

VISY TOPVIEW – A NEW ANGLE FOR TERMINAL AUTOMATION

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Container terminals use a variety of equipment to move and stack boxes: large ship-to-shore cranes at the quayside, gantry-type RMGs and RTGs, mobile harbour cranes, and reachstackers roaming in the yard area. Despite the clear differences in the various types of container handling equipment (CHE), the common denominator is that they all move containers with spreaders. In fact, a spreader touches every single container that arrives or leaves a terminal via the quayside or is moved within the yard. Therefore, turning the spreader into an automated smart device presents a multitude of benefits for operators.

UNIVERSAL SPREADER OCR SOLUTION

Visy TopView is a universal optical character recognition (OCR) solution that fits any type of spreader on any CHE. TopView automatically gathers images for recognition data while the spreader is in action – regardless of the time of day or environmental conditions – making it a reliable tool for terminal operators in container handling processes. TopView is

now a standard offering in all Visy ship-to-shore OCR systems.

Using the latest camera hardware and artificial intelligence software, TopView transforms every spreader into a smart device and gives the CHE a set of ‘eyes.’ The wide feature set which drives process automation saves operators time and money on every box move. Those features and benefits include:

- Container ID recognition
- Visy ADDS – Automatic Container Damage Detection System
- Communication with TOS and other third-party systems
- Early alerts for wrong moves
- Verified stack integrity
- Improved safety due to less manual work around the cranes
- Twin-20 detection system

TopView takes high-quality images of the roof of each container and utilises vision technology to automatically extract the container IDs printed on the roofs. Because the system is installed directly on the spreader, the images are captured wherever the spreader goes, regardless of

the container flight path.

When the spreader picks up a container, TopView has already captured the container ID and other pertinent information from above. The digitised data is then automatically shared with the TOS or other third-party systems, and the move is verified. Clerks no longer need to manually verify box IDs. TopView automatically collects and shares the data as required.

RUGGED HARDWARE

Each spreader is equipped with robust cameras, LED illuminators, cabling, and a device cabinet. The system works in every environment, from the high winds and freezing temperatures of the subarctic climate of Visy’s native Finland, to the heat and humidity of the tropics. The first TopView system was deployed in 2018 and is still in operation.

TopView supports all makes and models of spreaders, including single, twin, tandem, and quad. The system can be installed into new spreaders at the factory, or as a retrofit onsite. Depending on operational requirements, TopView works both as a standalone solution and in cooperation with other Visy Crane OCR products. TopView delivers results regardless of whether the operation commences over vessel, truck, train, or yard.

It’s no secret that spreaders are subject to harsh treatment including shaking, vibration, knocks, and hard collisions. Recent developments in the durability of cameras play an important role in the versatility of modern OCR

“VISY TOPVIEW IS A UNIVERSAL OPTICAL CHARACTER RECOGNITION SOLUTION THAT FITS ANY TYPE OF SPREADER ON ANY CARGO HANDLING EQUIPMENT.”



systems. Vehement environmental factors no longer limit smart camera applications. The TopView system does not require any special support or maintenance beyond that of a standard OCR setup.

CONSTANTLY EVOLVING SOFTWARE

Artificial intelligence and vision technology have become mission-critical components in modern container terminal operations. With the huge numbers of moves that happen every day in a terminal, the financial implications of the difference between 95 per cent and 99 per cent accuracy in an OCR system can be astonishing. Therefore, Visy guarantees industry leading OCR read rates on every project.

Continuous investments in R&D have enabled Visy's OCR software, powered by an in-house deep neural network (DNN), to provide

exceptional results. Utilising a state-of-the-art DNN provides a faster, more accurate, and more efficient way to extract data from images. The system recognises worn, scratched, and only partially visible numbers faster and more accurately than a human.

In addition to recognising characters, the versatility of vision technology is astonishing. Modern DNNs are taught to recognise virtually anything from an image. For example, the same image set that is utilised for container OCR is also utilised for twin-20 detection. All the data that is extracted from images is automatically digitised and used in process automation.

DAMAGE DETECTION AND IMPROVED SAFETY

One of the revolutionary aspects of vision technology is the Visy Automatic Damage Detection System (ADDS). TopView collects

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Visy TopView

damage inspection images of the roof when the spreader locks on to the container. The damage condition of each container is therefore recorded even before the terminal unloads it from the vessel. The TopView images themselves help operators refute damage claims because they have photographic evidence that the container was damaged before it arrived at the terminal. Furthermore, due to the proactive nature of ADDS, the system can be programmed to create an exception handling event for severely damaged boxes.

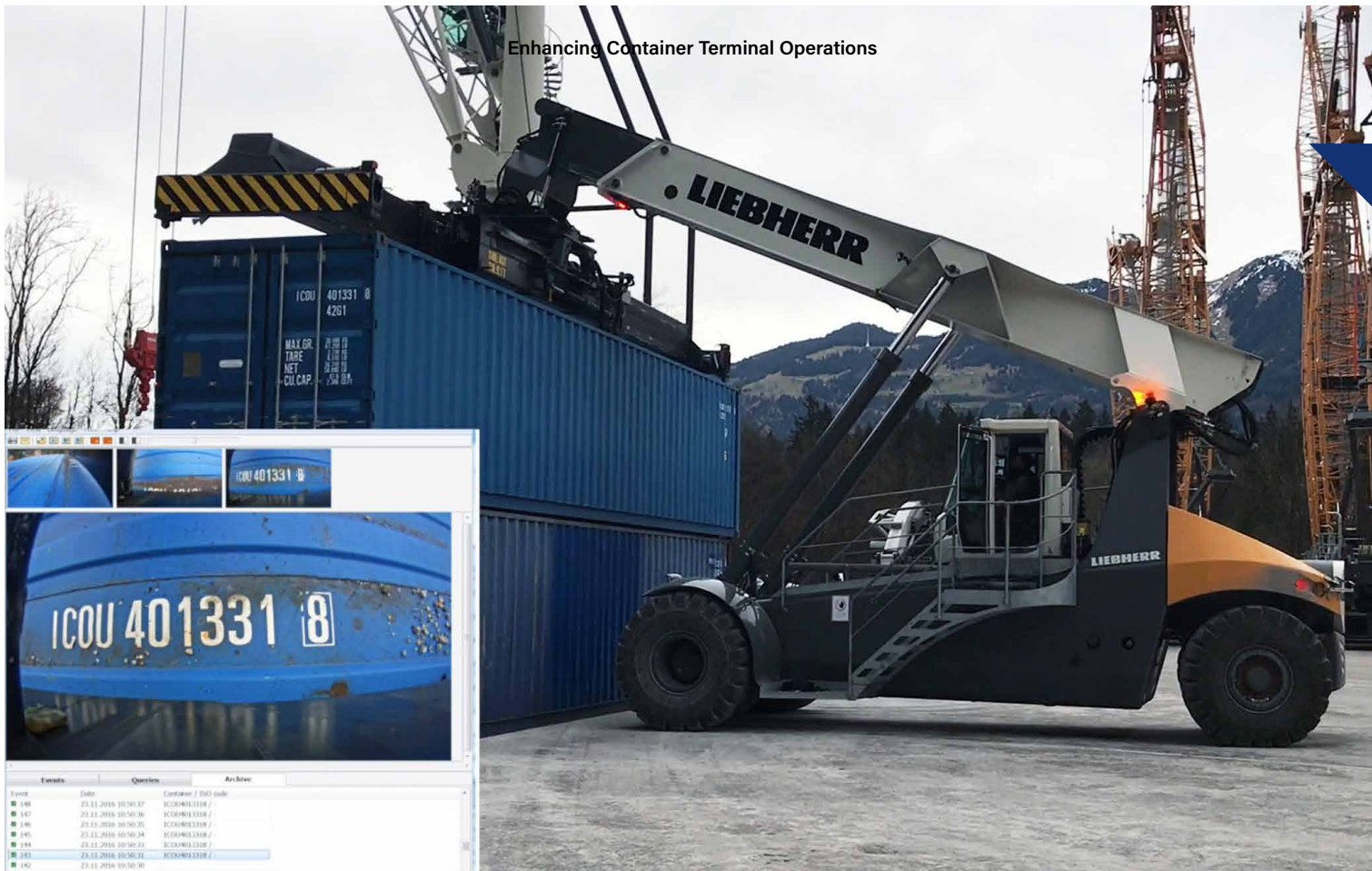
TopView also improves operational safety by reducing the need for hatch clerks to be in harm's way. Using OCR, TopView identifies the box as soon as the twistlocks engage. The OCR results are immediately verified against the TOS. In case of a discrepancy, the clerks may simply look at event images from a remote location rather than having to physically be near the box itself. This way of working improves health and safety and improves the quality of life of terminal staff.

TopView also utilises vision technology to prevent lift accidents. The twin-20 recognition feature prevents hazards associated with picking two 20-foot containers when only one 40-foot container is scheduled and the spreader is in single lift setting. The container formation is determined from the spreader camera images and compared with the current spreader setting. The crane operator receives an alert if the selected lift type does not match the images, thus preventing accidents where the middle locks are not engaged.

NEW ERA OF TERMINAL AUTOMATION

The benefits of vision technology systems in container handling are too big for operators to ignore. From an operational standpoint, utilising TopView will increase throughput capacity and reduce

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operating expenses through accelerated handling processes. With TopView, terminals also experience significant operational improvements in other areas, such as health, safety and security.

TopView produces data that is instantly utilised in process automation. By turning the spreader into a data collection point, operators receive automatically digitised data every time a container is moved. The recognised container IDs are confirmed through communication with the TOS, which eliminates time-consuming wrong moves. TopView also verifies stack accuracy by automatically identifying every box on every move, including shuffling

operations, and referencing the results against the position detection system (PDS) and TOS in real time.

Data exchange with third-party systems and the workstation user interfaces are highly customisable to fit the unique needs and expectations of each customer. Light but durable infrastructure and easy maintenance make TopView a cost-efficient solution.

TopView presents a massive opportunity for terminal operators. In this new era of terminal automation, modern operators are taking advantage of vision technology to make prudent business decisions, offer better customer service, and reach new levels of productivity.

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Visy TopView in use on a Reach Stacker

ABOUT THE AUTHOR

John Lund is the Global Sales and Marketing Director of Visy. Lund has more than 15 years of experience in helping marine and intermodal terminals achieve their operational objectives through implementation of technology. A Boston native, Lund has lived in various parts of Europe and the US, and now resides in Tampere, Finland.

ABOUT THE ORGANISATION

Visy specialises in saving customers time and money through automation solutions that feature optical character recognition (OCR) and other vision technologies. Visy has over 25 years of experience in deploying mission critical systems and has established itself as a global leader in gate automation and access and area management solutions for the logistics industry.