

# IN THE NEXT ISSUE OF **C&a**

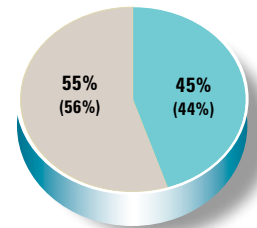


Place your products in front of **17,000 cranes, telehandler and access buyers & users** who will be reading the December/January issue of **C&a**...

The issue will include features on:

## Annual Rental Rate survey for 2020 and prognosis for 2021.

Forms for this year's survey have been sent out, the survey in its 18th year not only provides an indication of rental rates for the UK and Ireland, but also an update on fleet investment and rental company and contractor's prognosis for the year ahead.



## Scissor lifts

Scissor lifts dominate the self-propelled aerial lift market in terms of units, and amazingly more than 91 percent are now all electric, with developments likely to extend that still further as more manufacturers introduce electric Rough Terrain models and Chinese manufacturers become an increasingly important factor.

## Crawler cranes

The crawler crane market has been growing steadily in recent years, as telescopic models eat into the smaller end of the lattice crane market and custom heavy lift machines move into the top end of the market. Wind turbine developments are having an interesting effect on larger crawler crane designs and usage though.



## A look back at 2020

We take our annual look back at the year in terms of both the industry and the world at large. 2020 has been an unusual and interesting year so should make for a good read.

Send any information, news, photographs or ideas on these subjects to [editor@vertikal.net](mailto:editor@vertikal.net)

Every issue of **C&a** is also packed with our **regular columns** and **news** plus **reader's letters**, **books**, **models**, **training**, along with the latest news from the **CPA**, **ALLMI**, **IPAF** and **PASMA**.

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# Increasingly remote

The operation of machinery via remote controls has typically intended to allow operators to place themselves in the most beneficial position, in terms of safety and view of the work. With the advent of radio remote controls, operators are no longer confined to a stationary control point whether that be at the end of a trailing lead, in a cab, a platform, or at the side of a machine. More recently however it has also begun to take on a slightly wider meaning and purpose.

## From the ground up

A new Israeli remote control technology company UltraWis has recently completed its site trials of a remote operating systems for tower cranes called WideSite. We spoke with co-founder Lior Avitan to find out how the company has adopted similar technology used in military combat systems on fighter jets and by helicopter pilots to develop what UltraWis claims is the first remotely operated tower crane system on the market.

Prior to founding UltraWis in 2019 Avitan and Erez Gernitzky spent more than 30 years between them with Israel's largest defence company Elbit Systems, working on the technology behind its helmet mounted display systems used by military pilots. Most recently, Avitan was responsible for developing night vision sensor system BrightNite, while Gernitzky spent around 20 years working on imagery processing and algorithms. Given how the move into cranes might not seem like a logical transition, Avitan explains how the idea for WideSite came to him after spotting a tower crane at work while studying for a master's degree in 2016.

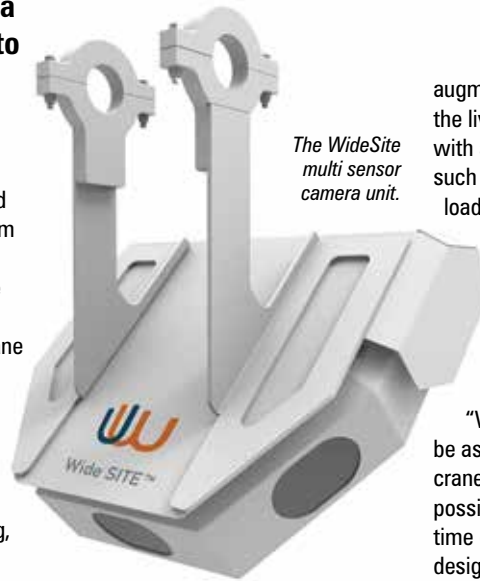
"Each day between my classes I couldn't help noticing the tower crane, how it was being operated and the deficiencies resulting from its restricted field of view. Right away I knew we could utilise the technology used to help pilots in their cockpits to assist tower crane operators – and that's when the idea for UltraWis was born."

Part of Incubit - Elbit Systems' deep-tech incubator - UltraWis began adapting military grade technologies in image processing, stability, 3D modelling, and augmented reality, to allow tower crane operators to remotely control the crane from a cabin or office located on site. Less than a year in the company was granted \$900,000 from Israel National Insurance Institute's Manof Fund. Designed to support a wide range of projects that promote safety in the workplace, it recognised the potential the system could have on preventing accidents within the construction industry.

Avitan said: "The Manof Fund understood that we were interested in improving the ergonomic environment of the crane operator as well as his safety and that of the team on site. The extra funds



Lior Avitan (pictured) is using military grade technology to help tower crane operators



The WideSite multi sensor camera unit.

augmented reality graphics over the live feed to provide the operator with a wide variety of information, such as hook heights, weight of the load and the projected location of load within a variance of just 100mm. It can also detect and notify the operator of other cranes or construction equipment that might impact the operation of the crane.

"We have designed WideSite to be as similar to operating a tower crane from the elevated cab as we possibly can. The addition of real time overlay graphics has been designed to be very intuitive and just as pilots no longer have to look down at the cockpit in order to fly, crane operators will have all the information they need on the screen directly in front of them."

## Outside in

Given the overwhelming adoption of remote control technology in recent years the development of a system like this seems an obvious step. What is more surprising perhaps is that it has taken a company from outside the industry to develop a working solution. Explaining why this might be the case Avitan said: "Before we started developing this solution, we asked the question as to why none of the tower crane manufacturers had developed such a system yet. I think part of the reason is down to manufacturers preferring to concentrate on the tower cranes themselves and improving their capabilities but mostly I believe it is because the system requires highly advanced imagery processing and sensing software to make it a practical reality. Very few people will have the knowledge and experience that we have in this area, or the ability to implement a proper working solution."

enabled us to add to our team and push forward to develop a working model for a construction site."

Designed to be installed on the jib of any make or model tower crane, WideSite combines a multi sensor camera unit with a replicated tower crane control station, two high definition screens and speakers. It has also developed a ground cabin but acknowledging that many sites will have their own space, can easily set up the control station in any building located within 300 metres of the crane. Making use of artificial intelligence and machine learning, the system constantly monitors the site and displays



(L-R) UltraWis founders Erez Gernitzky and Lior Avitan



WideSite allows tower crane operators to control boom movements from the ground





The system uses augmented reality overlay images to help notify operators of various points of interest

### Successful trial

As part of site trails UltraWis worked with Liebherr's Israeli distributor Top Engineering to install its system on a five tonne Liebherr 71 EC-B tower crane on a construction site near Hadera, north of Tel Aviv. The training of the tower crane operator took place within the ground cab and involved a series of theory and video based learning before hands on training on the remote system. "The system is very intuitive and after only 10 hours of using WideSite the operator informed us that he no longer wanted to return to the tower crane cab to work anymore!"

During the trial the company encountered a small number of challenges – chiefly around the level of vibration that occurs when lifting a load at the end of the jib which distorted the view. The addition of inertial measuring units (IMU) combined with a new algorithm however proved more than capable of stabilising the images. Avitan goes on to explain how the trials also provided a number of unexpected benefits.

"Our sensing unit has two cameras on either ends of the jib which provide 360 degrees of sight - essentially providing visibility of the entire site. As such we are able to monitor the whole area and have started pushing it out to cloud and mobile applications to give

customers visibility of the site as it progresses."

More than just providing a live feed of the site however the high tech motion detection system is able to track employee and equipment movements and, if required, notify management on a range of things like whether or not a person is wearing his safety helmet or hi-vis vest. It is also able to provide a heat map of where personnel have been located each day.

### Product rollout

Following its successful trial in Israel, the company is looking to carry out further trials in Europe and the USA and is holding advanced discussions with a leading - but unnamed - manufacturer, while also looking to target end users and rental companies by the beginning of next year.

Although the system is now available on tower cranes the company says that WideSite can be installed on a range of cranes, such as overhead gantry, marine and ship to shore cranes. As well as providing benefits in safety and productivity for a number of industries the company is also hoping that it might play a role in reducing the risks of lone workers. By having crane operators working from the ground and closer to others on site, it effectively eliminates the need to have complicated rescue and additional safe systems of work in place.



A lot of work was required to develop the drive and braking functions

## When millimetres count

**For a while now mobile crane manufacturers have offered remote control systems for setting up the crane and some boom movements – and in some cases boom movements of multiple cranes – however, in general they have not been capable of operating the crane chassis. That changed last year with the introduction of Liebherr's new RemoteDrive system - available on its 50 tonne LTC 1050-3.1 - which was developed in partnership with German crane rental company Salgert.**

By allowing the crane chassis to be driven from outside the cab, the new system offers the operator greater flexibility and improved visibility on job sites with limited space, such as the inside of an industrial facility. It also means the operator has a full view of the situation eliminating the need for a banksman.

Salgert managing director, Wolfgang Salgert, originally approached Liebherr to design such a system after constantly encountering restricted jobsites that relied solely on the operators view from the cab and camera systems. He says: "I had been looking for a way of controlling our LTC compact cranes by remote for many years. They perform 70 percent of their work inside or around industrial buildings where there is limited space. This means that we face situations every day where the crane operator cannot see the whole

picture."

After receiving similar feedback at Liebherr's Customer Days and following subsequent interest in the concept of the RemoteDrive system, Liebherr felt there was enough potential demand to turn the concept into reality.

### Persistence pays off

Although the RemoteDrive only required additional software on the crane and two master switches on the company's LICCON2 remote control system, its development was far from straight forward. Philipp Mang of Liebherr recalls the challenges: "Transferring all the required displays and controls for the operator from the cab to the remote controller posed challenges for us. We wanted to make sure that the machine could be operated as intuitively as possible, and above all safely. That meant that we had to get really creative."

Particular attention was required on the drive function as well as the ability to brake the vehicle safely which resulted in the addition of an electric braking valve. Armin Geiss from Liebherr's technical testing department, adds: "There were lots of different versions before we finally came up with a solution for improving the intuitive control and displays. Initially we expected that manoeuvring in first gear would deliver the greatest sensitivity. But in fact we found that using a higher



The system can be used to provide visibility and monitoring functions of the site in both 2D and 3D



Liebherr's RemoteDrive system is the first to remotely control a crane chassis

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gear is better because the forward motion is reduced as the number of gears falls. Another particularly important point was how to actuate the brake and when the engine speed had to be increased. Every test we carried out enabled us to learn a little more and the result was the first mobile crane in the world that can be manoeuvred by remote control from outside the cab."

#### Successful application

After taking delivery of the new LTC 1050-3.1 last Autumn, Salgert was naturally quick to test the new technology out on a job which involved replacing industrial machinery at an aluminium die-casting plant in Bad Münstereifel.

"It was the perfect job for our new LTC 1050-3.1 with its RemoteDrive," says Salgert operator Tony Göltzer, who became the first crane operator to use the production version of the system on a real job. "The difficulty was that the machines had to be moved in a low building with truly little space and which already contained other machines, while production could not be stopped. RemoteDrive enabled me to stand right next to the area with the greatest 'pinch points' allowing me to manoeuvre the crane safely through the space. The door was narrow and low, and we had installed the short erection jib. That meant I had to watch it pretty closely."



When millimetres count

As well as using the RemoteDrive system, Liebherr's VarioBase system was also employed to set the crane's outriggers at irregular positions between the facilities existing machinery and achieve the best capacities for the space available. After returning to the cab, the crane was also used to pick & carry machinery and components weighing

up to 18 tonnes from the building.

#### Future use

Since its introduction last year Liebherr claims that more than 50 percent of all new LTC 1050-3.1s are being ordered with the RemoteDrive option. It has also begun talking to customers in order to gauge what demand there might be to introduce it on other models in its range.

# Remote logging

Working in the timber handling and transportation industry is often physically demanding, hazardous and in many countries requires operators to work all day in harsh weather conditions. It is also a highly competitive market with increasingly stringent legislation leading to shrinking margins. Unsurprisingly, finding skilled drivers/operators that want to work in the sector can be a real challenge.

Hiab's HiVision system allows operators to control its Loglift cranes from inside the truck cab



A few years ago loader crane manufacturer Hiab set out to help improve the driver's lot with its HiVision remote control system. By combining four cameras with a virtual reality headset, HiVision allows operators to load/unload timber from the comfort and safety of the truck cab. The headsets provide a field of vision of up to 270 degrees - 30 degrees more than Hiab claims is usually required from a rear mounted crane cab - and features two joysticks mounted on the seat armrests within the cab. The company also claims the system reduces the physical demands and exposure to bad weather than traditional forestry cranes, making the industry more accessible.



Lars Norlings Åkeri has provided its services throughout Sweden for more than 80 years

#### World's coolest Grandma?

This certainly proved the case when new grandmother Åsa Norling of family run timber transport company Lars Norlings Åkeri came out of retirement in order carry on the family business while her son and

daughter in law cared for their new baby girl. But it only became a practical reality thanks to the HiVision remote control system. Established in 1937 by brothers Otto and Holger Norling, the company has provided timber and





Åsa Norling was able to come out of retirement to allow Emil to care for his new born baby

gravel transportation throughout Sweden for more than 80 years. The company purchased its first hydraulic timber crane - a Hiab Elephant 176 - in 1963 and more recently purchased a Hiab Loglift 118S HiVision. Third generation manager Emil Norling said: "When we first thought about buying a HiVision crane, we weren't really planning to invest right away. But from a safety and work environment perspective, it felt like the right thing to do."

Fortunately for Emil, the system also meant that his mother was able to come back to work operating the timber trucks while he took some paternity leave. For Åsa it was a case of déjà vu having begun operating the trucks and their cranes in 1995 after her husband

Lars Norling was seriously injured in a car accident. She took over the running of the business while he recuperated. Although Åsa is officially retired and a grandmother she is enjoying driving the trucks and operating cranes again, especially as she can do it from the comfort of modern truck cab.

**Next generation**

Emil Norlings Åkeri believes the introduction of HiVision has the ability to attract the younger generation to the timber transport industry going forward and maybe, who knows, even his new daughter? Recently Hiab supplied the Savo Vocational College in Finland with a Hiab Loglift timber crane with HiVision control system. According to college tutor Ville Remes, the system is already helping

transform what is traditionally a male dominated sector. He says: "Some of the students have chosen to study at the college due to the selection of state of the art technological tools we have here, which can make operating a crane resemble a computer game. This has proved to be a huge draw with the younger generation as they are able to relate to the industry more easily."

In another example, Sofie Tjus Ekström, a timber truck operator from Kjell & Aste Åkeri in Sweden - who trained with a number of other female operators - said: "It has nothing to do with how strong you

are, technology makes it accessible for everyone. Now it is no longer necessary to climb over slippery, icy logs in the winter or take the risk of being near heavy traffic when operating next to a major road. Everything can be operated from inside the truck cab."

As well as looking to introduce this technology to other products in its range Hiab hopes to develop a solution that enables operators to operate equipment remotely from greater distances, without ever needing to get in the truck at all. With self-drive trucks on the horizon this may be more likely than it might sound.



HiVision is helping transform traditionally male dominated sector

# One for the future

**With each new development in remote control technology we are seeing how operators are able to better and safely position themselves in the very best location, in terms of view and safety, however the next steps may well remove the operator from the site altogether.**

Working towards this goal Kobelco has teamed up with Microsoft and Leica Geosystems to develop its K-Dive Concept which it hopes will create "human-centric work reform" using information and communications technology to provide "attractive environments where anyone can work".

In short, rather than pushing for an automated future it hopes its K-Dive system will allow operators to remotely control equipment from say an office building. The first step will likely see the office located on site, however the eventual goal is for long distance remote control to be practical. Other features of taking the system online will be the ability to provide visibility on ordering, operator contracting, progress data management and project progress evaluations etc...

"Because construction sites are labour intensive, productivity is low and there are also accident risks," explains Yoichiro Yamazaki, general manager

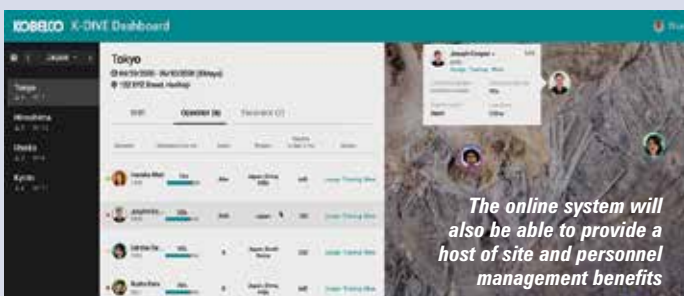


Kobelco is currently working on 'human-centric' control technology

of Kobelco's business development department. "Construction sites are generally not attractive workplaces for younger people, so the number of skilled workers is decreasing as the population ages."

"There was talk of automation at the beginning, but many construction workers take pride in performing work that remains on the map for many years. If automation reduces the number of people who work at a site, that pride will be lost. We want to create workplaces that are attractive to young people, where improved productivity earns higher salaries and with work styles that people who take pride in their work can accept. This was the philosophy that created K-Dive."

Although K-Dive is currently being developed for Kobelco excavators it not inconceivable that the technology could be used on lifting equipment next. Certainly one to keep an eye on.



The online system will also be able to provide a host of site and personnel management benefits