane is automatically switched off if there is too much pull on the grab. SmartGrip controls the filling of the grab to suit the load curve of the crane. This leads to perfect crane utilization without overloading. Thus, SmartGrip also works as overload prevention system resulting in an extended lifetime of the crane, saving fuel and time.

Less stress

Bulk material handling comprises a number of challenges. To maximise productivity, the grab has to be filled to the limit, which means the driver has to fine-tune grab filling by opening and closing the grab as well as hoisting and lowering. This is both stress for the operator and time-consuming.

When SmartGrip is activated, the operator can completely rely on the system for an accurate determination of the material density and optimal grabbing angle in a very short time. The automatic and optimized grab filling means less stress for the crane operator who can then focus more on other important issues like safety.

Higher turnover

Achieved turnover depends on many issues, including available infrastructure, driver skills and materials handled. SmartGrip optimises various parameters and allows for improved performance. In view of the average grab filling rate of 70%, SmartGrip offers a potential of up to 30% more turnover. Additionally, turnover variance is significantly reduced, leading to more efficiency in operation. Field studies showed that even up to 40% turnover increase are realistic if the grab filling rate is below average. Additionally,

SmartGrip partly closes the gap between high-skilled and less-skilled drivers, as some important parts of bulk handling are automatically optimised by the system.

To achieve substantial turnover increase the whole logistic chain needs to be considered. Liebherr supports its customers by offering detailed process analysis of the existing material handling infrastructure in order to harmonise transportation chains and to maximise efficiency.

Setting target loads manually

Another striking feature offered by SmartGrip is the possibility to manually set target loads. If a crane operator needs to load a 40 tonnes capacity truck, for instance, he can advise SmartGrip to fill the grab with 40 tonnes. This feature eases the operation of the crane operator.

Hardware reduction

Many bulk terminals handle different types of bulk cargo and each material comes with unique characteristics. In order to ensure efficient operation a range of grabs is necessary. However, the more grabs are needed the higher the costs. This includes acquisition costs, time needed to exchange the lifting attachment and storage space required. Due to intelligent grabbing, the number of necessary grabs is significantly reduced as the system automatically adapts the grab filling rate to the material handled and the size of the grab. Thereby the number of required grabs can be reduced without losing performance.

Suitable for retrofits

Operators of older Liebherr machines can equip their existing cranes with this unique feature for more bulk turnover. The installation of SmartGrip is fast and easy.

Path of innovation

With the introduction of SmartGrip, Liebherr successfully continues its path of innovation. This new bulk handling feature is the perfect continuation of a number of game-changing technologies introduced to the market in order to optimise bulk handling. This includes Cycloptic[®], TeachIn, Pactronic[®] and of course also the LiSIM maritime crane simulators for professional crane operator training. In close proximity to its customers, Liebherr will continue to strongly invest in research and development in order to launch innovative features designed to increase safety and productivity while emissions are reduced at the same time.

Captions

Liebherr-LPS-Port-Polnocny.jpg

Two Liebherr portal cranes (LPS 600) operating in the port of Polnocny.

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