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Taking control wirelessly



Over the past 10 years the use of wireless remote controls in the construction industry has grown exponentially. In Europe alone between 60 and 90 percent of all loader cranes sold now include remote controls. **Cranes & Access** takes a look at the benefits of recent developments and reviews some of the latest systems to enter the market.

One of the first examples of a crane using wireless remote controls was built in the late 1950s, however it was not until recently that remote controls in the lifting industry - and to a lesser extent the access industry - have become mainstream. The strong surge in acceptance and usage within the industry can almost certainly be attributed to technological improvements, availability and price. Design improvements have been steady and consistent, with remote controls becoming more user friendly and reliable while incorporating more sophisticated features and functions. This in turn has opened up new possibilities for the equipment for a wide range of diverse applications.

The most obvious benefits of using remote controls include improved safety, increased efficiency and greater control. An increasing spread of lifting equipment for the construction, utility and rental sectors now include a remote control option, while very few volume machines provide it as standard. Is this a sign that the industry is hesitant to fully adopt this technology or is it just uncertain of its potential?

Bespoke controls for endless applications

Remote control manufacturers are able to tailor controls to suit specific applications, ranging from hand-held single function controllers suitable for overhead gantry cranes to large multi-functional controllers which can feature in-built live video



A 'portable' shortwave radio transmitter being used to control a crane in 1959



monitors, an array of joysticks, paddle levers, toggle switches and pushbuttons for use with large tower and hydraulic cranes. The use of modular systems allows manufacturers to customise remote controllers to suit almost any applications and meet most bespoke requirements.



From single to multi-functional remotes and everything in between.

Safety/Positioning

The major benefit of using a radio remote is to free up the operator from being fixed to a stationary control point or trailing lead - whether that be a cab, operator platform, or simply the side of a machine. They are now able to move freely to find the most suitable position for carrying out the manoeuvre, ensuring they have the optimal view. If a crane is needed to lift a load over a wall or onto a roof for example, operators are now able to move to these positions to closely monitor the lift. Operators need not be so reliant on banksmen, hand signals and radio commands either as they can now position themselves close to the load and within normal talking range of riggers and lift managers etc...

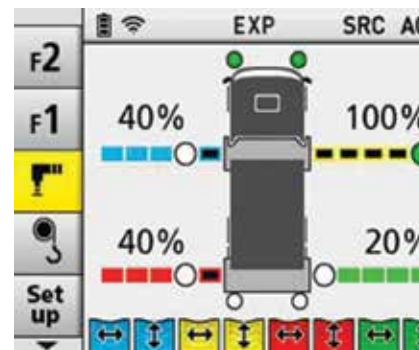
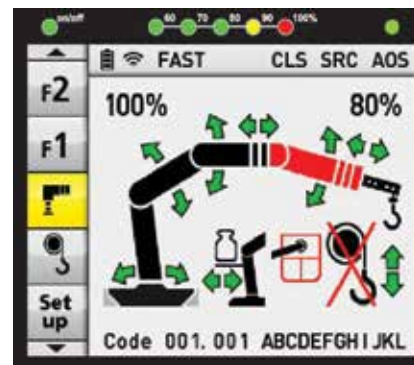
Duncan Phillips, national manager of Gough Palfinger New Zealand, said: "It's about convenience and safety. Remote controls have a radius of operation up to 100 metres which

means the operator can keep out of harm's way. On old-style cranes with lever operation, you had to have another person telling you how to move the load around. With remote control an operator can put the load exactly where he wants it. There is no need for the other person. Unfortunately there are customers who want

absolutely all the tech and safety features you can have and others who simply want what they had 10 years ago."

Information at your fingertips

As remote controls have become more sophisticated and mainstream the information provided for operators on the controller has grown. Most functions and features which they have become accustomed to in a fully equipped cab can now be transferred on the remote control panel. Various liquid crystal (LCD), thin film transistor (TFT), touch screen and live video displays, along with LED lights and



Operators have more information at their fingertips than ever before.

A Bobcat telehandler equipped with a 360 degree cement pump being controlled by a remote control



vibration alarms, all play a part in keeping the operator fully informed and in control. The display screens provide an array of feedback and system information, ranging from simple status and error messages to full graphical displays of lift capacity, boom height and outreach as well as safe working envelopes and other information. Remotes can also be configured to start and stop vehicles, change engine rpm, operate outriggers, control the vehicle's lighting and identify and configure attachments.

Safety Features

Whether fitted as standard or as an added option, controllers tend to have as many safety features as they do buttons and switches. HBC-radiomatic for example has its shock-off, zero-g and roll detect features which prevent unintended movement commands from being given to the crane/machine by deactivating it following a hard impact or if it is dropped or thrown. Like some telematics systems on the market HBC-radiomatic also offers a user identification card system to protect against unauthorised use as well as being able to store various operational data of the machine for each user. More general safety features include vibration and audible alarms, emergency stops, reverse previous movements, pre-set speed functions, dead man switches and orthogonal drive - which prevents operators from making

unintentional diagonal movements by ensuring the joystick is fully returned to the zero position before another directional command can be activated. There are also acid-proof and explosion-proof controls on the market designed for harsh working conditions and explosion-endangered areas.

Aerial work platforms and telehandlers

When it comes to the use of remote controls on aerial work platforms you might be forgiven for asking yourself – what's the point? After all, the operator is confined to the basket so why add the complication of remote controller? Well for self-propelled units of any kind loading or unloading and driving through narrow doorways is made significantly easier and safer. By operating the unit from a distance, where the view is better, the operator is not exposed should the machine slip off a ramp etc...

For those machines with outriggers the use of a controller can make a more complex set up or cribbing a breeze. There is also a growing trend for the main control panel to also operate as a remote, with the controller attaching/detaching into a bracket within the platform, allowing for the best of both worlds. The use of remote controllers on telehandlers is still quite rare, although there is a growing use for them when used in conjunction with various attachments.

HBC-radiomatic's user identification Smart Cards prevent unauthorised use



Autec's FJM wireless remote developed for Cela removes fire-fighters from working in potentially dangerous environments

Fire control

There are some applications where, for safety reasons, it is imperative to use remote controls. Radio remote control manufacturer Autec recently adapted its Dynamic series FJM remote control for Cela's fire-fighting range of truck mounted aerial ladder lifts. The system enabled fire fighters to operate the machine's boom and water/foam hose from heights of up to 72 metres (depending on the model), removing them from harm's way when it came to extinguishing fires.

Tandem lifts

Last year Rendsburg Port Authority successfully completed a tandem lift in German using two Gottwald mobile harbour cranes, a wireless remote controller and a single operator. Using a 100 tonne Model 3 G HMK3405 and a 150 tonne Model 8 G HMK 8610 harbour crane, both installed with Terex's Tandem Lift Assistant software, the operator was able to wirelessly lift a lock gate weighing 236 tonnes. The control was specifically configured to operate both cranes simultaneously, with data being exchanged between the cranes via a secure wireless LAN. Particular consideration was needed to eliminate unequal loadings, lateral pull, overturning and fluctuating speeds.

Two mobile harbour cranes, a wireless controller and a single operator



Battery life

Aside from cost, past issues with wireless remote controls have been battery life. However, new battery technology means that some of the more basic controllers can now offer up to 40 hours continuous use, while even the most demanding controllers - in terms of power usage - last between eight and 12 hours before they require charging - ie a full working day. In addition to the improved lithium-ion batteries, the use of more efficient charging docks and additional battery packs have generally overcome this issue. Most remotes on the market are able to monitor battery life and notify operators when a battery is low with the use of LED lights or vibration alarms.



Additional integrated batteries allow for extended and uninterrupted use

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"Syrinx has certainly brought all of our information together into one database and improved the efficiency of our business from start to finish." Phil Mitchell



"When we were undertaking due diligence on the acquisition of another powered access company, who were already using the Syrinx system, we noted that Syrinx gave them a number of operational and financial functions that we didn't have with our existing system. Kimberly Access are a focused operational business and so this excited us. Syrinx is now set up as our group rental system and Higher Concept Software have exceeded all our expectations in terms of the product and their customer service." Ray Ledger



"Our previous system was fraught with difficulties and not backed up with good service. It was a big decision to contemplate getting a new hire management system but we were so frustrated we had no other option. We were pleasantly surprised at how smooth the implementation of Syrinx was. We have been impressed with the excellent project management and exemplary training backed up by excellent support." Alistair Jordan



"We chose Syrinx because of its stability and reliability - a great improvement on our previous system." Malcolm Bowers



"Raising the standards in the Crane industry." Tim Ambridge



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SYRINX

Palfinger goes it alone

Last month Palfinger became one of the few manufacturers to develop and manufacture its own radio remote controllers.

Aimed at the European market its new PALcom P7 range of loader crane controllers has been initially developed for its SH-series of loader cranes, ranging from its PK42002 to its PL200002L. Available with either a small or large control box, with up to nine linear levers and three joysticks the company claims that it is the first controller in the crane sector to feature a 4.1 inch TFT colour display. Information displayed includes the crane's working envelope, outrigger spread, boom height and outreach, working capacity and an icon which shows which, if any, attachments are in use. Other features include its PALdrive menu button for display navigation, easy customisation and a roll-over and acceleration sensor which prevents unintentional



Shoulder straps with large areas of padding ensure operator comfort.

PALcom P7 – the first range of radio remote controls to be developed by Palfinger



movements. In its reduced power consumption mode the company claims the remotes have a battery life of up to 12 hours continuous use. Its charging station detects the battery's condition and temperature before delivering a measured charge.

When asked about Palfinger's decision to develop its own remotes, product marketing manager, Peter Lukas said: "The main reason was to design a completely new type of radio remote control, tailor-made for loader cranes. The second reason was system integration, in which we were able to offer the customer the perfect interface for

our products. When we started developing the PALcom P7 we realised that while we had long-standing experience in the field of electronic innovations, we did not have enough specialist knowledge relating to plastic engineering, radio technology and ergonomics. Our special development department therefore collaborated with external specialists, to develop a completely new solution."

In the coming months Palfinger intends to launch a controller for the remaining models in the SH-series and has said that it plans to develop the range of controllers for the US market in the near future.

HBC innovations

HBC-radiomatic's latest products include its Spectrum E controller and live video feature system - Photon. Spectrum E is HBC's largest and most sophisticated controller in the Spectrum series and is intended for diverse and complex applications. The unit is available with up to six joysticks or a combination of joysticks and linear levers as well as push buttons and various types of toggle and rotary switches.

Features include a rechargeable lithium-ion battery - which the company claims offers up to 18 hours continuous use - a redesigned compact housing unit weighing just 3.5kg and a 3.5 inch TFT display



HBC-radiomatic's new high performance Spectrum E

which, as well as displaying the machine's data can be used with HBC's new live video feed feature Photon.

Photon is available as an optional addition to its Technos 2, Spectrum D and Spectrum E controllers and can display up to eight live camera images. The cameras can be installed anywhere within a 150 metre range and the flick of a switch displays each individual feed or provides a four way split-screen. The cameras can also be used in limited lighting as an infrared function changes its colour image to greyscale making it suitable for night operations. Currently the Technos 2 controller is the only model with the option to switch to a graphic screen, however the company has confirmed it is developing its Spectrum D and E controllers to incorporate it.

Available in analogue (5.8GHz) and digital (2.4GHz) the company said that the analogue cameras are best suited when controlling machinery while the digital cameras are best



HBC-radiomatic's photon allows up to eight live video feeds to be display

for surveillance tasks. The digital version also features a lithium-ion battery which offers up to 15 hours continuous operating time.

Also worth a quick mention is HBC's single-handed remote control system - Pilot. Based on an integrated inclination function which responds to directional movements the system works in a similar fashion to a Nintendo Wii controller. By using the horizontal and vertical inclinations of the transmitter the operator can control two machine functions at once. The more the transmitter is inclined, the higher the speed. A rotary switch also allows additional functions to be selected with safety features including

pre-determined speed limits, user identification and a safety release function whereby if the release button is not pressed no control commands can be activated by the inclination function.

Recent applications of the pilot controller have included use on spider cranes



Stella's CDTplus radio remote for its telescopic truck cranes



Stellar remotes from Hetronic

Truck mounted hydraulic crane manufacturer Stellar Industries has recently turned to Hetronic to provide a bespoke controller system for its new range of heavy-duty telescopic service cranes with capacities ranging from 3.5 to 6.3 tonnes.

The Stellar CDTplus (Crane Dynamics Technology Plus) controller is a lightweight handheld transmitter featuring seven control levers, a proportional speed trigger and an LCD display. The display provides real-time feedback on the crane's load capacity and maximum outreach as well as the current load,

boom angle, and remaining reach and capacity. The system also alerts the operator when a load is nearing full capacity via built in visual and sensory indicators, including gradually increasing vibrations to insure the operator is aware of an approaching overload whilst keeping an eye on the load. An innovative Boost Mode also allows the crane to operate at 118 percent of normal operating capacity for a short period of time, whilst its Safe Mode allows the operator to work at reduced speeds should a load indicating device fail to operate correctly.

Magni telehandler remote

Magni has developed a new wireless remote controller in conjunction with Autec that can be used to operate its telehandlers from the ground, or within a platform attachment.

The new controller has been colour coded to differentiate between its four functions. The yellow section operates boom movements and attachments with the ability to control up to six independent movements when used with specific attachments. Its pink section controls the telehandler's outrigger system with the option to deploy all outriggers at once or one at a time.

The blue section operates the telehandler's transmission and



'Magni' placed over 'RTH'; caption: Magni's colour coded controller

movement. With the use of a dead man switch it is also possible to drive the telehandler from the aerial work platform attachment with speeds of either one or five kph possible so long as the boom is forward facing and no higher than three metres.

Magni says it is also working on a controller with an interactive display which will show selected functions, alarms and information that is usually available in the cab.

C&a remote controls

Konus modular system

Scheduled for release in July, German remote controller manufacturer Konus NBB, is set to launch its new generation of Nano-M SMJ modular remote controllers.

The new transmitter consists of three parts in which varying upper, lower and middle parts can be selected to create a totally bespoke controller to suit the customer's requirements. The upper part can be selected with or without a 4.3 inch colour display, the middle part with an array of toggles, joysticks or levers, and the bottom part with the choice of different connection and battery possibilities.

Its range of controllers comes with two 7.2V rechargeable battery packs which can individually be removed and charged without disrupting the workflow of the machine. Each battery runs for 30 hours (depending on the configuration) and is available with self-cleaning contacts. The company claims it can be recharged in an hour and that its temperature sensing provides



The controller's upper, lower and middle sections are individually selected to cater for all modular demands

optimised recharging.

Measuring 350mm by 230mm the controller weighs 3.5kg and is water proof to IP65. Its high RF-output up to 10mW on the F-Band and up to 25mW on the G-Band means that machines can be operated from a range up to 300 metres and its frequency can be selected manually or automatically.

Its SMJ (Surface Mounted Joystick) technology allows joysticks to be changed without opening the transmitter housing allowing replacement on-site with minimal training.

Liebherr develops Bluetooth system

Liebherr's increasingly popular Bluetooth mobile crane control system continues to be developed. Its LICCON and BTT operating and display system provides operators with load indication, warning displays and crane utilisation.

The touch-screen display is also able to control the carrier drive and steering programmes, the suspension and outrigger systems as well as the cab's heating, floodlights, and climate control. Standard features includes outrigger activation, engine start and stop and speed

control with electronic inclination display and automatic outrigger levelling. Additional features include a readout of outrigger ground pressures, the ability to mount extensions or counterweights and the display of mileage and working hours when plugged into the carrier cab during road travel.



The crane driver can attach and detach the hookblock from the front bumper by remotely controlling the hoist winch and boom lift cylinder