Case Study

Powering a Smart Deepwater Port at Vietnam's CMIT Terminal with Darveen VT-779W & VT-879 Vehicle Mount Computers

Cai Mep International Terminal (CMIT), located in the Thi Vai area of Cai Mep in Vietnam's Ba Ria–Vung Tau Province, is one of the country's leading deepwater container hubs. The terminal is operated as a joint venture between APM Terminals (Maersk), Vietnam National Shipping Lines (VIMC), and Saigon Port.

CMIT earned second place in the 2018 Asian container port performance rankings, placing it among the top-performing container terminals in Asia. Able to handle ultra-large container vessels (ULCVs) and with an annual capacity of up to 1.15 million TEUs, CMIT is a key trade gateway linking Southeast Asia with Europe, North America, and Asia.

Application

To accelerate its digital transformation and speed up container movements between the yard and the gate, CMIT equipped its fleet with two Darveen rugged vehicle mount computers: the VT-779W on container trucks and the VT-879 on rubber-tyred gantry (RTG) cranes.

Integrated with the terminal operating system (TOS), the two terminals connect the control center, truck drivers, and crane operators in a single data loop. Work orders are pushed to equipment the moment they are issued, while container numbers and bay positions are sent back in real time, bringing visible, fine-grained control to everyday yard operations.

Challenges

Running a TOS-connected fleet at a tropical coastal port puts every piece of onboard hardware to the test:

- Harsh tropical, coastal climate. Year-round heat, high humidity, heavy salt spray, and direct sunlight cause standard commercial devices to suffer screen degradation, corroded connectors, and overheating shutdowns.
- Unstable vehicle power. Frequent starts and heavy-duty operation on container trucks and RTG cranes create sharp voltage fluctuations and surges, demanding robust power protection.
- Constant vibration and shock. Bumpy yard surfaces and continuous crane machinery vibration require a mechanically hardened design.

- Seamless connectivity in a dense yard. Tightly stacked containers create signal-shadow zones. Terminals need intelligent Wi-Fi roaming and strong 4G/5G cellular performance to keep data flowing without interruption.

Solution

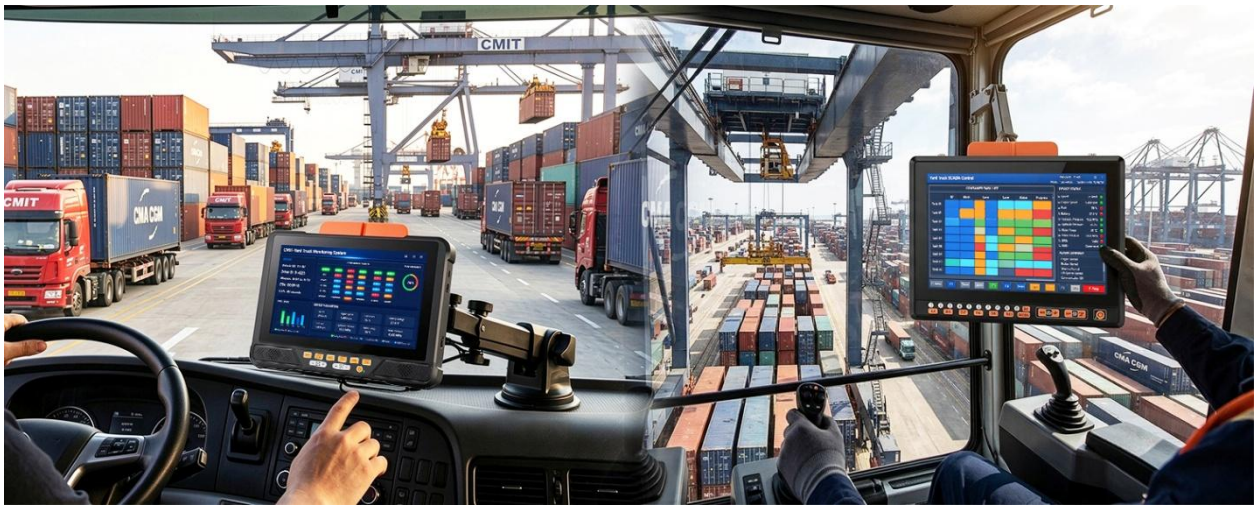
VT-779W 10.1" Rugged Vehicle Mount Computer for Container Trucks

Installed on container trucks, the VT-779W displays dispatch orders, provides positioning and navigation, reports job status back to the TOS, and gives drivers a simple, intuitive interface.

- **Bright, glove-friendly touchscreen**: 10.1" 1,000-nit display stays easy to read in direct sunlight and responds to gloved hands.
- **TOS-ready performance:** Intel Core i5 processor and Windows 11 for full compatibility with the terminal's TOS dispatch client.
- **Driver-friendly controls:** Physical, customizable shortcut keys on the front panel for fast, safe operation.
- **Built to survive the yard:** Rugged aluminum housing with fanless cooling, IP66 protection, and MIL-STD-810H shock and vibration certification.
- **Wide-voltage power input:** 8–36V DC with built-in protection to withstand voltage spikes at vehicle start-up.
- **Always connected, always located:** Seamless-roaming Wi-Fi, 4G/5G, and multi-constellation GNSS for accurate positioning and reliable real-time data return.

VT-879 12.1" RTG Crane Vehicle Mount Computer

Mounted in the RTG crane cabin, the VT-879 delivers a graphical bay view, container position alignment, spreader status monitoring, and safety alerts.



- **Large screen, fast input:** 12.1" 1,000-nit display with numeric and function keys lets operators confirm container positions and enter data quickly, with TOS instructions clearly visible even in strong light.
- **Smooth graphics performance:** Intel Core i5 processor and Windows 11 power a graphical TOS interface with fluid rendering.
- **Rugged for crane duty:** Aluminum housing with excellent vibration resistance and wide-temperature operation from -30°C to 60°C, ready for the shock and temperature swings of RTG cranes.
- **Flexible I/O:** LAN, COM, USB, and more for easy connection to RFID readers, PLC controllers, barcode scanners, and other industrial peripherals.
- **Dual network assurance:** Wi-Fi plus 4G/5G keeps the crane cabin and the ground control center synchronized with minimal latency.

Results

Working together, the VT-779W and VT-879 delivered measurable operational gains for CMIT:

- **Faster container truck turnaround.** Drivers receive optimized dispatch routes and container location guidance in real time. Combined with precise GNSS positioning, this sharply reduces aimless searching and idle waiting inside the yard.
- **Smarter, more precise RTG operations.** The VT-879's 12.1" screen and physical number keys give operators a clear view of bay layouts and instructions, cutting screen switching and manual input errors.
- **Lower maintenance costs.** Rugged hardware stands up to heat, salt mist, and vibration. Device failure rates dropped noticeably, reducing IT maintenance effort and cost across the terminal.
- **A fully closed-loop TOS data chain.** Seamless roaming and dependable data transmission give the yard control center a near real-time view of every mobile machine and truck, creating a truly visible digital yard.

Darveen worked with local Vietnamese partners to provide CMIT with on-site installation guidance, interface development support, and after-sales technical service. With the VT-779W and VT-879, CMIT has bridged the information gap between ground transport and overhead lifting, driving more efficient deepwater port operations.

About Darveen

Established in 2007, Darveen is dedicated to developing rugged industrial computing solutions tailored to the diverse needs of vertical industries. Our product portfolio includes vehicle mount computers, industrial panel PCs, industrial displays, embedded box computers, and rugged tablets. With nearly two decades of experience in product design and manufacturing, Darveen's solutions are widely adopted in smart ports, warehousing and logistics, and heavy-duty vehicle applications. Riding the Industry 4.0 wave, Darveen is expanding its reach into edge computing, smart manufacturing, industrial automation, healthcare, and marine sectors.

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