Camco Times

Issue 04 – June 2016

CAMCO TECHNOLOGIES

DRONES IMPACTING TERMINAL AUTOMATION

INTEGRATING DRONE TECHNOLOGY IN CAMCO PRODUCTS

TOC HAMBURG

INTERVIEWS WITH LHG, HHLA CTA AND HHLA CTB

WATCHPOINT APP

CENTRALIZED MONITORING OF CAMCO EQUIPMENT AND APPLICATIONS

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Holger Mewes assists truck drivers with the new gate process. Introduction of Camco systems at HHLA CTA, 2007.

COLOPHON

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In this issue

ABOUT Camco Technologies

Camco Technologies is the leading technology company in innovative terminal automation solutions and services. Since 1999, our systems empower marine and railway terminal operators to increase their performance and safety while reducing operating costs.

Already 150+ terminal operators worldwide successfully optimized their gate, crane, rail and yard processes using our highly accurate OCR technology, robust kiosk systems and advanced Gate Operating System.

Camco's core business exists of products that automate the handover process of containers by using visual-assisted and position detection technologies. In-house developed OCR-based systems accurately register containers entering or leaving the terminal by any means of transport, enabling the TOS to make the right decisions. The powerful combination of OCR technology with Position Detection Systems provides accurate information on where a specific container was lifted or dropped.

Camco's hardware and software systems can be customized and are designed for seamless integration with other systems, such as the TOS, vehicle booking and planning systems.
Read more at: www.camco.be

Terminal automation in Germany: past & future

Anton Bernaerd, Business Development Director
Germany with its many major container and RoRo terminals, has since the foundation of Camco played a crucial role in the further evolution of Camco as a company, technology provider and Maintenance & Support organization. Not so long after the installation of our first OCR camera portals in Belgium, Finland and the US, Camco was selected to introduce a comprehensive OCR camera portal system at the Eurogate terminal in Bremerhaven in 2004. This was a major milestone in the history of Camco and the start of a very successful German journey.

Eurogate Bremerhaven was quickly followed by other vision-based automation projects, such as at the different HHLA terminals in Hamburg, Lübecker Hafengesellschaft, Seehafen Kiel, Port of Rostock, DP World Germersheim, to name a few.

Pushing boundaries

Thanks to the clear vision on terminal automation and the sometimes tough and always challenging requirements specified by those terminals, Camco was able to improve its project management skills, to fine-tune its existing products, and to develop new systems.

Systems and solutions such as Camco's Rail OCR portal, landside transfer point (LSTP) kiosk systems, ultrasonic sensor systems, barcode reader kiosk modules, and laser scanner systems, were for the first time introduced in a German terminal.

In particular the complete gate automation projects within the HHLA group have taught us a lot on terminal and gate processes, as well as on interfacing with TOS and other host systems.

Was it always a smooth ride? No, at particular times the road was rough and rocky. But thanks to the continuous support, confidence and perseverance of our customers, we always reached the objectives according to the specs and expectations, and we continue to do so! And it is clear that we did not reach the finish yet — as the interviews with HHLA and LHG reveal on the next pages. Terminals are constantly looking to introduce more technologies, to improve and simplify current processes, and to make them even more efficient and reliable.

Dedicated Account Manager

Camco remains their loyal and devoted partner! Proof is the dedicated Business Developer and Account Manager for all German customers and projects: Brecht Thijs. Do not hesitate to contact him at brecht.thijs@camco.be. He will be happy and honored to answer your questions and inquiries.

TOC Hamburg interviews

We hope you will enjoy the articles on the HHLA terminals and LHG hereafter and I thank everybody who participated for their time and input.

Due to limited space and time we were unfortunately not able to add all interviews and case studies in this issue. We promise we will come back in next issues of the Camco Times with more feedback on our German partners.

We at Camco Technologies thank all our German customers for their loyalty and excellent collaboration and partnership. We look forward to continue this unique relationship.

Anton Bernaerd,
Business Development Director

Brecht Thijs,
Business Developer & Account Manager (Germany)

Port of Kiel, Ostuferhafen

HHLA Hamburg

Rostock Port

ROSTOCK PORT

Important ferry and RoRo terminal, located in the Baltic Sea region.

- Automation of in- and outbound traffic with camera portals and access and exit control kiosks.
- Condition recording of all in- and outbound unaccompanied trailers, length measurement and traffic management.
- At exit gate, license plate is checked and matched with previously gathered data to verify that tractor leaves with the correct trailer.

LHG SKANDINAVIENKAI

Europe's largest ferry port located on the Baltic Sea, specialized in handling wheeled cargo.

- Automation of in- and outbound traffic with camera portals and transaction kiosks.
- Condition recording of all in- and outbound unaccompanied trailers, including length measurement.

LHG SEELANDKAI

LHG's container handling terminal, designed for handling ConRo ferries.

- Automation of in- and outbound traffic with camera portals.
- Condition recording of all in- and outbound unaccompanied trailers.

PORT OF KIEL

Multifaceted port at the Baltic Sea, providing RoRo, LoLo and intermodal facilities, and ferry traffic. Camco installations on Ostuferhafen and Schwedenkai.

- Automation of in and out gates with access and exit kiosks.
- Condition recording of all in- and outbound trailers.

SAMSKIP VAN DIEREN DUISBURG

Multimodal terminal offering rail services between Scandinavia and Europe.

- Automation of in- and outbound traffic with access and exit kiosks.
- Condition recording.

HHLA CONTAINER TERMINAL ALTENWERDER

Fully automated container terminal, situated on Hamburg's Elbe river.

- Dual train gate solution for automatic registration of rail containers.
- Automation of inbound traffic with camera portals, self-service kiosks and transaction kiosks.

DP WORLD GERMERSHEIM

Multimodal terminal on the upper Rhine.

- Automation of outbound gate.
- Automated exit control.

EUROGATE CONTAINER TERMINAL WILHELMSHAVEN

Deep-water container terminal, located directly on the North Sea. Major transshipment hub for feeder services to Scandinavia, the Baltic and Russia, as well as for the Rhine/Ruhr region.

- Automation of in- and outbound traffic with camera portals and transaction kiosks.
- Yard access control lanes.

EUROGATE CONTAINER TERMINAL BREMERHAVEN

Located directly at the North Sea, CTB is an important hub for container transport into Europe and the whole world.

- Automation of inbound traffic with a dual OCR portal and transaction kiosks.

CONTARGO EMMELSUM

New intermodal terminal in the port of Emmelsum.

- Rail OCR solution.
- Automated gate system with 2 OCR portals (in and out) with 5 transaction kiosks. Currently in engineering phase.

HHLA CONTAINER TERMINAL BURCHARDKAI

Largest facility for container handling in the port of Hamburg.

- Automation of inbound traffic with camera portals, self-service kiosks and transaction kiosks.
- LandSide Transfer Points in yard area to automate container transfer.

HHLA CONTAINER TERMINAL TOLLERORT

Extremely compact and flexible container terminal in the port of Hamburg.

- 10+ self-service kiosks.
- 30+ Grid kiosks to automate the straddle carrier-based interchange processes.
- Automation of inbound traffic with camera portals.

HHLA Container Terminal Altenwerder, Hamburg

INTERVIEW WITH GERLINDE JOHN, HOLGER MEWES AND JAN KOLDITZ

HHLA Container Terminal Altenwerder (CTA) is one of Europe's first fully automated terminals and one of the flagship terminals of HHLA. CTA is located in Hamburg on the river Elbe. CTA uses Camco OCR solutions at the truck gate (in), Camco kiosks for the self-service handling at the gates and recently implemented a Camco OCR system to automatically register incoming trains and the containers they carry.

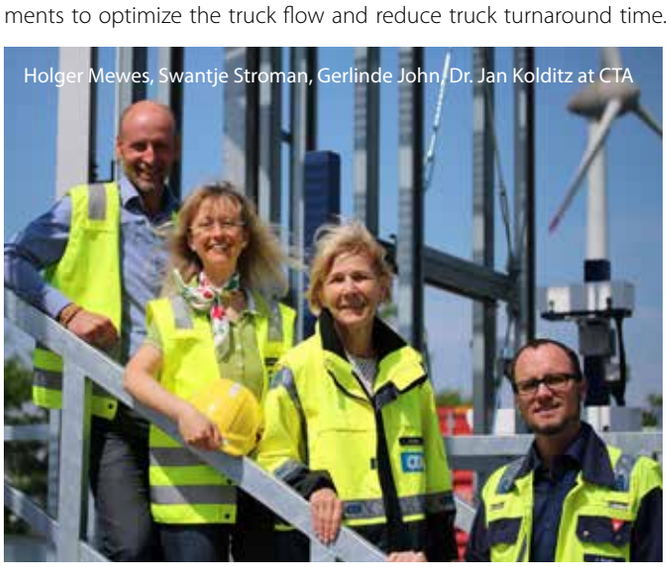
During the 2005 TOC in Antwerp, Mrs. Gerlinde John (CTA) discovered the Camco solution. Gerlinde is very experienced in container terminal operations and technology to support and manage the terminal processes. She is head of the development department, which advises and manages projects to increase customer service, improve resource usage and optimize the entire terminal on all levels.

When first learning about Camco's solutions in 2005, Gerlinde was impressed by the high quality of the pictures taken by the truck gate systems. These quality pictures formed the basis to explore in detail if the Camco solutions would be beneficial for CTA.

Gate automation with portals & kiosks

After evaluation and analysis, Camco was selected for having the best-fit solution for CTA and the cooperation started. In 2006 the truck OCR solutions were installed. Mr. Holger Mewes joined the development department as project manager, responsible for all projects related to truck handling at CTA. His extensive knowledge of traffic flows and logistics were a great asset when Holger started optimizing and further developing the truck related processes.

The truck flow starts when the truckers arrive at the terminal and use the Camco supplied self-service desks to register their visit. After witnessing the use of self-service kiosks at DP World Antwerp, CTA was instantly convinced they would contribute to the optimization of the gate processes. In parallel, CTA now uses truck pre-announcements to optimize the truck flow and reduce truck turnaround time.



Holger Mewes, Swantje Stroman, Gerlinde John, Dr. Jan Kolditz at CTA

A pre-announced trucker does not have to leave his or her vehicle at the gate and is identified by the Hamburg trucker ID card, the ***Truckerkarte***. In addition, a fast lane is implemented for empty chassis.

Holger and his team have developed a project catalog for the gate processes on the other HHLA terminals. The experience gained at CTA resulted in a blueprint for other HHLA terminals.

Increase in rail traffic calls for improved safety and efficiency

The changes in the modal split urged CTA to make better use of the available area and increase the capacity on the same available surface. As volumes transported by rail continued to increase, CTA prepared for the future by using less interspace between tracks, resulting in a configuration of 9 tracks, each 730 m in length. Compared to the earlier 7 tracks, the handling capacity increases by almost 30%. The decision to expand the tracks was speeded up, since structural maintenance was imminent after 15 years of service.

Dr. Jan Kolditz manages the implementation of the Camco rail gate and the adaptation to CTA requirements. He is deputy manager of the development department and coordinates the continuous improvements at CTA. Jan's experience in implementing an OCR prototype at a ship to shore crane and his knowledge of technology integration were a great asset when he joined the CTA rail gate project team.

FACT SHEET CTA

Operational data

Area:	1.0 km²
Length of quay wall:	1,400 m
Berths:	4
Maximum draught:	16.7 m

Handling equipment

Container gantry cranes:	15
Automated guided vehicle:	76 + 10 Battery-AGV
Automated yard blocks:	26
Gate:	8 lanes
Transfer point for trucks:	104 lanes

Train

Rail-mounted gantry cranes:	4
Number of rails:	9
Track length:	730 m
Reefer connections:	2,200


Truck OCR portals at CTA


Dual Rail OCR portal at CTA

The CTA requirements resulted in structural changes and adaptations of interfaces for data exchange. The rail implementation project started early 2015 and went live in May 2016. During the project, important changes to the civil structures were required to handle the 700m long trains, carrying up to 100 20-foot containers. The rail camera portal was constructed off-site, and afterwards assembled and erected on-site at CTA. Between the initial tests and the go-live of the new rail gate, only one week was required to correct and remediate operations preventing bugs.

Jan explains, "The train gate automatically scans and registers wagons and containers and verifies the data against the data sent via EDI by the railroad operator. The train composition data is used later in the process for the efficient and effective discharging and loading of the train." "Adding the rail gate and increasing the number of tracks will result in a total yearly rail handling capacity of 925,000 TEU per year for CTA", Mrs. Gerlinde John adds.

For the rail gate, high-availability and accuracy were paramount criteria during the tender and vendor evaluation process. Main differentiators making Camco the supplier of choice were the process knowledge and know-how and the personal skills of the team.

Key to success: keeping terminal users informed

Informing terminal users and convincing them of the benefits they will obtain from process optimization and automation are key in making technology implementation a success. Whenever procedures change, customers and truck drivers will resist the change, not in the least because they are afraid that change may impact their business. CTA carefully prepared a communication campaign to inform users about the processes and the benefits they bring to their business. Letters, roadshows and information meetings convinced the terminal users and prepared them for the optimized procedures supported by Camco technology. The majority of the trucking companies quickly realized the benefits and efficiency gains and adapted easily. For some the adaptation takes a little more time.

Accuracy, speed, availability & safety

The main benefits and return on investment of the projects implemented by Camco at CTA resulted in:

- Far better accuracy of the data entry.
- Significant increase in processing speed, reducing gate processing time.
- System availability is key for continuous operations. The Camco systems are very reliable, 24/7. Occasionally issues do occur. If support is needed, the helpdesk is there to help. In most cases issues are resolved remotely. The modular concept of the kiosks and gates usually allows easy and swift component replacement.
- Effective efficiency is achieved throughout the terminal processes, since better and accurate data leads to better planning and optimal resource usage for CTA.
- Time and Safety: automating gate processes for trucks and trains, is a great way to improve safety for terminal staff. The manual tally took considerable time and by using the automatic train gate, the speed of the process can be significantly improved.

Lessons learned

When asked about advice and guidance for terminals looking at implementing gate systems, kiosks or technology solutions, Gerlinde and Holger are eager to share their experience from the practice:

- Start with a crystal clear scope definition.
- Assign a competent and dedicated project team, with authority to optimize processes. Make sure that the team is available from the beginning until the end of the project.
- Clearly define specific requirements.
- Develop a good and detailed interface description.
- Take into account the scope and duration to be licensed by authorities.
- Define a strict timetable for the implementation with clear milestones.
- Understand the business of the terminal users, their needs and requirements.
- Define lean and mean business processes or optimize existing processes.
- Start with the basic, common processes and add specials later.
- Adapt the technology to fit the business processes and consult with experienced vendors to gain ideas on how to optimize processes.

The CTA team adds, "during the implementation there was room for improvement with respect to Camco's project management. When up and running, the systems are very stable and require little or no maintenance."

Outlook for the future

Mrs. John expects that in the future more technology will become available for terminals and more solutions will be implemented to increase customer service and make processes faster and even more reliable.

HHLA Container Terminal Burchardkai, Hamburg

INTERVIEW WITH THOMAS SCHÜTZ AND CHRISTINA EHLERS

HHLA Terminal Burchardkai is the largest and oldest facility for container handling in the Port of Hamburg. The first steel boxes were unloaded here in 1968 and today the terminal handles one in three of all containers in the Port of Hamburg.

The Container Terminal Burchardkai (CTB) is undergoing a long-term expansion to respond to the growth in ship sizes and volumes. The expansion of the automated block storage facility will absorb the peak loads resulting from the growing number of mega-ship calls. Five new container gantry cranes went into operation in 2014 and additional three gantry cranes, delivered this year, can handle the latest generation of 20,000-TEU ships.

CTB started using Camco technology in 2006. An OCR in-gate was installed and approved in 2009 and Camco card readers were deployed on the terminal to support the processing of trucks and to identify a trucker by using a smart card (Truck-ID system). In 2011 the first self-service terminals became operational. Changes have been performed consistently to improve or adjust the installed technology and processes.

A Service Level Agreement was signed in 2009 between CTB and Camco to ensure the availability of the Camco systems and to define the processes for incidents, maintenance and support.

In 2011 HHLA implemented the "Fuhre 2.0" program. This program improves the truck handling at the terminals and consists of a range of individual measures. For example:

- significantly accelerate the processing of trucks at the terminals
- reliable truck advance/pre-transport
- notification obligation
- slot booking procedure

The Camco components support this program.

CTB selected Camco after an intensive tendering process

Container Terminal Burchardkai launched a tender to implement OCR systems at the in-gate of their terminal in Hamburg, Germany in 2006. Camco was selected for the implementation.

HHLA CTB

Terminal and supplier need experienced staff to implement automation projects

Thomas Schütz, Managing Director, highlights the points of attention terminals need to observe when implementing OCR systems and automation:

- Have experienced staff involved. This goes for both parties: terminal and supplier.
- Have a clear contract clearly describing responsibilities and tasks of parties.
- Get the processes right and optimized.
- Be sure to allocate sufficient resources and capacity for the project.
- Make sure to involve the operators and the unions in the process when implementing automation solutions and create common understanding.

"The user experience is very good and all trucking companies accepted the system," says Christina Ehlers, Head of Terminal Administration Department. Every truck coming to the terminal is scanned at the in-gate, where truckers identify themselves using an electronic smartcard, the "Truckerkarte". In the future all trucks will need to be pre-announced. CTB is planning to add OCR systems at the out-gate.

Local and remote support

For the support of the installed systems, Christina highlights that there are two types of support to be considered: there is the software support and there is the hardware support. The software support is provided remotely from the Belgian HQ of Camco.

For the hardware support, Camco trained SCB (CTB service center) as a first level support. It is of paramount interest, that in case of a defect or damage, the system is up and running again with the shortest possible delay. Regular routines between Camco, CTB and SCB were established to check, review and improve the services continuously.

FACT SHEET CTB

Operational data

Area:	1.4 km²
Length of quay wall:	2,850 m
Berths:	10
Maximum draught:	15.2 m

Handling equipment

Gantry cranes:	30
Straddle-carrier:	133
Automated yard blocks:	8
Gate:	19 lanes
Clearance in yard:	46 truck lanes

Train

Rail-mounted gantry cranes:	4
Number of rails:	8
Track length:	700 m

HHLA CTB

Lübecker Hafen-Gesellschaft: Skandinavienkai & Seelandkai

INTERVIEW WITH TOM PATRIK ÖSTERREICH (INFORMATION TECHNOLOGY AND ORGANIZATION) AND TORSTEN LOHSE (TOS PROJECT MANAGER)

Terminal automation at LHG

Lübecker Hafen-Gesellschaft mbH (LHG) is Germany's largest port operator at the Baltic Sea. Lübeck offers not only ideal waterside and hinterland connections, but also profound expertise and cutting-edge handling equipment, achieving optimal fulfillment of their customers' requirements. LHG offers up to 80 departures a week to 20 partner ports around the Baltic and therefore guarantees the highest possible delivery reliability. LHG operates 4 RoRo terminals in Lübeck with a total surface of 156 hectares of which 27 hectares are covered warehouses. The terminals handle accompanied and unaccompanied RoRo and ferry traffic, general, project and heavy cargo.

To achieve operational excellence, LHG has implemented performance processes and procedures to deliver the highest quality and reliability to its customers. The processes are supported by high-end technical solutions and technology, and managed by the in-house developed IT system IHS (Integrated Harbour and Logistics System). This system is also being implemented for other customers in the Baltic Sea area.

For the effective and efficient gate handling, LHG relies on Camco technology, interfacing with the IHS. In 2015 LHG decided to equip its Skandinavienkai with Camco systems to improve the speed and quality of clearing vehicles visiting the terminal.

Tom Patrik Österreich and Torsten Lohse at LHG

Why Camco was opted as technology partner

Mr. Tom Patrik Österreich is responsible for the Information Technology and Organization department and explains how and why Camco was selected as preferred supplier, "After intensive market research, comparing technology, products, costs, the quality of the project management

LHG aerial view

FACT SHEET Skandinavienkai

Terminal area:	669,000 m²
Quay length:	2,065 m
Water depth:	> 9.5 m
RoRo berths:	9
Rail track:	12,000 m

Special features: Intermodal facility, trailer checking system incl. scanning portals, Pax gangway

Equipment: Tugmasters, translifters, forklifts, reach stackers

Main cargoes: Trailers, trucks, containers, new/used vehicles, heavy cargo, general cargo, dangerous cargo

and the overall solution, we decided to implement Camco's solution on the Skandinavienkai." The positive experience with Camco when their solution was implemented on the Seeland terminal, eight years ago, contributed to this decision, together with the good quality / price ratio. Mr. Torsten Lohse, TOS project manager, adds, "The knowledge and experience of the skilled Camco implementation team and the technical support are outstanding and Camco has proven to deliver when it comes to maintenance and 24/7 support."

According to Tom and Torsten, the reaction and response time during the negotiation phase could be improved and sometimes answers were required sooner. As a side note they added that this is not uncommon for growing technology companies focusing first on product and delivery quality.

When implementing the Camco systems, the integration with the terminal operating system was straightforward and seamless. This resulted in extremely fast gate processing times taking only 7 to 10 seconds for the OCR processing and sending the data to the IHS TOS.

In the initial phase, the OCR systems are used in combination with manned portal houses. In the future, LHG plans to further automate the gate process by using the barcodes printed on the documents provided by the shipping agencies to the truck drivers. The information connected to the barcode is received in advance via EDI and integrated in the TOS. This unique barcode is not only used as "gate pass", but also as ticket for the passage and on board of the vessel it may serve as cabin key.

Significant reduction in claims

The availability of high quality pictures drastically reduced the number of damage claims. When handling claims, the pictures serve as proof for the terminal and the shipping line resulting in important cost savings for both.

The automatic license plate recognition and container number recognition reduce failures introduced by human errors and contribute to the overall process efficiency.

Tom and Torsten advocate the introduction of uniform license plates and the ILU flag for all trailers in the European area and ideally the countries served by their vessels, "The status and condition of some license plates impact the overall results from time to time, but we need to bear in mind that bad license plates are also hardly readable by the human eye."

Dreaming of future enhancements

Mr. Tom Österreich believes that the security in the gate processes can be further improved by adding face recognition technology to identify truck drivers and passengers. Also, for a RoRo terminal the length of vehicles is crucial for the loading process. Vessels have a capacity expressed in load meters and are planned that way. Knowing the exact length of each vehicle coming through the gate is indispensable for the correct loading of the vessel. Further improvements of the accuracy of the length measurement (currently there is a margin between 5 and 10 cm) will prove beneficial.

A word of advice: Should Tom and Torsten install new systems or redo the installation, they would opt immediately for laser scanners at the camera portals, rather than implementing ground loops to detect trucks. Laser scanners are more efficient, accurate and economical. On top of that, the terminal saves money on the construction and civil engineering side.

"The Camco implementation team is not only technically skilled. They know and understand the processes and deliver a performing and reliable solution reducing the gate processing time and reducing errors. Our customers have observed a very significant reduction in the number of claims, reducing costs and risks."

FACT SHEET Seelandkai

Terminal area:	185,000 m²
Quay length:	400 m
Water depth:	9 m
RoRo berths:	3
Rail track:	2,700 m

Special features: Two container gantry cranes, trailer checking system incl. scanning portals

Equipment: Tugmasters, straddle carriers, translifters, forklifts, reach stackers

Main cargoes: Containers, trailers, new/used vehicles, heavy, project and general cargo

LHG camera portals

Impact of drone technology on Camco products

THE EMERGENCE OF DRONE TECHNOLOGY ALLOWS CAMCO TO DEVELOP MINIATURE, EFFICIENT, WIRELESS AND ECONOMICAL PRODUCTS

Hidden impact of UAVs on terminal automation

Drones today have a hidden impact on the terminal automation solutions market. Not drones as such, but the underlying technology used to develop them as well as the technology used onboard. The emergence of drones has brought along many new and interesting technologies, which Camco has implemented in its own products.

While everyone is talking about drones, these unmanned aerial vehicles (UAVs) have not yet been put into action on most terminal grounds, because of the many hurdles. Indeed, there still are many regulatory restrictions. To name a few: legal use of airspace, privacy, safety of the yard workers, environmental conditions, mandatory pilot license and authorisation of autonomous flights.

But in reality, drone technology is already transforming the terminal automation market. Drones need light-weight, economical, small and energy-friendly electronic devices to control their flights. Properties that also happen to be very interesting for automation products on container terminals.

At Camco we keep up with innovation. We have picked up the technologies used by drone software and hardware vendors and integrated them in our own products, to ultimately deliver better performing and more economical products. Let's have a look at a few of the latest technologies, steered by drone development.

Lidars: miniature laser detectors

A lidar is a device that uses an invisible laser beam to measure the distance to an obstacle. One lens projects the laser beam, while the other receives the reflected light. The previously bulky and expensive lidars have evolved into miniature, fast and economical devices, used to measure the distance from the drone to the ground.

© Tesla

Camco continually invests in **Research & Development** to stay on top of innovative technology.

Camco has integrated those miniature lidars in several products, which allowed us to design smaller and better performing product components. For instance, they are used to determine the configuration of containers passing in front of line scan cameras: two 20-foot containers versus one 40-foot. The laser beam is able to detect the small centimeter gap in-between two containers.

Real Time Kinematics GPS/DGPS

Terminals have been using GPS and DGPS positioning technology for years, mainly on RTG cranes, straddle carriers and terminal tractors, for registering the drop-off or pick-up location of containers in the stacks. But positioning detection techniques have evolved, as more precision was required for drones.

Positioning techniques based on Real Time Kinematics, such as RTK GPS, offer great enhancements. RTK GPS is the most sophisticated GPS solution available today providing almost centimeter accuracy. Unfortunately, it comes at a high cost and rather high power consumption.

© ublox

The drive to miniaturize RTK GPS solutions was also caused by the development of self-guided drones, needing localization systems when performing autonomous moves. Today, some vendors sell GPS RTK solutions for less than $700, fitting easily into a matchbox.

At Camco we have benefited from this GPS RTK technology and integrated it into our Positioning Detection Systems (PDS) products.

Micro location technology

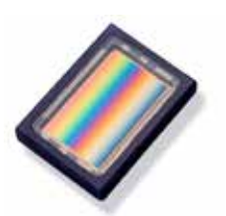
Particular areas on container terminals are obstructed from GPS signals, for example areas under the ship-to-shore crane, near the (A)RMG crane, or near a vessel. These obstructed areas are called GPS shadow zones.

Here, micro location technology can fill the gap. This technology is based on distance ranging by the use of low power 500 Mhz wide pulses in the unlicensed 3 to 8 Ghz band, called UWB-IR. Due to its centimeter accuracy and low energy it is used in high-end drones.

Camco integrated the UWB-IR micro location technology together with GPS-RTK into its corner stone product for PDS technology. Small UWB reference nodes are mounted into the four corners of the cranes and on light poles. The vehicles and people that need to be located are equipped with transponders. The accuracy is sufficiently high to automate TT or straddle alignment under the crane, as well as the auto-handover process.

CMOS image sensors

Today, about 50% of the commercially available miniature UAVs are used for aerial photography and videography. These trendsetting applications, where drones move at a certain speed, require global shutter image sensors that have a special pixel structure to avoid blurred images.



© imec

Belgium based research institute Imec, has designed hyperspectral versions of these sensors, fitted with a special coating. These hyperspectral image sensors are used onboard UAVs to do vegetation monitoring.

The same CMOS image sensors (without hyperspectral coating) are integrated into Camco's cameras. This solution provides high-level performance with a minimum in size and cost.

IPT wireless power transfer

Lithium batteries are the preferred power sources for most drones. In best case, battery life extends to 30 minutes. In an autonomous drone operation, charging should be automatic and fast. Drone sub-suppliers such as Divisek Systems are today designing wireless energy transfer solutions. Inductive Power Transfer (IPT) is one of the used techniques.

© Divisek

Simply explained it's based on two coils, which are close together as in a transformer. One coil is attached to the drone's bottom while the other is built into the landing/charging dock. At the docking station, energy is wirelessly transferred between both coils.

Camco designed a similar solution for its BoxCatcher crane OCR solution, where the camera unit autonomously moves on a dynamic rail.

Simply put, the rail features an integrated primary coil across its full length, while the moving camera includes the secondary coil in a double "U" encapsulating the primary cable. On every position across the 36 meter rail, we are able to transfer up to 500 Watt energy by use of a resonant inductive coupling. This energy is used to power the cameras as well as to charge the internal lithium battery.

A Camco UAV in the future?

By actively taking part in several drone research projects in Belgium, Camco stays on top of the latest developments.

This article demonstrates how fast we act to integrate new emerging technologies into our existing products. This know-how, combined with our expert engineering teams, will ultimately lead to Camco developing its own UAV product. But as mentioned at the start of this article, an international legal framework is a precondition to launch this type of challenging products.

New Projects

HPC - HAIFA PORT CORPORATION

ISRAEL

Construction of a fully integrated Automated Cargo Gate system at Haifa Port Corporation in Israel. The gate will combine kiosk gate lanes, inspection stations, comprehensive OCR portals, Gate Operating System and software to optimally service truck operational flows.

Haifa Port is Israel's main maritime gateway handling containers, general cargo, fuels ... It includes two container terminals with a combined future capacity of 2.5 million TEU.

FACT SHEET HPC

Design

- Surface: main port zone extends over 70 hectares
- Carmel Terminal: length 700m, depth 15.8m
- East Terminal: length 960m, depth 14m

Equipment

- STS Gantry Cranes: 20
- Rail Mounted Gantry Cranes: 30

Terminal Operating System

- NAVIS N4

Camco Systems

- Truck OCR portals: 9 + 2
- Truck pedestals: 17
- Exit gates with 4 lanes

© HPC

CONTARGO EMMELSUM

GERMANY

Construction of a new intermodal terminal in Voerde-Emmelsum, in the port of Emmelsum, Germany. The terminal will offer easily accessible multimodal connections with seaports for industries near the mouth of the river Lippe. The new Contargo terminal will have a 300m quay and two rail modules for handling 85,000 TEU.

Camco will implement a rail OCR system, as well as an automated gate system with two OCR portals and five truck pedestals, for automating the in and out processes.

FACT SHEET CONTARGO EMMELSUM

Design

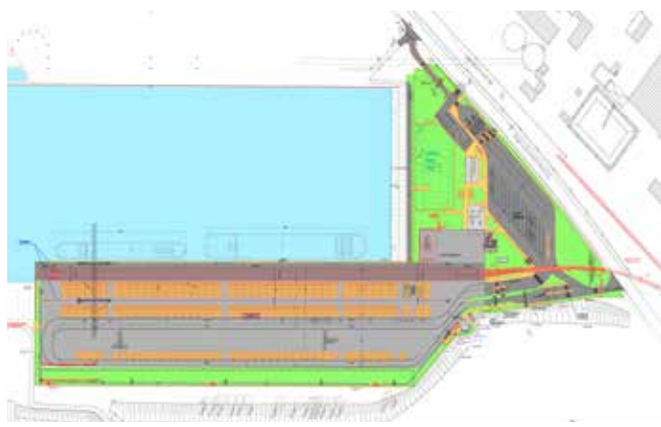
- Surface: initial area of 46,000m^2
- Quay length: 300m
- Two rail modules of 315m for handling 85,000 TEU
- Depot space for 1,400 TEU

Equipment

- Bridge cranes: 1
- Reach stackers: 1

Camco Systems

- Truck OCR portals: 2
- Truck pedestals: 5
- Rail OCR portals: 1



Design plan for Contargo Emmelsum

NPCT1 - NEW PRIOK CONTAINER TERMINAL ONE

New Priok Container Terminal One is the first terminal of Indonesia's New Priok development (Tanjung Priok, Jakarta). The terminal will be equipped with deep drafts and the latest facilities to serve mega container vessels.

When fully completed, NPCT1 will have a handling capacity of 1.5 million TEU. The terminal will be operated by PSA International. Camco was awarded the introduction of the Gate Automation System.

FACT SHEET NPCT1

Design

- Surface: 32 hectares
- Container berths: 3
- Quay length: 850 m
- Max depth: 16 m
- Design capacity: 1.5 million TEU

Equipment

- Super Post Panamax quay cranes: 8
- Rubber Tired Gantry cranes: 20

Terminal Operating System

- COSMOS

Camco Systems

- Truck OCR portals: 6
- Truck pedestals: 6

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NSIGT - NHAVA SHEVA INDIA GATEWAY TERMINAL

New standalone container handling facility at the Jawaharlal Nehru port in Navi Mumbai, India. Nhava Sheva (India) Gateway Terminal will be operated by DP World.

Camco was awarded the construction of the Automated Gate System.

FACT SHEET NSIGT

Design

- Surface: 27 hectares
- Container berths: 1
- Quay length: 330m
- Max depth: 16m (13m in approach channel)
- Capacity: 0.8 million TEU

Equipment

- Quay cranes: 4

Terminal Operating System

- ZODIAC

Camco Systems

- Truck OCR portals: 4
- Truck pedestals: 12 + 4

© NSIGT

New Projects

APM TERMINALS MOBILE
ALABAMA, USA

Introduction of a double-stacked Rail OCR portal at APM Terminals Mobile, situated in the US Gulf. The portal is equipped with intelligent line and area scan cameras, RFID, sensors and lighting systems. With APMT Mobile's planned expansions, annual throughput capacity will grow to 1.3 million TEU.

TRAPAC LOS ANGELES
CALIFORNIA, USA

Introduction of a double-stacked Rail OCR portal at TraPac terminal in Los Angeles. The facility consists of 210 acres of container yard and three vessel berths.

HHLA CONTAINER TERMINAL
ALTENWERDER, GERMANY

Further automation of the HHLA Altenwerder Container Terminal at Hamburg by implementing a Rail OCR portal. The customized rail portal covers dual rail tracks. Key requirements were maintenance safety and high availability.

EUROGATE CONTAINER TERMINAL
BREMERHAVEN, GERMANY

Installation of 20+ truck pedestals at Eurogate Container Terminal Bremerhaven as part of the further automation plans for the terminal gate area.

SMPA - SOCIÉTÉ MANUTENTION
PORTUAIRE AQUITAINE BORDEAUX

Introduction of a Rail OCR portal solution at SMPA's Verdon-sur-Mer terminal. Complemented with gate process and yard handover process automation, including transaction kiosks and LSTP kiosks.

SEAYARD FOS 2XL
FRANCE

Installation of 28 LSTP/Grid Kiosks at Seayard FOS 2XL's interchange areas. These LSTPs will assist truckers during container transfer processes. Seayard FOS 2XL is one of the main container terminals at the Mediterranean Sea.

Rail portal at HHLA Container Terminal Altenwerder

TraPac Los Angeles: installation site for rail portals

WatchPoint: Centralized monitoring of equipment and applications

Camco's recently released WatchPoint allows proactive monitoring of customer equipment and applications. Customers can use this centralized platform to follow up on the current status of their on-site installed truck gate, rail gate and crane systems. Problems can thus be quickly identified and appropriate actions taken. The WatchPoint monitoring service will be part of the standard Camco Service Level Agreement for installations starting in 2016.

The WatchPoint monitoring application constantly checks and updates the status of Camco-specific systems installed on the different locations of the terminal. It provides customers with one centralized overview for the status of all truck gate, rail gate and crane equipment and applications. For example, WatchPoint clearly indicates if a camera is no longer available in a truck OCR portal, or if a kiosk printer is offline. Customers will thus gain faster and better insight in the health status of their systems.

"Clients will get an overview of their monitored equipment and services per predefined area. For example, one terminal can have separate areas for truck gate, rail and crane activities", says Bart Grauwels, Software Team Leader at Camco. "In case a particular area experiences problems, this is indicated on the WatchPoint start page. The customer can then quickly zoom in on the affected area and get more details on the specific problem."

The built-in user management system enables customers to create and control user accounts on terminal level. Specific staff members can be assigned to follow up on specific terminal equipment.

One overview for truck, rail and crane equipment

A few examples of what is monitored:

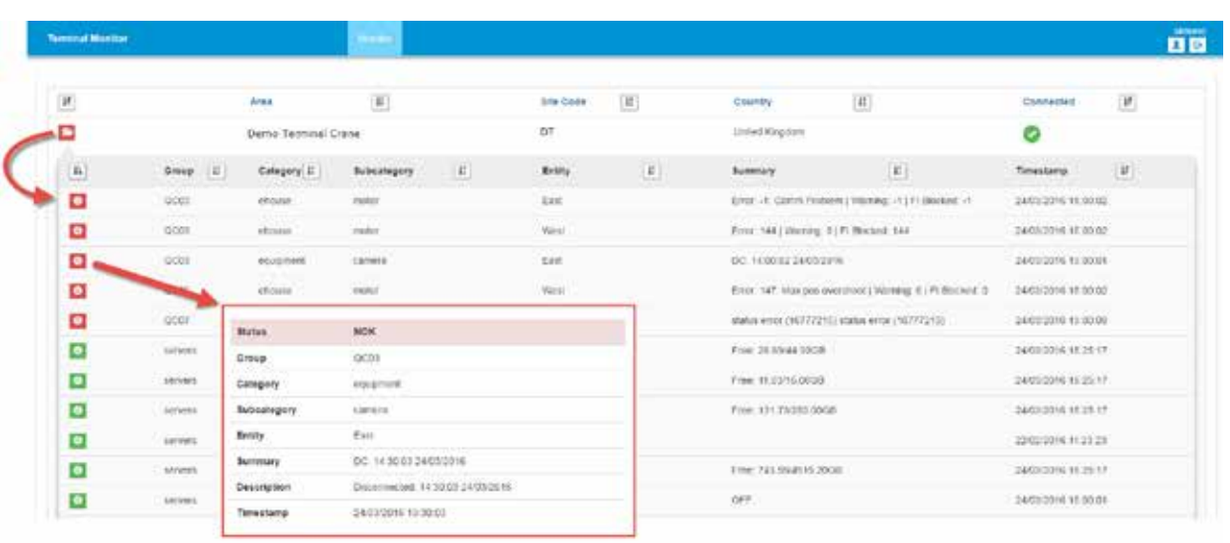
- OCR cameras: detection of connection issues, image streaming issues
- Camera portal lighting
- Kiosk printer status
- Servers: CPU, memory, disk space usage
- Database connections
- Interface with the TOS

The range of monitored equipment and applications is constantly expanding. In the future, WatchPoint will also support anomaly detection.

Benefits for clients

Introducing WatchPoint will improve the overall availability, productivity and reliability of the Camco services. Customers will be more in control. They will have one central and unified monitoring tool and be able to proactively detect problems and take necessary actions. Potential risks can be identified and addressed before they become critical and impact operations.

Screenshot of Camco's WatchPoint monitoring application



Meet the people behind the support cases

SINGLE POINT OF CONTACT FOR CUSTOMERS TO RESOLVE ISSUES.

Many of you have already called our support team, to obtain information or to request help. Most of you however, may not know where you're calling or whom you're talking to. Well, it's time you meet our support team.

Camco's support team has recently grown to seven people, who are all based at our main office in Leuven, Belgium. Together, they offer 24/7 remote support, in Dutch, English, French, Spanish, Portuguese and South African. The team functions as the single point of contact for all service calls, spanning all continents and time zones.

Camco Support Team

24/7 helpdesk via email or phone

"The main goal of support is to solve operational issues within the shortest time," explains Nadine Paredis, Operations Manager. "Equally important is problem management: preventing recurrence of incidents and minimizing the impact if incidents do occur. This is done by following specific processes and keeping information about problems and workarounds up-to-date and readily available in our knowledge base." Support will deliver services according to the agreed SLA conditions.

When you contact support, one of the first-line support engineers will try to collect as much information and diagnostics about the incident as possible. Your call will be logged and managed through Camco's dedicated trouble ticketing system. If the first-line support engineer is not able to resolve the problem, the incident will be escalated to second-line support for further troubleshooting. Third-line support is provided by the software development team or project engineering team. When a support call is closed, an automatic email notification is sent containing all required details on the case.

Dedicated support contact

The support team thus provides customers remote support via email or phone for both hardware and software problems. These services include the diagnosis and correction of product malfunctions, errors and failures. Continuous product training ensures that the support engineers stay on top of things. Advanced tools are used to remotely monitor and access customer networks and systems, troubleshoot, restart services and systems and adjust configuration settings.

Each customer is assigned a dedicated support representative, providing one centralized contact for further customer inquiries or operational needs. He or she will plan maintenance, help to organize any product part replacements (RMA) and field service interventions (FSI), or help out with general inquiries.

Monthly service reports

To improve overall customer satisfaction and to ensure that the support goals are met, the support team can provide monthly customer service reports. Such a report provides detailed information on the support cases over the previous month.

Support cases are categorized by severity, ranging from low to medium, urgent (reduced business) and critical (business standstill).

The monthly report provides more information on what caused the problem and how it was resolved. It furthermore lists the status of the open and planned FSIs (Field Service Interventions) and RMAs.

Number of support calls (2015)

- Total: 4171
- Outside business hours: 783 (18,7%)
- Reported issues not related to Camco installations: 23%

Number of service interventions

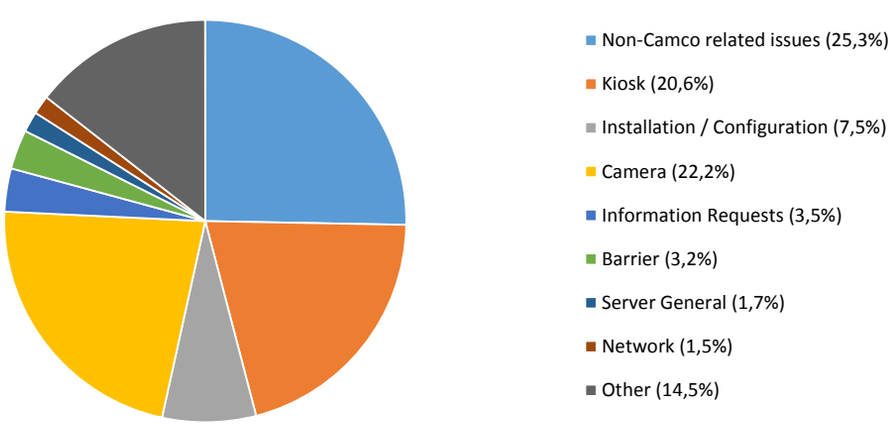
- Total: 1051
- Average per month: 88

Contact Support

Email: support@camco.be

Phone: +32 16 40 41 41

Reported issues and attributed causes



TOC EUROPE
www.toc-events.com

Camco Technologies is the leading technology company in innovative terminal automation solutions and services. Since 1999, our systems empower marine and railway terminal operators to increase their performance and safety while reducing operating costs.

Already 150+ terminal operators worldwide successfully optimized their gate, crane, rail and yard processes using our highly accurate OCR technology, robust kiosk systems and advanced Gate Operating System.

Interested? Contact us! Our dedicated and experienced team will assist you in designing, implementing and integrating the solution that best meets your specific needs.

www.camco.be - sales@camco.be

CAMCO TECHNOLOGIES

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