



White Paper

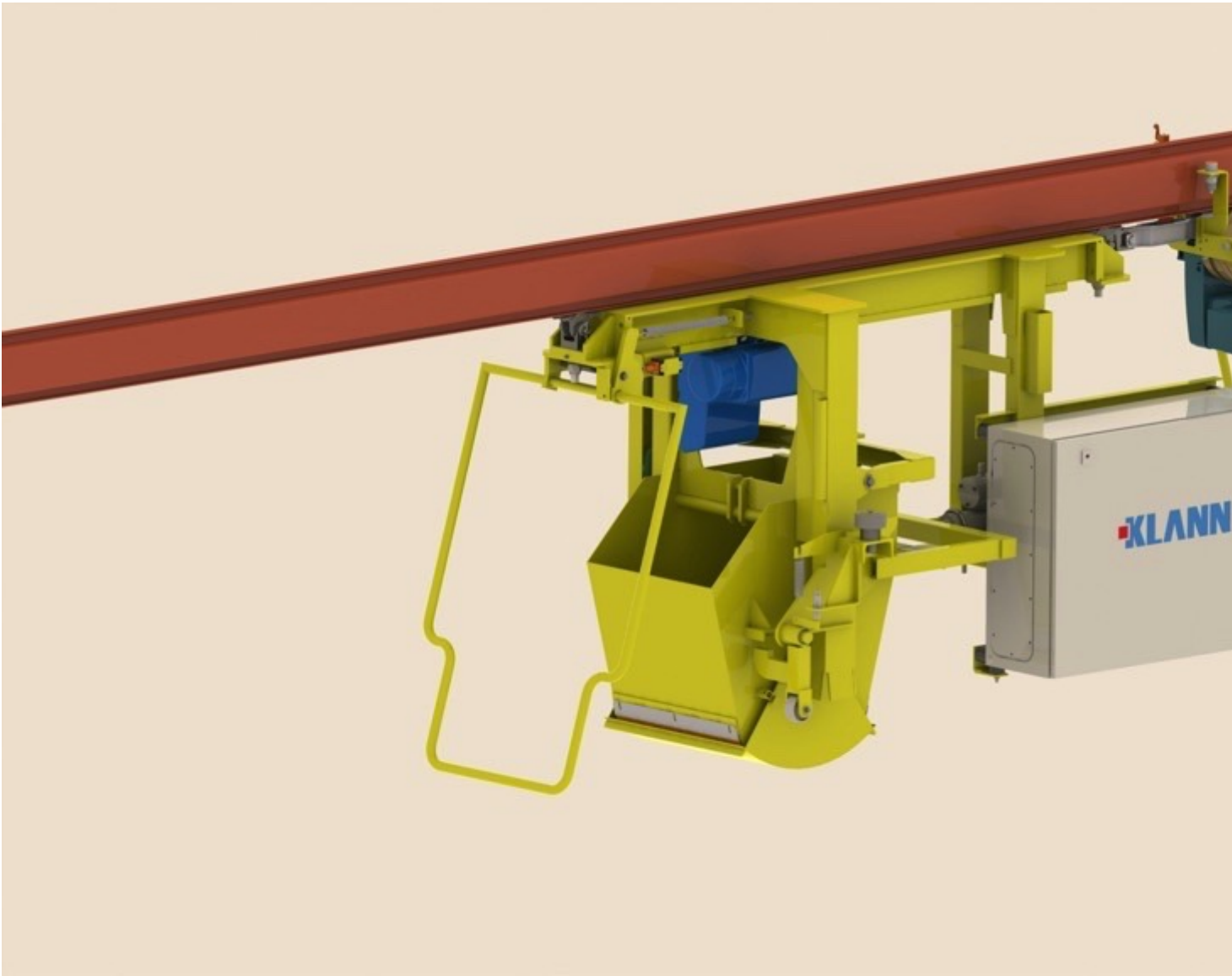
Accelerating the Sampling Process - Fully automated Monorail Sample Transport System for Iron Ore Samples

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In today's bulk handling with ship transport capacities beyond several hundred thousand tons it is of paramount interest to characterise the composition and constitution of the loaded material. Following, a system to accelerate the sampling process is presented.

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Animation of the transport cart
(Pictures: © Klann Anlagentechnik)

Besides precise sampling of bulk material, quick sample analysis is also often decisive for a quick response to changes in product. Automated sample analysis with robotic handling systems has already reached a very advanced stage, and the same is true of sample taking, e.g. directly from the transition chutes of conveyors. The transport of the samples taken occurs in batches and until now was a time-consuming step requiring personnel, since lab workers had to collect samples at the drop point. [Klann Anlagentechnik GmbH](#), from Hagen/Germany, has developed a new automated bulk material transport system, which is both secure and cost effective. It was first designed and tested in 2013 in Port Hedland's new ore loading terminal and has proven itself invaluable over the course of the last year. The system was built along the same principles as the very successful core sand transport systems that have been in use in foundries for decades, in which admixtures of sand and binding agents are transported from

mixers to the raised feed chutes of core shooting machines in batches of 10 – 50 kg.



Sample transport system in Port Hedland.

At the ore loading dock, iron ore samples of some 30 kg in weight are regularly taken from a transition chute during loading and diverted into the open bin of the transport system through another chute. The system consists of a bin transport cart, which is attached to a standard Demag KBK monorail by suspension rollers.

The transport cart is moved along the rail's curves and gradients by a friction drive. At the lab's sample unloading station the bin is automatically opened and emptied over an electrically operated bottom discharge flap. The transport cart then returns to the loading chute to receive further samples. In order to ensure that the system can handle curves and long distances, the transport cart is powered. The drive wheel is powered by internal power tracks and wirelessly remote controlled. Locks on the bin and collision safety loops increase the safety of the transport system. The simple suspension of the monorail from steel joists and the limited cross section of the construction make it a possible expansion for existing constructions. After seeing over a year of use in the harshest conditions, such as outdoor temperatures of up to 55°C and the dusty, corrosive environment of the ore loading dock, the Klann transport system has proved its availability in thousands of transports. Besides the horizontal conveyor system, the transport system is also available with a chain hoist, which can lift the bin several meters from the dispenser before continuing travel horizontally. Additional monorail sample transport constructions will be taken into operation in 2015 at Roy Hill Mine's new iron ore mine in Australia.

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A Note from the Editor

For all statements in this article that refer – directly or indirectly – to the time of publication (for example “new”, “now”, “present”, but also expressions such as “patent pending”), please keep in mind that this article was originally published in 2014.