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A large Liebherr LHM 550 crane is shown in operation on the deck of a ship. The crane is lifting a red container with a yellow hook. The ship's hull is blue and white, with "MAERSK SEALAND" and "OLIVIA MA" visible. The sky is blue with some clouds. The crane has "LIEBHERR" and "550" written on its side.

**In addition to making the crane more efficient and increasing turnover performance through increased hoisting and lowering power, the Pactronic® technology also reduces fuel consumption, CO<sub>2</sub> emissions and noise exposure.**

An LHM 550 model crane equipped with Pactronic®



# Energy Efficiency

## Liebherr Pactronic® is a green innovation

By Heather Hudson

Some companies are never satisfied with success. Liebherr is one of them.

That's why they are constantly innovating their line of mobile, construction and crawler cranes, deep foundation machines, mining equipment and other heavy construction equipment.

In addition to creating world-class products that help move the earth all over the globe, Liebherr set its sights on doing it in an efficient and eco-friendly way.

One of their recent, award-winning innovations is the Pactronic®, a unique hydraulic hybrid drive for cranes and material handling equipment. First used in mobile harbour cranes after its launch in 2010, it was awarded the State Prize Clean Technology in Austria and has become the first in their line of innovations to achieve increased handling performance with reduced fuel consumption.

Today, approximately every fifth Liebherr mobile harbour crane is delivered with Pactronic® and the hybrid drive system has been adopted by other business units in the company, including offshore cranes and construction machinery.

The recently launched subsea crane RL-K 7500 makes use of Pactronic®, as well as the duty cycle crawler crane HS 8300 HD, which was presented at Bauma 2013 this past spring.

### The concept behind Pactronic®

The name Liebherr Pactronic® is derived from Power by Accumulator and Electronics and is an innovative drive system on a hybrid basis. Instead of increasing the primary power, boosting power is accomplished by adding a secondary energy source to the system. The energy storage is connected to the primary mover via a loading pump.

A hydraulic accumulator is responsible for energy storage, which can be charged and discharged during normal operation. The accumulated energy can be used while hoisting a load.

The hydraulic accumulator is an innovation all its own. Energy is stored in this compressed gas to be released rapidly upon demand. The hydraulic energy storage technology offers significant advantages in comparison to electrical energy storage, including:

- Designed service life is equal to the crane
- Virtually maintenance-free
- Fast charging and discharging
- Performance not affected by ambient temperature (no cooling, conditioning or isolation needed)
- 100 per cent recyclable

Charging of the accumulator is done while lowering a load. The accumulator is charged by using reverse power while lowering. In addition, the surplus power of the primary energy source is also used for charging.

The stored energy is transferred back to the system when the crane requires peak power during hoisting. Consequently, the total hoisting power is the sum of the conventional hydrostatic power and the secondary energy provided by the accumulator.

In addition to making the crane more efficient and increasing turnover performance through increased hoisting and lowering power, the Pactronic® technology also reduces fuel consumption, CO<sub>2</sub> emissions and noise exposure.

Given the growing demand for alternative energy sources in the industry over the last several years, Liebherr also noted that the volume of worldwide trade flows has risen due to globalization and the liberalization of world trade.

The company saw a need for high-performing, eco-friendly machines and went to work designing and putting in place Pactronic®. It wasn't long before it was clear there was a definite increase in performance and reduction in fuel, and they expanded it into their construction machinery.





The LHM using Pactronic® in Spain

### Pactronic®: a case study

In 2011, Liebherr delivered a LHM 550 to Galigrain S.A., Marín, located on the west coast of Spain. Galigrain's first state-of-the-art mobile harbour crane is mainly used for bulk operation, including various types of cereals and bulk products from vessels up to Panamax size.

Thanks to a maximum lifting capacity of 144 tonnes and an outreach of up to 54 metres, the crane is also perfectly suitable for general cargo operation with just an exchange of the lifting attachment.

To significantly increase the efficiency in bulk handling, Galigrain equipped the new crane with the innovative Pactronic® hybrid power booster, allowing for more turnover and less fuel consumption.

"The LHM 550 has enlarged the capacity and performance of our terminals and fits perfectly into our efforts towards more efficient and environmentally friendly operations. The performance of the crane exceeded by far our expectations. We are reaching frequently a peak turnover of 1.800t/h," said Galigrain's Managing Director, Ceferino Nogueira García.

The Pactronic® is currently available as an option for Liebherr mobile harbour cranes and for the new duty cycle crawler crane HS 8300 HD, which is suitable for various applications, including dragline and grab operation or other material handling jobs. ☺

For more information on Pactronic®, visit [www.liebherr.com](http://www.liebherr.com).

## Model GK-405 Vibrating Wire Readout

The Model GK-405 Vibrating Wire Readout is designed for use with all Geokon vibrating wire sensors. It comprises a battery-powered readout unit that communicates, via Bluetooth®, with a Handheld Field PC running the GK-405 application. The Model GK-405 can also read the thermistors included with most Geokon vibrating wire sensors, and display the temperature directly in °C.

All readings can be stored and exported to a number of different file formats. Syncing to a host computer is simple and straightforward, allowing project folders and data files to be easily saved. The Model GK-405 Readout is available with or without the Handheld Field PC because the Model GK-604-6 Field PC, provided with Geokon's GK-604 Inclinator Readout, is compatible with both systems.

For more information, please visit:  
[www.geokon.com/GK-405](http://www.geokon.com/GK-405)



Model 4900  
Geokon Vibrating Wire Load Cell



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