TTS, in cooperation with Swiss technology company Numexia, has developed a groundbreaking range of automatic guided vehicles (AGVs) for container handling using contactless energy transfer technology. The cassette AGV, or C-AGV employs this energy-efficient system which enables the vehicles to meet zero emission requirements. The vehicles have a generous load capacity, and can carry cassettes with double-stacked FEU or two TEU in a single tier.
The contactless energy transfer technology contains ground-based and vehicle-based units. The two key components to the ground-based system are the power electronics element and coils, which enable the C-AGV to receive energy under both the quay crane and the stacking cranes areas. The vehicle-based system employs the same technology and uses super capacitors to store the energy, which is then used by the specially designed electric wheel motors.

C-AGVs have a load capacity of 61 tonnes, and can carry cassettes with double-stacked FEU or two TEU in a single tier. Major innovations to manoeuvrability have been made by incorporating individual, electrically-driven and steered bogie axles which enable the C-AGV to be moved in any direction and to turn through 360 degrees. This increases the versatility and flexibility of the vehicle while minimising congestion at the quayside.

The use of the traditional AGV in container terminals has become more widespread, but the C-AGV further improves flexibility and manoeuvrability in that the vehicle can be steered conventionally or ‘crab’ diagonally, or it can move completely transversally. New cassette designs enable the vehicle to enter and exit both transversally and longitudinally, enabling decoupling at the quay side, which is the key to the entire system’s cargo handling efficiency.

In addition to its energy efficiency, the C-AGV offers several benefits. It is easier to decouple under the quay crane – a function that is seen as a primary requirement in the terminal operating industry. The pattern of cassette lanes and highways combined with the vehicle’s manoeuvrability means that a much higher number of quay cranes can be served more easily compared to other solutions, without losing capacity due to congestion at the quayside. Also, less quayside space is required since the turning radius of the C-AGV is, remarkably, under its own axis. The versatility of the C-AGV also helps to improve the productivity of stacking cranes – for stacks orientated both perpendicular and parallel to the quay.