



# Spread that *market share*

## **World Port Development takes an in-depth look at the world of the spreader and components**

**W**hen describing the spreader market three words spring to mind: buoyant, innovative and competitive. The latter is probably the result of over-crowding; at least six important suppliers are on the market. When talking about competition there are two major issues: price and technology. According to Werner Meyer, Sales Manager, SMAG, Germany, price plays a major role in any decision, but he believes you have to make a clear distinction between 'ship-to-shore' and the 'other' market segments in seaports. "Within the 'ship-to-shore' market segment the [operator's] decision will be [determined] quality. This kind of market segment is very sensitive against downtimes," says Meyer. "The speed of the cranes is increasing more and more and so there is no space for a delicate spreader. The 'other' market segments for normal requirements are more price aggressive, but the additional costs for less reliability, more maintenance and services as well as the longer response of the supplier will overtake the costs of a low price spreader,"

he explained. Market segmentation is another issue, which can be examined by looking at the mobile harbour cranes market. Meyer explains that MHCs require lighter spreaders with the same specifications as ship-to-shore spreaders. "For this reason we (SMAG) are developing a new mobile spreader for the highest requirements. We will present a weight less than nine tons with unchanged physical conditions and modern technologies," he says. In general, SMAG uses bus-technology and a reliable, durable and intelligent PLC on all its spreaders, which are also equipped with rubber buffers in all-important areas to minimise noise and absorb shocks. "Maintenance friendliness and security aspects provide our customers a high surplus value," Meyer says. "One of our strengths is that we can react promptly to special customer requirements." SMAG also offers operators the chance to monitor spreaders, providing information about the fault diagnostic, and making a problem far easier to notify or isolate. Within the system, maintenance becomes hugely simplified; as such details as intervals for lubrication and oil replacements can be displayed to the operator, as can the need to replace wear parts. A remote diagnosis is available to assist less trained staff. Despite the market's fierce levels

of competition, Meyer is upbeat about the future, with orders placed for MHCs in England and Germany, and for a ship-to-shore spreader from an undisclosed terminal in Hamburg, Germany. But the biggest order came from a truck crane manufacturer for 30 units and an option for a further 20 units of semi-automatic spreaders. These MHC order levels are not isolated to SMAG, with this generally seeming a growth area, and Smits Spreaders Systems, the Netherlands, has also been successful in penetrating this particular market. Smits recently announced that a unique spreader has been installed on one of the mobile harbour cranes at the Port of Rauma in Finland. The twin-spreader (SWL 2x 25 tons) is believed to be the first spreader ever that is equipped with both longitudinal and traversal adjustment. The traversal adjustment feature is useful for ro-ro ships with lo-lo capabilities on the upper deck and for the smaller feeder vessels. It facilitates the (un)loading of containers when the ship lists, and will allow the crane driver to position the spreader and containers under exactly the same angle as the ship deck or ship cells. Positioning the containers at an angle, even immediately adjacent to each other, is possible with this feature. Several other stevedoring

companies and ports have expressed their interest in this high tech spreader, and Smits expects to seal more orders for this type of spreader in the near future, having also confirmed that the development of a heavier version with a SWL of 2x 32.5 tons is nearing completion. It's innovations such as these that can enhance market positions, and indeed make the market so competitive in itself.

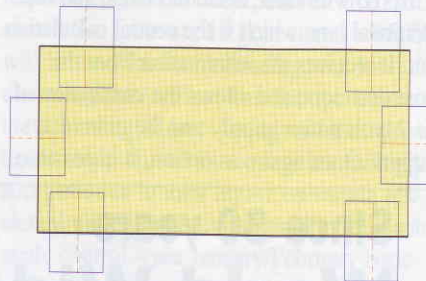
### Key to success

It is testament to the strength of Swedish firm, Bromma's current position, then, that the company apparently has no problems producing more than 1,100 spreaders per year. Bromma has six manufacturing units, with primary production being of telescopic spreaders at factories in Scandinavia and Asia. Underpinning this mass-production, Bromma claims, is an expanding product portfolio with the spreader industry's largest research and development budget. This bold claim is backed by a history of evidence, with the Swedish firm boasting a proud tradition of innovations: the first telescopic spreader; the first twin-lift spreader; the first all-electric yard crane spreader; an industry-standard spreader safety system, the TTDS twin-twenty detection system; the MPS memory positioning system; the SCS<sup>2</sup> spreader communications system; and the new Tandem line of spreaders, capable of twin-40-foot container handling. The company's largest single order ever was received recently from South Korea - a contract from Chinese container crane manufacturer ZPMC for 24 STS45 separating ship-to-shore twin-lift spreaders, which will be delivered on ZPMC cranes to Pusan Newport Company. In addition, four Bromma HSM6 overheights have been purchased for service at Pusan. The Port of Pusan is one of the largest container terminals in the world. The technical specifications for the spreaders being delivered to Pusan include Bromma SCS<sup>2</sup> spreader condition monitoring and fault diagnostics technology, TTDS Twin-Twenty Detection System technology and HIS Height Indication System technology. The SCS<sup>2</sup> technology

continues to be a major factor in Bromma's approximate 70 per cent share in the global independent spreader manufacturer marketplace. Bromma now has more than 2,000 SCS<sup>2</sup> nodes in service at terminals around the world (depending on the spreader's configuration, each spreader has 1 or 2 nodes). Deliveries to Pusan New Port will begin later this year. Bromma recently assumed consolidated production responsibilities for the production and design of all spreaders manufactured for sale by Kalmar Industries, Sweden, including spreaders for reachstackers, straddle carriers, RTG cranes, and empty container handlers.

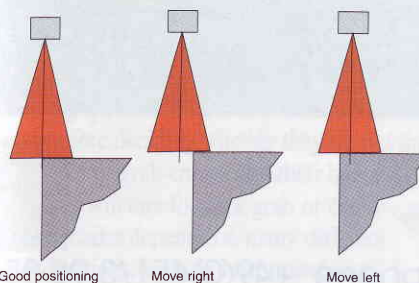
### New technology

With the increased use of high-tech spreaders comes extra urgency on the need for companies to develop new systems. French company, Arck Electronique, has recently launched its new spreader positioning system SP16 and SP13. The SP16 sensor is dedicated to container detection under the spreader on harbour

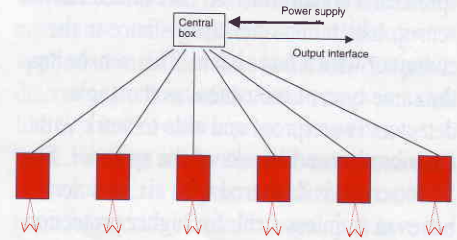


Drawing no 2: Detectors installation on spreader

cranes. Its purpose is to help the crane driver adjust the hoist position in order to pick-up the container, thus overcoming the problem incurred when adjusting the position of the spreader if it is swaying, and saving time. It can also be used on unmanned cranes, where the spreader should be automatically positioned to pick up the container. The sensor analyses the spreader position above the container, and provides some indication to the crane PLC in which direction to move to get the right position, and will also confirm if the position is correct. SP16 is an optical sensor, which uses three or six infrared detectors, depending on the type. These detectors look downwards and measure the position of the edge of the container in regards to an optical centre (See drawing no 1). The optical view angle is +/- 8. This allows a square optical detection area of +/- 250mm on each side, at a distance of 1600mm. This also allows a 100mm gap between two rows of containers. The sensor will be placed at a certain height along the spreader sides (typically 150mm far from the spreader lower surface) to guarantee a +/- 50mm square when the



Drawing no 1: Container edge detection



Drawing no 4: Connections

spreader arrives at the point 200mm from the container. Arck offers two solutions by using six or three sensors.

On the six-sensor system, two sets are placed along the seaside of the spreader, two others along the landside, one on the left side and one of the right-side (See drawing no 2). This is a complete solution, and is useful when the containers are not all of the same type.

The use of two symmetrical sensors makes 'differential detection' possible, with the central computer distinguishing between each position. Therefore, if the container width is smaller than the standard container, the set of two sensors will always give the container position. When the container is at the exact position under the spreader all six detectors have a '0' state. Each state is 0 when the container position is centered with a tolerance, which could be factory defined (typical +/- 15mm at 200mm distance). If the spreader is moving, some sensors will have a state '+1'.

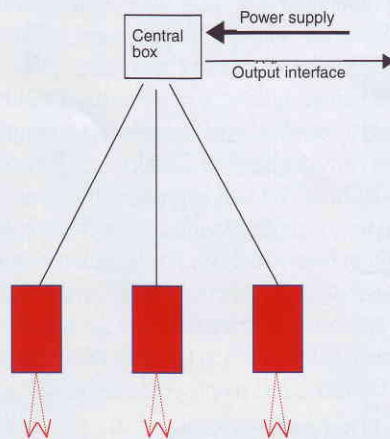
A central computer dedicated to the system analyses the state of every sensor and calculates the state of the spreader as follows:

- no container detection
- bad detection
- spreader centred on container
- right side of spreader to go landside (SpRi ->LS)
- right side of spreader to go waterside (SpRi ->WS)
- spreader to go left side
- spreader to go right side
- left side of spreader to go landside (SpLf ->LS)
- left side of spreader to go waterside (SpLf ->WS)

If many movements are necessary, information of these movements will be activated at the same time. When one side of the spreader should move alone, only one of the SpRi or SpLf is activated, to move the spreader for position adjustment. If two sides of the spreader need to move in the same direction, both outputs are activated, and this should be interpreted as a trolley movement. As option, it is possible to deliver distance information,

giving the gap between the container and the spreader. This information is obtained from a sensor, which measures the distance to the container with a laser beam. This sensor has the same type of robustness as the angle detectors: waterproof and able to work with the vibration and shocks of the spreader. The SP16 sensor is delivered with six detector boxes in stainless steel, for higher protection against shocks, vibration, rain and corrosion. An additional box is the central calculation unit. It receives the information from the six detectors, and allows the connection to the 24volt DC power supply and the nine relays outputs. This central box is installed on the hoisting system. It is waterproof, but should be installed with shocks absorbers. A connection is designed from the spreader to the hoist to allow disconnecting when changing the spreader. This will be analysed case by case with the spreader manufacturer. Installation of each detector should be made in accordance with Arck to assume the following rules:

- ▶ detectors installed are in perfect vertical orientation (looking down)
- ▶ detectors installed on the spreader at the six positions defined in drawing no 2
- ▶ detectors positioned inside the external part of the spreader with a protecting sheet steel



Drawing no 6: Connections

To use three sensors (product SP13), one sensor is placed along the seaside of the spreader, two others along the landside; one on the left side and one on the right side (see drawing no 2). This system is most effective when the containers are all of the same type. The SP13 sensor is delivered with three detector boxes, and one additional box, which is the central calculation unit. It receives the information from the three detectors, and allows the connection of the 24volt power supply and the nine relays outputs. Once again, as option, it is possible

to deliver distance information, giving the gap between the container and the spreader. This information is obtained from a sensor, which measures the distance to the container with a laser beam. This sensor is also the same type of robustness as the angle detectors: waterproof and able to work with the vibration and shocks of the spreader. Output is the same as with the six-sensor solution. Information on any sales or orders for the product was not available at the time of going to press, but rest assured that over the years Arck has been proven to come up with new ideas for crane drivers.

### Fighting their corner

As the buoyant spreader market forces manufacturers to come up with innovative (and technological) ideas, the price of spreaders is conversely spiralling down due to competition. Business guile and engineering brilliance are both must-have characteristics for any manufacturer hoping to succeed in these surroundings. But while balancing technological development and economic solutions is possibly the ultimate challenge for any supplier, it is clear that, when this is achieved, the benefits on offer within the spreaders sector are bountiful enough. WFO



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**ORTS GmbH Maschinenfabrik**

Schwartauer Straße 99  
23611 Sereetz - Germany

[www.orts-greifer.de](http://www.orts-greifer.de)

phone +49(0)451/3 98 85-0  
fax +49(0)451/39 23 74  
email [info@orts-gmbh.de](mailto:info@orts-gmbh.de)

[www.orts-grabs.de](http://www.orts-grabs.de)

