Improving the efficiency within container terminals is dependent on adapting new ideas and technologies to the flexible handling of standard containers. With this in mind, TTS can improve capacity and system reliability; reduce manning requirements; and generally improve the cost-efficiency of container port logistics.
Adaptive systems for container handling in container terminals

Manual cassette container handling system

The key TTS innovation in this field is the implementation of the container cassette as a ‘floating buffer’ between container cranes and all horizontal transportation, i.e. the vehicles transporting the container to or from the road or rail carrier. Using this system, containers are disconnected from the equipment moving them, leaving the cranes to work without stopping.

The TTS LT translifter is designed to be coupled to any universal towing tractor. These manually operated vehicles lift and move the cassettes and, together with the cassettes, create a flexible and reliable system for all terminal ‘housekeeping’ demands.

The TTS LT straddle carrier is designed to handle TTS container cassettes.

TTS container cassettes are designed for single and double stacking of containers for both 2 x 40’ and 4 x 20’.

TTS can offer various vehicles which are fully adapted to this system and all designed to handle TTS container cassettes. The system can be adapted to any type of terminal management demands for different operation modes, for instance manual, semi-automatic and fully automatic.
Automated cassette container handling system

Automated Guided Cassette (AGC) system

With the correct configuration of automated systems, high productivity and efficiency can be gained in the handling of containers both within container terminals and between closely located terminals. Optimised solutions for ensuring current berth productivity may promote the need for more terminal equipment such as cassettes and AGCs instead of additional cranes which are often the most expensive part of the system.

Whilst the TTS AGC system is an efficient and flexible container handling system optimising the horizontal transport between quay cranes and yard stacks, the system can also be utilised in other areas of the container terminal, for instance from the yard stack to the railhead.

In addition to the C-AGVs (container cassettes), the TTS AGC system comprises a navigation system and a traffic management system, both of which are able to communicate with the most up-to-date TOS systems.

The navigation system comprises rotating lasers and SICK scanners at each end of the C-AGV which are also used for vehicle safety. The C-AGV also navigates by means of dead reckoning, using the information received from the scanners, and continually verifies its position by cross-bearings.

CP-train

TTS CP-train system is the efficient way to handle container batches between closely located terminals. The CP-train is designed to run on a standard railway gauge and can be controlled in manual, semi and automatic mode depending on the application.
The conventional method of securing containers to cassettes employs twistlocks, involving the use of personnel on shore to both attach and remove them. The use of rigid terminal cassettes, along with cell guides for double stacking, removes the twistlock convention from the container handling procedure, increasing safety and decreasing cost as no personnel are needed to interact with the mechanisms.

The cell guides are equipped with ‘corner cones’ into which the containers are easily located. The 2 x 40’ arrangement has guides at each end, while the 4 x 20’ requires an additional guide between the two stacks.

Port planning and simulation

TTS employs simulation, 3D modelling and animation in the port planning process. Inset: A simulation study by the independent consultancy TBA B.V. has been performed, comparing the TTS system with other relevant manual and automatic systems.