VISY

EVOLVING AUTOMATION ECOSYSTEMS

Enhancing and streamlining the safe flow of cargo

Expand | your vision


Expand
your
vision

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EVOLVING AUTOMATION ECOSYSTEMS

Visy is a Finnish information technology company pioneering in optical character recognition (OCR) and other vision technologies for terminal automation. Our expertise is based on over 25 years of experience in research and development of industry-leading AI and deep learning, and delivering our smart gate and automation system environments for container ports and industrial sites all over the world.

Operating in **25+** countries

500+ sites automated

5 000 000+ access control decisions each day

Millions of OCR images in library

Innovating since **1994**

How process automation will improve your business?

Process automation enhances and streamlines your operations. **The operational benefits of OCR solutions and gate automation are clear:**

- Reduced operating expenses
- Optimised safety and security
- Increased throughput capacity

These three overarching benefits are inevitably connected to essential KPIs such as truck turnaround times, moves per hour, cost per lift, and preventing lost time for accidents. Automatic identification of vehicles and containers and instantly forwarding the data to the terminal operating system significantly enhances operational efficiency.

Decrease Truck Turnaround Time by up to

60%

Automating gate operations saves costs up to

80%

Expand your vision with our world-leading AI and OCR technologies

Visy's mission is to provide the most advanced and reliable system environments for terminal automation. A central component of Visy systems is our in-house AI & OCR software for automated cargo and vehicle data collection. The recognition software relies on our Deep Neural Network (DNN) engine which executes different identification tasks in various environments, from simple license plate recognition at the gate area to more demanding tasks in container handling operations.

Intelligent traffic management applications and cargo data capturing

In-house recognition software carries out various identification tasks.

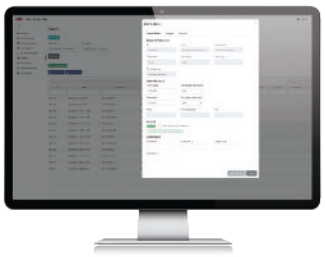
Robust high-quality equipment ensures the system's long life-cycle and high recognition accuracy.

User-friendly applications provide a good customer experience.

All Visy's automation ecosystems consist of **high quality equipment, recognition software, and user interface applications.** Visy systems produce high-quality images, ensure smooth gate transactions, maintain market-leading recognition accuracy, and make the captured data available in the right system at the right time (Visy Access Gate desktop application, interfacing to customers' own systems: TOS, ERP, etc.).

Automated access control and container identification in every turn ensures a smooth traffic flow and increases profits through enhanced operational efficiency.

Simple system infrastructure brings reliability



Pre-Booking systems
Visy Access Net for hauling companies for creating site visit requests. After the booking is completed, vehicle and cargo information are sent to the TOS and Visy Access Gate database, for example to validate entry to the premises.

High-quality equipment & recognition software
Visy's smart gate infrastructure recognizes arriving vehicles and cargo for access control, and shares the data with third-party systems.

Database server
Database servers (Oracle) store traffic events, images, and booking information. Thanks to the efficiency and speed of Oracle, the flow of information is rapid.

User-friendly interfaces and extensive data exchange with third-party systems
Workstation, web browser, and mobile applications for managing captured data and traffic events. Seamless data exchange enables instant communication with customers' own systems.

The process is applicable to all Visy's recognition solutions.

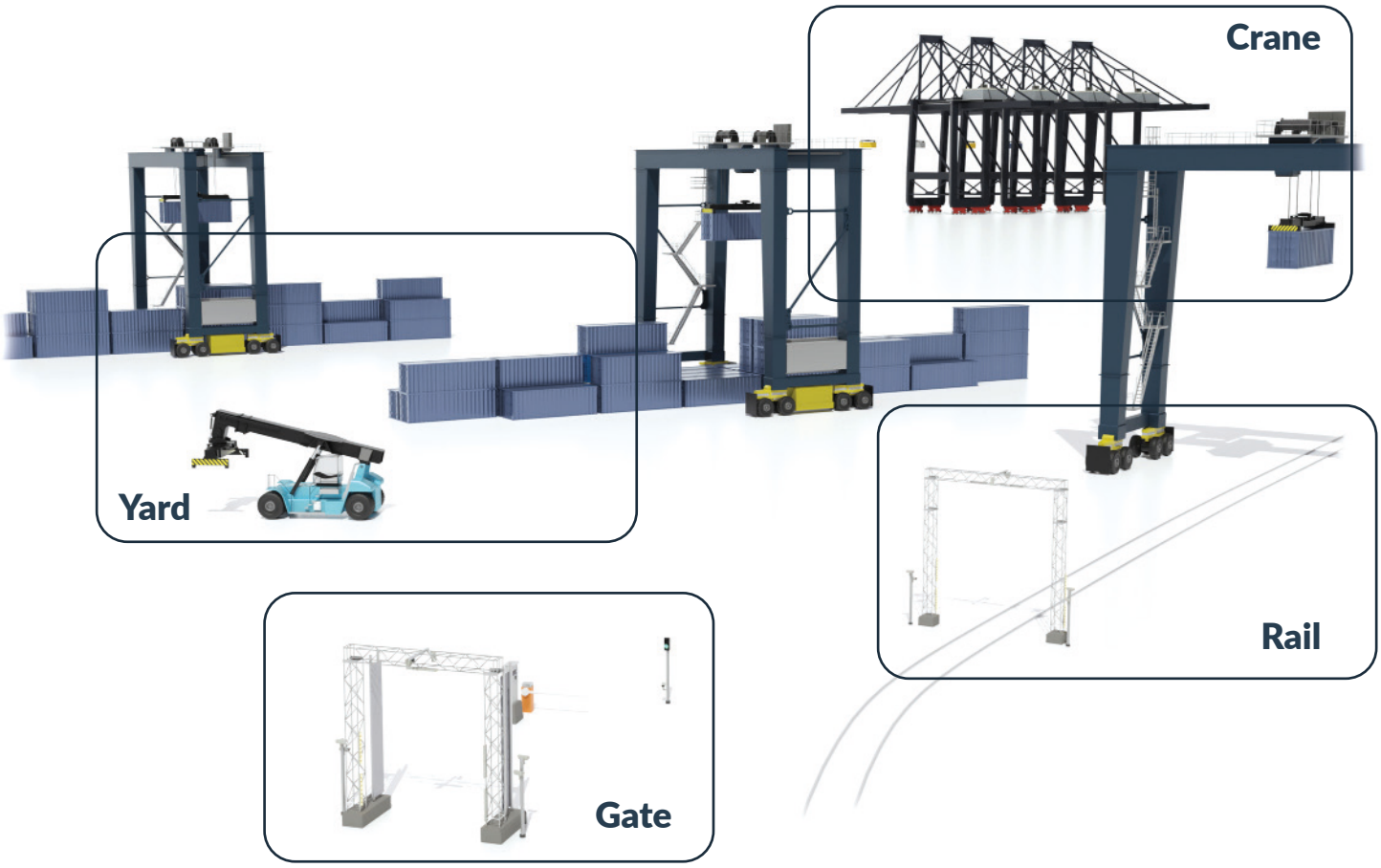
Building the ecosystem according to your operations

The design of the recognition environment is based on each customer's unique requirements and business objectives, as well as the nature of the area's traffic. An important part of the design phase is mapping the existing system network, necessary integrations, and possible interfacing to third-party-systems.

Reliability and longevity of Visy solutions is our ambition in every system delivery. All Visy systems are highly scalable, which provides opportunities to expand the system alongside the growth of operations and according to growing needs. Visy's skilled project management and professional Support & Maintenance services quarantee long-lasting solutions and keep the systems running without exceptions.

SOLUTIONS FOR PORTS AND TERMINALS

Visy is the future-proof partner for all gate automation, access control, and logistics needs. Our product selection for Ports and Terminals is wide to match the diversity of container operations. The system selection covers every part of each terminal where automatic identification, imaging, and tracking of cargo, vehicles and people brings new opportunities to streamline operations.



Smart Gate	Container Handling	Rail Operations
Visy Access Gate GOS	Visy Crane OCR	Visy Train Gate
Visy Truck OCR Portal	Visy RMG OCR	Visy Rail OCR Portal
Vehicle Booking System	Visy RTG OCR	
Visy Service Kiosks & Apps	Visy TopView – Spreader OCR	
Visy Automatic Damage Detection System (ADDS)		
Visy AREA		

VISY ACCESS GATE GOS

Flexible and modular access control ecosystem

Visy Access Gate is a highly versatile Gate Operating System (GOS) designed to streamline and automate terminals' gate processes. The flexible and modular access control ecosystem manages vehicle and cargo traffic with intelligent system features that optimize operations and allow you to effectively handle vast volumes of gate transactions.

Smart gate environment

Visy Access Gate GOS covers all access and area control needs with a wide selection of visual recognition solutions (OCR, ADDS), identification technologies (RFID, QR, PIN, GSM), and management tools. Visy delivers all required gate equipment (gate kiosks, barriers, traffic lights), so that the customers get the complete smart gate environment from one supplier.

Visy Access Gate is a user-friendly application for rewiewing traffic events, exception handling, and managing the area's cargo flow

Practical tools for managing traffic events

Visy Access Gate GOS complements terminals' existing intelligent networks with unbeatable integration and interfacing possibilities. The solution's desktop and web-based user applications provide tools and reporting functionalities for managing access permits, reviewing traffic events, and identifying operational bottlenecks.

VISY TRUCK OCR PORTAL

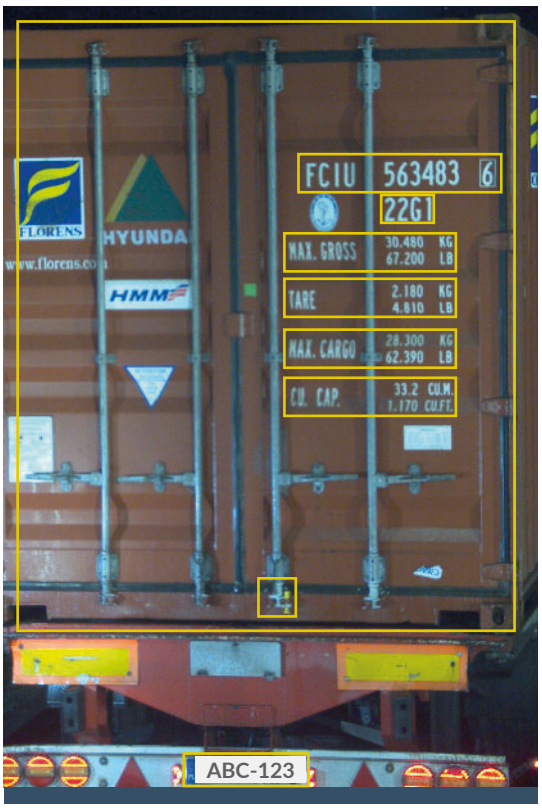
Advanced container OCR and cargo data collection solution

Visy Truck OCR portal is the key part of a smart gate environment. The portal automatically captures high-quality images of all vehicles entering of leaving the facility, and runs all the required visual recognition tasks on them. The practical yet intelligent solution exchanges the captured identification data without delay with the TOS, thus ensuring a smooth flow of traffic at the terminal gate area.

High-quality line scan imaging

The portal solution combines Visy's industry-leading computer vision and container recognition software with line scan and area scan camera technologies. Vehicle and container identifiers are extracted from the images in any environmental condition. Visy Truck OCR portal is a unique solution with exceptional real-life accuracy of 98-99.5% correct recognitions even with driving speeds of up to 50 km/h.

High-quality images are also used for reviewing the condition of containers.



Recognition of with accuracy up to

Container ID	99%
ISO Code	98%
Weight gross	99%
Weight tare	98%
Seal presence	99%
Door direction	98%
License plate	99%
Rear License plate	99%
Dangerous goods labels	99%
Trailer ILU codes	95%

Visy Truck OCR Portal add-on feature: Visy Measurement Portal

Visy Measurement Portal (VMP) measures and weighs vehicles and cargo while they are entering or leaving the terminal area. VMP provides terminal operators accurate measurement and volume information of arriving traffic and delivers opportunities for planning loading and unloading processes.

VMP is inserted to the Visy OCR Portal environment with a separate portal equipped with laser scanners and WIM scales to gather exact length measurements and to weigh arriving vehicle and cargo. The captured data is then brought to Visy Access Gate user interfaces.

Virtual Trigger is a system software feature for Visy OCR that replaces traditional triggering hardware

VIRTUAL TRIGGER

Visy's philosophy has always been to require more from the system software, and when possible, find ways to replace hardware functions with vision technology features made possible by our Deep Neural Network (DNN). The next logical step in the evolution of Visy technology for gate automation is a solution that triggers the recognition of OCR events without additional hardware.

Minimizing infrastructure

Virtual Trigger is a system software feature for Visy OCR that replaces traditional triggering hardware, such as ground loops or laser scanners, in the license plate or container ID recognition process. During the commissioning phase of the project, virtual triggering zones are created and optimized to indicate the right time to capture an image for the camera system. When a vehicle enters the camera's field of vision and the motion-based triggering zone meets specific criteria, the system acquires the necessary data for recognition and storage.

Truck OCR Portal features

- In-house recognition software for license plates, container IDs, trailer ILU codes, ISO codes, dangerous goods labels (IMDG), seal presence, door orientation, etc.
- Industry-leading accuracy of 98%-100%
- Non-stop traffic flow, supports speeds of up to 50 km/h
- Designed in Finland – works in harsh weather, installations from -40°C to +50°C
- Robust portal frame with line scan and area cameras, laser scanners, illuminators, electrical cabinet, OCR PC, and database server
- Extensive data exchange and interfacing with third-party systems (TOS, ERP)
- Integration to customer's other systems
- Automatic detection and alerts for damaged containers with Visy ADDS
- Cargo measurement features: weighing and length measurement with laser scanners and WIM scales

VISY ADDS

World's first vision-based solution for automated damage alerts

Visy Automatic Damage Detection System (ADDS) is the first commercially available solution for automatic container damage inspection. The solution uses modern AI with vision technology to provide a real-time tool for detecting damaged containers. Non-stop operation, online monitoring, and automated alerts allow damage inspection without interrupting traffic.

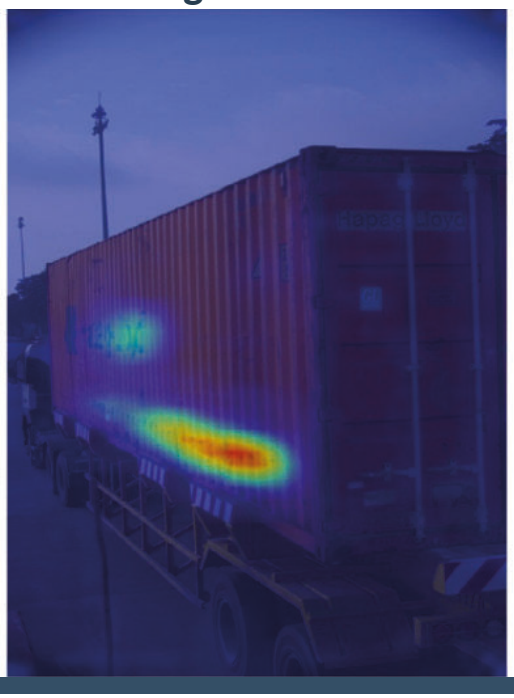
Insert Visy ADDS feature into your OCR Portals

Visy ADDS is an add-on feature for OCR portals. The damage detection is done by a DNN engine that accurately recognizes damage (rust, dents, bulges, etc.) from images captured by the OCR portal. The system is optimized with each customer's requirements to function in a way that enhances business operations. ADDS prevents more damage from occurring when the containers are stacked. Damaged containers are directed to the repair station before continuing their journey.

The solution uses modern AI with vision technology to provide a real-time tool for detecting damaged containers

Input

Damage score 91.9%



Detections

VISY RAIL OCR PORTAL

Efficient OCR and condition imaging for rail cargo

The Visy Rail OCR Portal environment automatically images and recognizes trains, wagons, and cargo in rail and intermodal environments. With Visy's recognition software and DNN engine, the portal solution identifies container IDs, wagon numbers, ISO codes, dangerous goods labels, and other targets of interest.

Robust portal environment

Visy Rail OCR Portal utilizes Visy's industry-leading OCR and AI software with line scan and area cameras, laser scanners, and efficient illuminators. The solution captures high–quality images in any environmental condition, even with speeds of up to 70 km/h. Recognition data is extracted from the images by Visy OCR software with a high rate of accuracy. The captured images also provide access to retrospective damage inspection and keeping a record of the condition of containers.

Recognition targets and accuracy:

Container ID	99%
ISO code	98%
Dangerous goods labels	95%
Wagon ID	99%
Wagon length	98%
Wagon weight	95%
Max volume	95%
Capacity	95%

In addition to the standard recognition tasks, the system can be customized to recognize additional targets according to customer needs

VISY TRAIN GATE

Versatile system to streamline rail operations

Visy Train Gate is a user application for managing the flow of the cargo and train traffic. Precise recognition data and high-quality images are available in the user interface in real time for reviewing and editing with versatile management tools. Seamless integration and interfacing to other systems ensure that customers are able to use their own systems for data and traffic management without any drawbacks.

Visy Train Gate user interface for managing the captured data

Features & Benefits

- Fully automatic solution, 24/7 nonstop operation
- Real-time tracking of rail cars, wagons, containers, and double-stacked trains over multiple rail tracks
- Extensive data exchange and interfacing with third-party systems (TOS, ERP)
- Streamlines rail operations
- Reduces manual inspection work
- Clears liabilities for damage containers

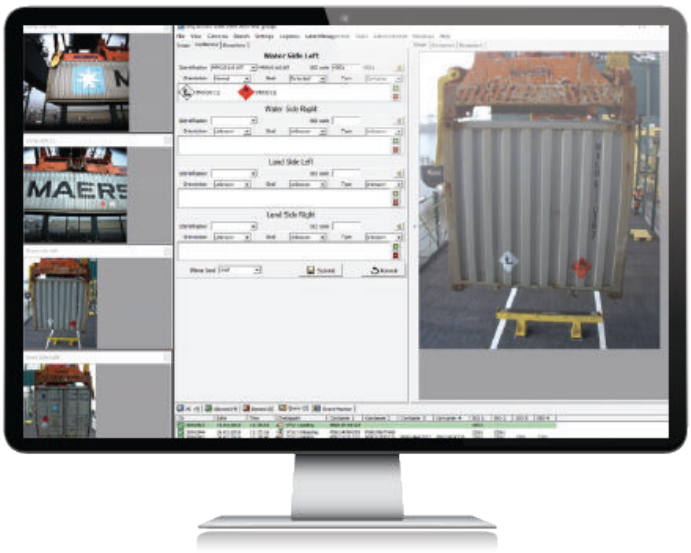
VISY CRANE OCR

Reliable OCR system for container imaging and data capturing

Visy Crane OCR for ship-to-shore (STS) cranes automatically images all sides of containers and recognizes container IDs, ISO codes, dangerous goods labels (IMDG, ADR), and other targets of interest while containers are being lifted by cranes. The Visy Crane OCR system setup and equipment are designed to operate in harsh environments. The solution utilizes PTZ (pan-tilt-zoom) cameras mounted on the portal beams and crane legs without moving parts to enhance system reliability and durability. The system can be scaled to also include recognition of terminal tractor numbers, so that the entire container handling process will be effectively covered and streamlined.

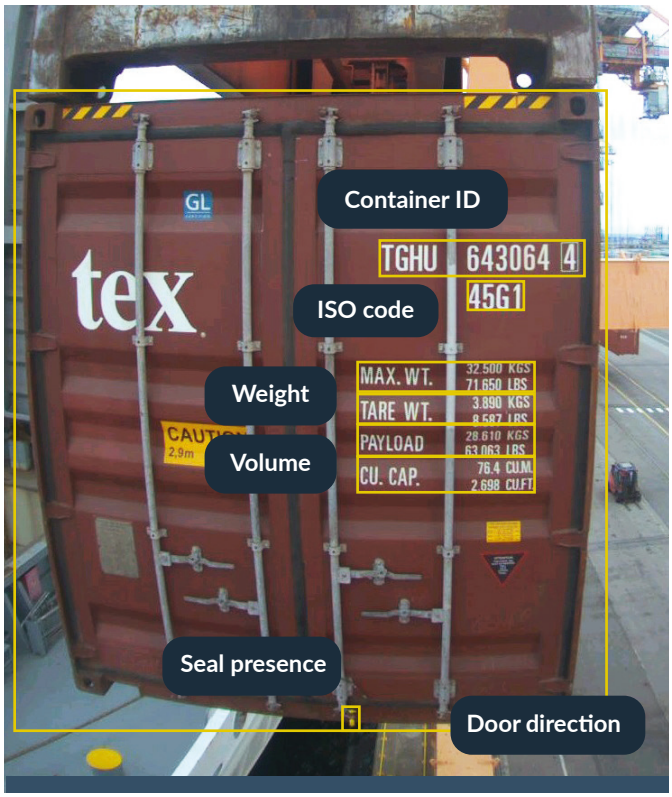
Features according to your operations

All Visy Crane OCR applications are designed according to the operational needs of each customer. The system setup is chosen case by case to support all container handling cases, lifting types (twin, single, tandem, quad, tank), and spreader flying paths, as well as backreach and platform operations.



Recognition targets and accuracy:

Container ID	99%
ISO code	98%
Weight	99%
Volume	98%
Dangerous goods labels	99%
Seal presence	98%
Door direction	100%
Container condition (ADDS)	95%
Terminal tractor number	99%
Lift type	



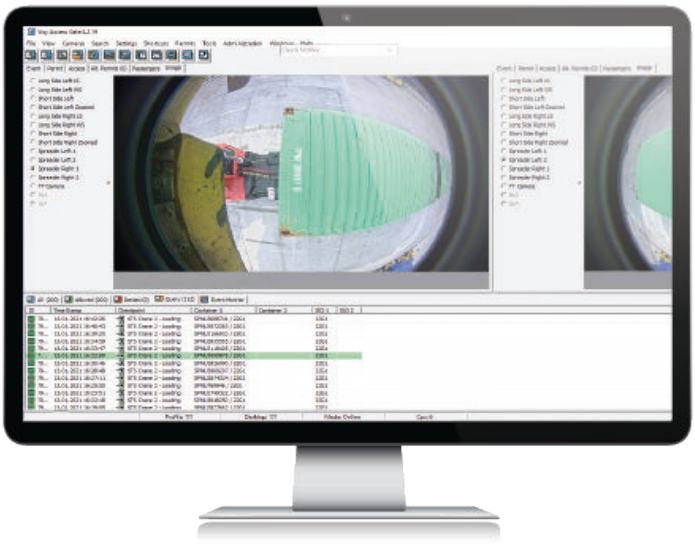
VISY TOPVIEW

Enhance visibility in container handling with spreader OCR

Visy TopView spreader camera system automatically identifies container IDs from the top of a container, transforming any spreader into a smart device with Visy's in-house recognition software. Visy TopView accelerates container handling processes and prevents time-consuming false lifts, which instantly helps to increase any terminal's operating capacity and stack accuracy. With Visy TopView, no container is being stacked to a wrong location, regardless of whether the operation commences over vessel, truck, train, or yard.

Smart implementation

Visy TopView is a compact system in which all equipment is installed directly on the spreaders, including cameras, illuminators, cabling, and device cabinets. Intelligent OCR software selects the best results to achieve a recognition rate of up to 98%. Real-time communication with the TOS verifies that each movement of cargo goes as planned. Durability of the system makes it a reliable partner for terminal operators in container handling processes.



TopView can be installed to any type of container handling equipment, including single, tandem, twin, and quad spreaders

VISY RTG OCR

Terminal automation enhances safety

Automating RTG operations with vision technology increases safety and control in container handling. The Visy RTG OCR system prevents accidents where twistlocks have been mistakenly left attached to the container after unloading it from a vessel. The system is also equipped with Visy TopView, which automatically reads the container ID when the spreader picks up the container. Interfacing with the TOS allows tracking of containers in real time.

Add more recognition features for more comprehensive results

For more comprehensive results and wider utilization of automation, the RTG OCR system can be equipped with license plate recognition cameras for matching trucks with the containers. By adding PTZ cameras in the gantry structure, long sides of containers can also be imaged to obtain higher recognition accuracy and damage condition recording.

Features

- Container ID recognition with Visy TopView spreader OCR
- Real-time detection of twistlocks
- PTZ cameras for imaging container long sides
- Terminal tractor number detection
- Extensive data exchange and interfacing with third-party systems (TOS, CCS)
- Robust equipment environment
- Installations to both new crane deliveries and retrofits on site

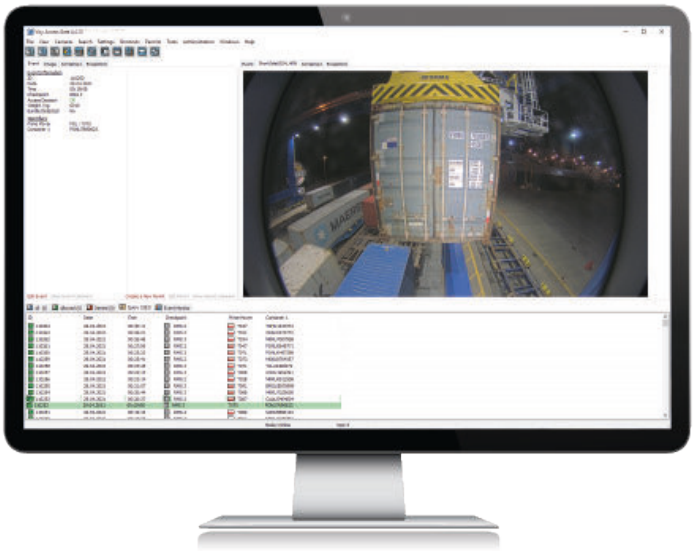
VISY RMG OCR

Increased container handling efficiency

Visy RMG OCR images short sides of containers while they are being handled by the RMG spreader. The solution automatically acquires container IDs, ISO codes, and seal presence when containers are moved at rail interchange/stack areas and shares the captured information with the TOS.

System configurations

Visy RMG OCR has different configurations depending on how the system will be used:

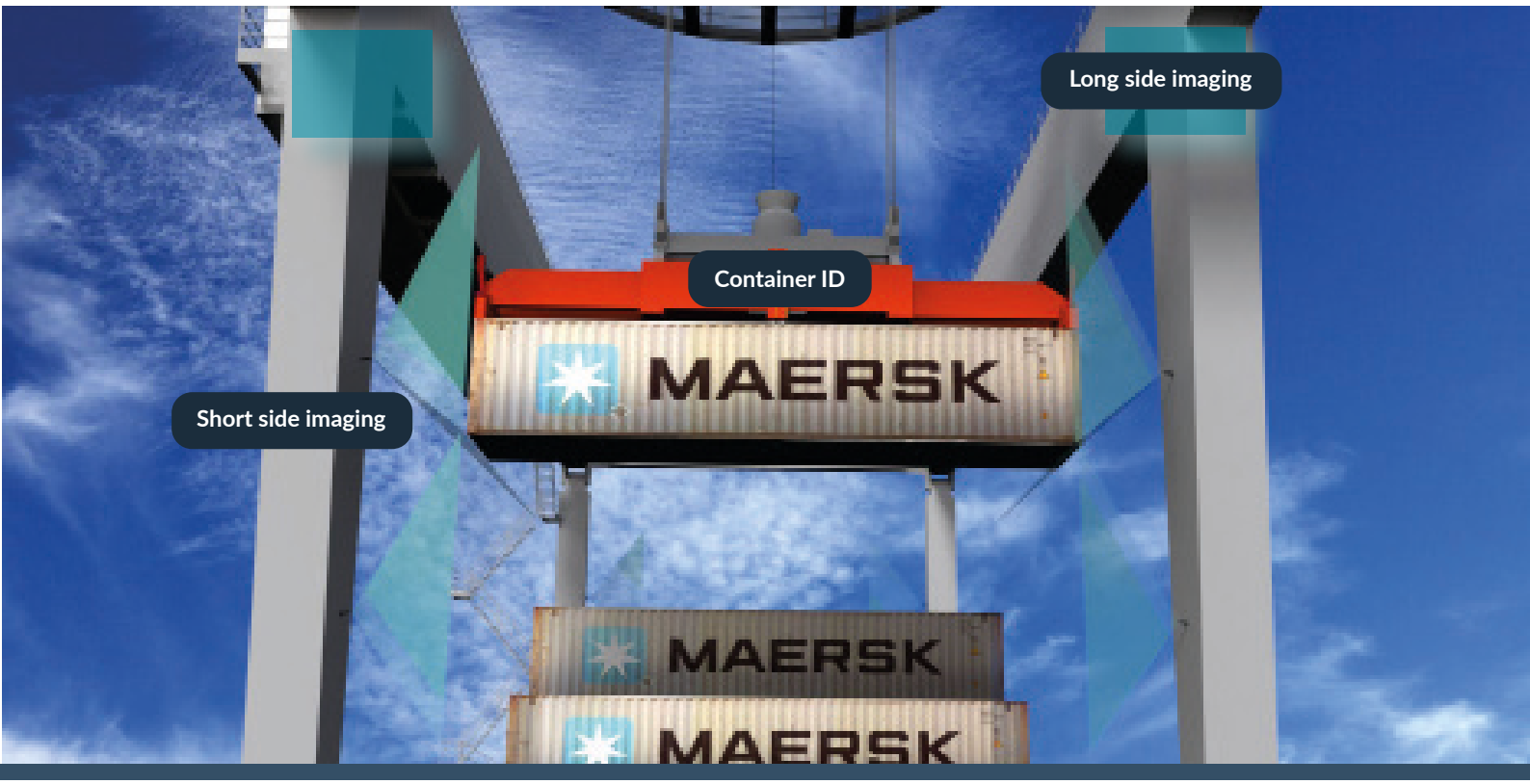


Recognition of container ID, other identifiers, and damage

Visy TopView is installed on the spreader to capture the container ID. Additional cameras (PTZ) are mounted on the legs of the RMG to capture images of the short and long sides of the container for other identification data and damage detection.

Container ID recognition only

Visy TopView spreader camera system is installed on the spreader to capture only the container ID and image. Each time the spreader moves a container, TopView captures images and shares the container ID data with the TOS.



"QQCTN's intended single crane handling efficiency was 40 boxes per hour. With the help of Visy Crane OCR, in April 2020, the terminal created a new world record by handling 44.6 containers with a single crane."

Victor Zhang, Eagle Vision

"After implementing the Visy Access Gate GOS, Port of Cork has experienced improved terminal performance, reduced truck waiting times, and above all, more satisfied customers. "

Port of Cork, Ireland

"Visy's support service is one of a kind: conscientious, accurate, and above all, the reaction is extremely rapid regardless of the time and place."

BCT Gdynia, Poland

OPERATING WITH VISY

See more at visy.fi

GLOBALLY LOCAL

Visy's global high-quality partner network minimizes reaction time and our experienced project management guarantees top-class solutions, delivery, and support worldwide.

Visy is dedicated to evolve solutions and technologies further with continuous R&D work

Our history of innovation

We at Visy take pride in solving our customers' challenges and enabling them to save time and money by automating and streamlining operations. Our mission has been clear from the company's inception: to develop and provide the highest quality and most flexible software on the market and to integrate the latest equipment to perfect the solution.

Solution development has been an integral part of Visy since the beginning. We are constantly seeking to improve our product portfolio to match customer needs better; both by adding new features to existing products and by launching new innovative solutions to the market. Visy's software is industry-leading and future-proof: we are trailblazers in delivering disruptive technologies.

One of our core values is to be customer-oriented. This means that while we design new features and products, we put the customer's needs first. All our development pipelines are agile, designed to easily produce what is needed in a particular use case.

1997: First Visy OCR deliveries

2011: Deep learning research starts

2012 - 2013: First DNN tools emerge

2014: First Visy DNN installations

Deep learning as the source of progress

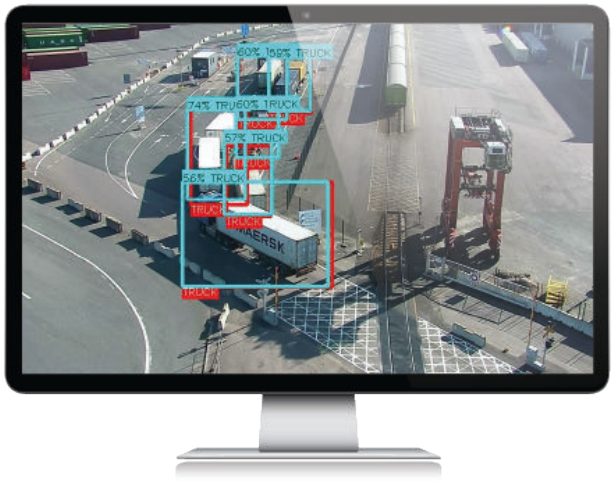
Visy has used Deep Neural Networks (DNN) with computer vision for over 25 years. Early models were successfully used in optical character recognition (OCR), while the use of modern DNNs has expanded to also include a large variety of other tasks, ranging from recognizing license plates, wagon numbers, and car brands to detecting whether a spreader is lifting one 40-foot container or two 20-foot ones. In a big terminal, there can be dozens of DNN models running.

On a mission to expand vision

Our product roadmap focuses on artificial intelligence: AI and vision technology are at the core of Visy's product portfolio. In the future, we will move towards more lightweight platforms and transfering the intelligence away from physical infrastructure and into software, which makes our solutions more flexible and cost-efficient, as well as easier to deploy.

The trend towards low-infrastructure and software-dominated solutions is already visible in the new products launched in 2021:

- Visy ADDS: World's first automatic damage detection system
- Visy AREA: Vehicle track-and-trace with overview cameras
- Visy SensEye: Traffic counting and analysis
- Visy EDGE: Container code recognition with a mobile app
- Visy VIRTUAL TRIGGER: Camera-based triggering for low-infra installations



Visy AREA uses AI and vision technologies to identify and monitor vehicles and containers during their entire journey throughout an area

2015: Visy's in-house DNN recognition engine

2016: First commercial DNN platforms

2017-2019: Dozens of new Visy DNN applications

2020: All new Visy DNN

Expand your vision

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