Automate & optimize terminal loading operations

TerminalManager™
Emerson's next-generation Terminal Management System (TMS)
for the automation of terminal operations

EMERSON™

Take Control by Unifying Your Terminal Automation and Management Systems.

Efficiently meet your customer and market requirements by taking a synergistic approach to managing the infrastructure, automation, and information needed to move product into, within, and out of your terminal. Emerson's TerminalManager™ allows your staff to leverage advanced visualization tools that accurately model your assets to maximize throughput, ensuring your operation remains competitive and profitable well into the future. With more than 30 years of terminals experience, we offer both deep industry expertise along with the most complete solution, including a full stack of Emerson hardware and software offerings. From field devices to central business systems, Emerson will deliver a turnkey solution tailored to meet the specific needs of your operation.

Minimize manual loading processes
Result: Reduced incidents with the ability to repurpose limited resources to higher-value activities

Optimize asset usage
Result: Minimized truck turnaround times and maximum terminal throughput to boost site P&L

Ensure safe and accurate loading
Result: No spills, no over/underloads, and no off-spec blends

Get centralized visibility to site-wide operations using better data visualization
Result: More accurate planning and quicker, better decision making

Maximize facility uptime
Result: Ability to consistently achieve challenging throughput and customer satisfaction targets

What if you could maximize results across your terminal operations by giving your staff a site-wide view in a single automation platform?

TerminalManager — Your Solution to Maximize the Efficiency, Productivity, and Profitability of Your Terminal Operation.

Data Management

Manage terminal data locally or sync with a centralized ERP. System data is available for real-time graphics, historical reporting, and analytics.

Order Management

TerminalManager supports scheduled orders as well as allocation/quota loads. Orders can be entered directly into the system via local console, intranet portal, or captured in an ERP system and synced to the local terminal. For allocation/quota loads, the system can manage locally or sync with an outside system to prevent truck loading once the allotted quantity has been lifted.

Planning & Scheduling

Compare tank TOV to ordered quantities to ensure available capacity. Site traffic can be managed through timeslot booking with optional rules to prevent entry outside of scheduled times.

Pre-load

The system maintains site safety by only granting access to drivers/vehicles that have passed the required authentication steps, uniquely configurable for each site. Upon site access, the system can automatically print the loading instructions for the driver. If using automated bay-queuing, TerminalManager can display queue status in a driver waiting area and inform a driver when to proceed to the gantry. TerminalManager communicates directly with scales to capture in-weight and verify the truck is within tare weight tolerances, ensuring the truck is not arriving with a heel.

Loading Execution

- **Preload Validation**
  Before authorizing the load, the system always ensures safety permissives are in place prior to authorizing the load. Optionally, the system can validate available quantity (tank inventory and/or stockholder) prior to the load.

- **Support for Single and Multiple Loading Arms**
  Combined with a preset batch controller, TerminalManager handles all aspects of automated vehicle loading, from recipe management to real-time blending/additive control. Where supported by a preset batch controller, TerminalManager can support loading operation through single arms or multiple simultaneous arms.

- **Blending and Additives**
  With blending and additive management and control, the quality of loaded product is always assured in-spite of interruptions during operations.

- **Offline (Manual) Loading**
  In the event a batch controller is placed in local mode for manual loading, the system automatically retrieves the manual transaction upon reconnection to TerminalManager. The transactions can then be associated with the Loads created in the system.

Post Load

Transaction details are archived for each loading operation performed.

- **Sealing Operations**
  Capture seal numbers directly in the system via HMI.

- **Bill of Lading (BOL)**
  An automated or on-demand BOL document is generated in a fully-customized format for each completed load.

- **Exit**
  Driver/vehicle validation at the exit gate ensures prevention of unauthorized vehicle exit.

Bulk Movement Measurement

Capture custody measurements for bulk movements for a complete view of inventory levels throughout the terminal. The calculations within the application adhere to industry standard API algorithms.

Inventory Management

Track product inventory in all tanks within the terminal whether dedicated or co-mingled storage. Capture physical stock either manually or automatically from ATG. Easily reconcile book and physical inventory positions.

Information Disbursement

TerminalManager supports both SAP Crystal Reports and Microsoft® SSRS for flexible custom reports. In addition, 35 core reports are included with the base application that can be further customized to specific customer needs.
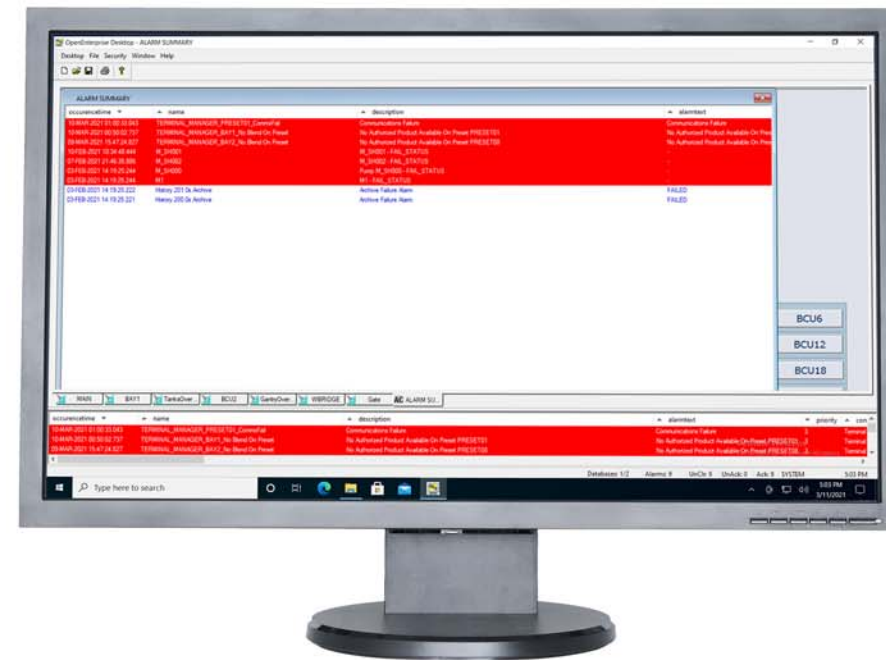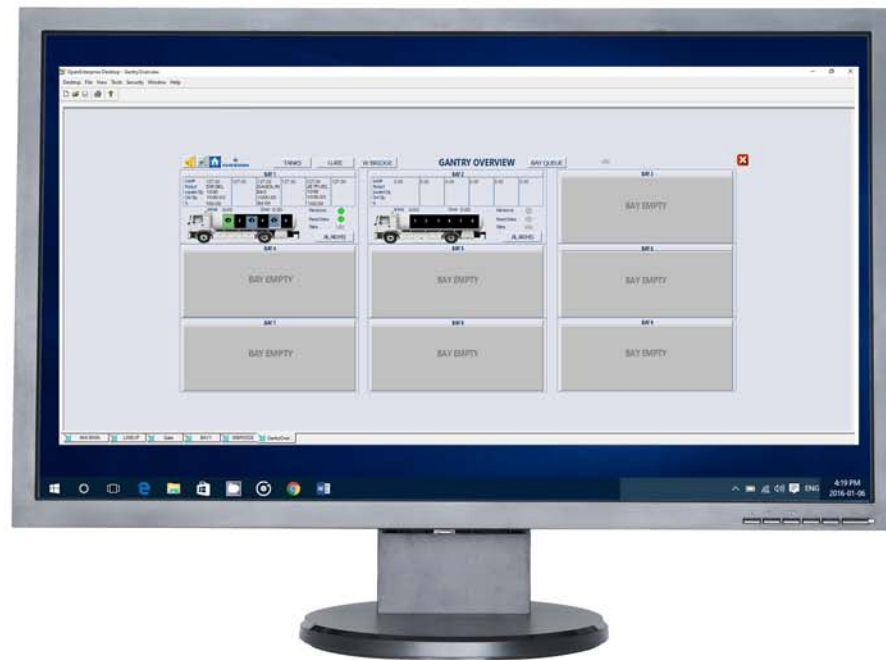
Sample of Core Reports

- Loading Advisory Note (LAN)
- Bill of Lading (BOL)
- Planned vs Delivered
- Alarms and Events
- Loaded Trucks
- Operator Actions
- Truck Movements
- Exceptions
- Pending Trucks
- Pending Trucks
- Tank Gain / Loss
- Component Totalizer
- Loading Time
- Trip Time
- Manual Density Changes
- Day Start and End
- And more

Introducing TerminalManager Visualization Tools.

Emerson's TerminalManager with advanced visualization tools is designed to enable terminals to achieve challenging goals related to operations, safety, and personnel.

Single Unified Operations Interface*

Whether your terminal is manned or unmanned, you can easily achieve real-time visibility to your terminal operations from the gate to the jetty. TerminalManager with enhanced visualization allows you to centralize all day-to-day operational data in a unified operator console, using digital visualization to provide a single, site-wide view of your entire terminal in real time. Based on human centered design principles, the display prioritizes the most critical information to reduce operator eye strain and minimize fatigue.
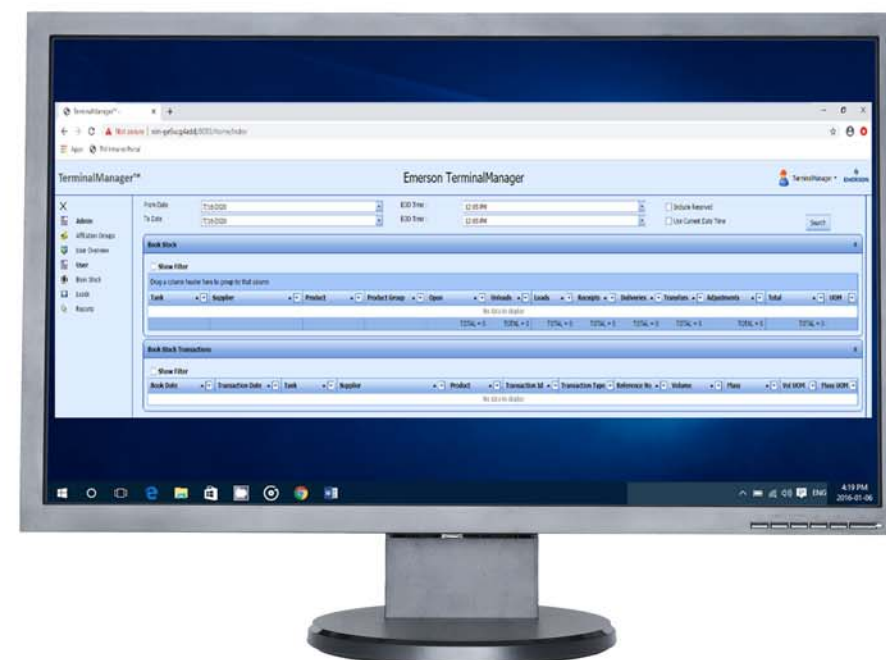
Centralized Alarm Management*

Centralize alarm visibility and management in one system. Users are quickly alerted to every TerminalManager and preset alarm and can take the appropriate action on each one directly in the console. All alarms are associated with an onscreen asset such as a card reader or preset, allowing for graphical representation of the alarm to pinpoint the issue for rapid resolution. This integrated alarm solution ensures site safety is always a priority.

Dynamic Site-specific Graphics*

Track every action in your terminal in a single, customizable platform. Our configurable operator console provides the flexibility to align the system to your terminal and to your operator's needs using an intuitive, pre-built library of user-selectable objects. The result is a dynamic, graphical view of your entire terminal that displays the information that you and your staff decide is most critical to your operation with the ability to display data in a tiered manner to focus on specific operations and/or asset performance.

Intranet Portal

A lightweight intranet portal (optional) can be deployed to access key information, including orders, BOLS, book inventory positions, reports, and dashboards. The user security model also allows for access by both internal and external parties. The user roles can be defined to only allow each user to see appropriate screens or data, such as inventory transactions specific to a specific stockholder. Note that a secure VPN is required to safely grant external access as the portal runs on the corporate network.

* This feature requires pairing of TerminalManager with Emerson's OpenEnterprise™ software.

TerminalManager Streamlines Terminal Operations in a Single Software Platform.

TerminalManager is Emerson's built-for-purpose Terminal Management Solution (TMS) that ensures efficient, accurate, safe, and secure material transfers for both manned and unmanned tank storage facilities. This complete solution will help you optimize handling of both inbound/outbound movements and related internal activities. Whether you operate an unmanned, single bay crude unloading facility or a massive chemical refinery terminal with hundreds of complex products, TerminalManager is a scalable, highly reliable solution that is appropriate for terminals of all sizes.

Gain total visibility to all aspects of terminal management.

TerminalManager provides a complete overview of your terminal, enabling all personnel to monitor critical activities across your facility. The system is a single source of data for movements, real-time load rack visibility, inventory positions, and physical stock on hand. Alerts and alarms are always visible for swift action and resolution.

Streamline loading and unloading operations.

TerminalManager streamlines the management of all aspects of product transfers and material movements for truck, railcar, and barge loading/unloading.

In a world of data, make the most of it.

TerminalManager provides out-of-the-box connectivity to a host of physical devices and includes MessageBroker for software integration with any third party solution, enabling seamless consolidation and disbursement of your critical data.

Ensure safety and security, the #1 priority.

When dealing with hazardous products and situations, keeping your people and the environment safe is paramount. From authorizing site access for approved personnel to ensuring all loading permissives are in place (i.e., overfill protection or ground), TerminalManager helps you maintain safe operations and remain in compliance.

Gain Total Visibility to All Aspects of Terminal Management.

Terminal operators need to know what is happening in the facility, day and night. Whether a driver is having difficulty entering the facility, a weight is out of tolerance, or an alarm has activated, you need this information to be available and visible. With TerminalManager, your staff will receive timely notifications and can take quick action and get resolution, minimizing the impact to your terminal operations.

What's your challenge?

Lack of visibility into the terminal processes and assets requires manual activities and work-arounds. These manual steps either require additional manpower or take skilled terminal personnel away from high-value tasks.
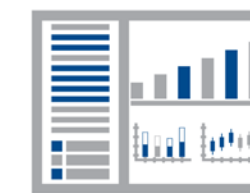
What's your opportunity?

Employ a Terminal Management System (TMS) to consolidate information, standardize and automate processes, issue an alert when manual intervention is required, and close the accounting process quicker.

Achieve Full Visibility with a Single Application

Operations Management - From gates to gantries, give operators in the control room a remote, site-wide view to control loading activities and ensure materials are moved safely, accurately, and on time.

Intranet Portal - Operators can view orders, BOLs, inventory, and reports from anywhere, anytime with a browser and corporate network access.

Double Vision - Operators can watch in real time as drivers interact with Human-Machine Interfaces (HMIs) as messages are dispatched from TerminalManager.

Efficiently Manage Product Loading/Unloading Operations

Stock Check - With a TMS that monitors and calculates the quantity available to load and available space in the tank, checks can be done when planning and prior to loading authorization.

Blending & Additization - Handle all aspects of recipe management for sequential and ratio blending plus add one or more injected additives at the gantry, with alerts generated if blend ends out of tolerance to catch the issue before the vehicle departs.

BOL Printing - Capture volume and weight automatically on the BOL form of your design. Printing can be triggered automatically or done in a secure manner to ensure drivers can only retrieve their respective documents.

Account for Product and Optimize Invoicing

Stock Accounting - Track all movements in and out of tankage, whether captured by a preset batch controller, manually entered, or brought in via another interface for either a single supplier (dedicated) or multiple concurrent suppliers (comingled).

Reconciliation - Easily compare book and physical inventory positions. Catch small losses before they become larger and track how gains or losses match up with contractual loss allowances. Create book adjustments to true up book to physical position.

Timely Invoicing - Close the books faster with accurate, real-time transaction updates from your TMS to your accounting system. With real-time data, you can invoice customers quicker and with greater accuracy.

Streamline Loading and Unloading Operations.

Without operational visibility, managing assets can be time-consuming and introduce delays that impact terminal throughput. TerminalManager gathers and consolidates real-time data and delivers the information to personnel within the terminal to identify constraints and ensure their awareness of the conditions. Our system also allows operators to easily perform scheduling and slot booking to prevent crowding, minimize back-ups, and prevent delays. Optimal gantry usage ensures products being loaded are delivered accurately and on time, improving terminal throughput.

What's your challenge?
Vehicles need to move through the facility as quickly and efficiently as possible to prevent backups and delays.

What's your opportunity?
Reduce the delays that impact terminal throughput by removing manual processes and improving planning/scheduling, real-time load rack visibility and asset usage.

Effectively Plan and Schedule Terminal Loading/Unloading Activity

Time Slot Booking - Planning is essential to guarantee on-time delivery which is why TerminalManager provides a slot booking tool that allows booking and enforcement of truck loading times, avoiding delays at the terminal.

Bay Queueing - When a truck arrives, our TMS can automatically assign the optimal bay and informs the driver where to go, avoiding traffic congestion at the bay and optimizing use of the asset.

Traffic Management - Terminals often have limited space to handle trucks onsite. The system's Slot Booking and Bay Queuing are effective tools for controlling vehicle traffic, improving truck turnaround time and reducing safety incidents.

Use Tailored Workflows to Minimize Manual Processes and Delays

Entry Gate/LAN - Before granting a driver/vehicle access, the TMS can ensure the driver's license and training is up to date, validate an available order, and also provide printed information at the gate to help drivers efficiently navigate the facility.
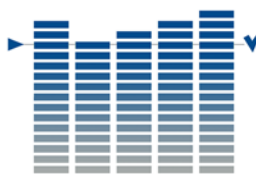
Configurable Sequences - Make sequences (entry/exit, weigh, gantry loading, etc.) as compact or complex as desired and tailor for direct driver interaction or for an operator. Use similar sequences in other operations for user familiarity and repeatability.

Smart Scales - Store vehicle tare weights and compare to actual in-weights with out of tolerance weight generating an alert to prevent loading over top of an unexpected heel. To-load weight is recalculated per in-weight to mitigate overloads.

Optimize Facility and Personnel Utilization

Asset Utilization - Achieve maximum usage of all terminal assets such as pumps, meters, valves and gantries by tracking all activities and utilization, ensuring operators have valuable information to optimize product movements.

Limit Downtime - A running site is a utilized site. Our robust TMS minimizes manual operations and avoids any re-work. Multiple redundancy options, from cold standby to a fault-tolerant hot standby, offer ultimate uptime.

High Value Tasks - With process automation and optimization routines, a site can run with fewer personnel — and in some cases, unmanned. Eliminate manual processes and allow operators to focus on planning and scheduling to improve terminal efficiency.

In a World of Data, Make the Most of It.

Without centralized visibility into complex terminal data, activities, and transactions, your personnel must put additional effort into gathering that information. Collecting and aggregating information from a variety of sources and processes — often with manual data recording/transfer — could lead to transactional records that are fraught with errors and losses. TerminalManager ensures all critical data is captured and managed in a single system to streamline record keeping and expedite the invoicing process.

What's your challenge?

Your information is trapped in disparate and disconnected systems, making it necessary to rely on manual processes and manual data entry for workarounds.

What's your opportunity?

A single, integrated repository for inventory transactional data ends the search for missing records. With a full complement of transactions from an array of sources, the system can accurately manage supplier book stock and perform book to physical reconciliation within a single application platform.

Put Key Data at Your Fingertips

Data Management - Easily and accurately consolidate transactional data from multiple sources to create a single view of the terminal using locally or centrally-managed master data elements.

Audit Trail - Capture and archive audit information for every event that can be accessed as needed for further analysis to help quickly resolve customer disputes.

Dashboard - Quickly create powerful graphical views for visualization of terminal performance and analytical analysis.

Streamline Distribution of Critical Terminal Data

Automated Report Distribution - Group, configure and email reports to one or more distribution groups that include internal and/ or external parties. An entity parameter ensures external reports are pre-filtered to company-specific data only.

Driver Performance - All driver-related events are timestamped and archived. Measure and report performance to carrier and/or customer with details such as truck turnaround time, driver training compliance, and upcoming license/registration expiry.

Trip Duration - Minimize trip delay impacts with automation of the driver/vehicle validation process to quickly determine if access should be granted.

Rely on Scalable, Integrated Solutions from Emerson

DELTAV™ OpenEnterprise™

TankMaster™

Synthesis™

Integration to Control Systems - Our TMS supports OPC connectivity to control systems, including Emerson's DeltaV™ and OpenEnterprise™ SCADA. Additionally, DeltaV can also be leveraged as a virtual preset batch controller.

Integration to Automatic Tank Gauging (ATG) - Seamlessly connect to Rosemount™ TankMaster, Rosemount 2460 Hub, and other third-party ATG solutions to capture, view, and report tank data directly in the TMS application.

Integration to Synthesis™ - TerminalManager is designed to seamlessly communicate with Emerson's Synthesis Order-to-Cash Software for management of multiple terminals via a single, centralized enterprise system.

Ensure Safety and Security, the #1 Priority.

Terminal facilities inherently carry risk, including hazardous product exposure, high pressures and temperatures, and heavy machinery, to name a few. It is paramount that software and hardware solutions work in unison to help reduce these risks as much as possible — with measures such as explosion-proof cases for hardware in C1D1 areas, validating product compatibilities, and protection of sensitive data. TerminalManager is designed to help your operation maintain high safety standards while protecting the security and integrity of your information.

What's your challenge?

With various safety risks at a site, the TMS must play a key role in preventing and mitigating dangerous situations.

What's your opportunity?

As a fully-integrated TMS, TerminalManager helps prevent safety issues and can alert personnel of issues before they become more serious.

Keep Your Data Safe and Your Site Running with Cybersecurity

Network Design - Critical for smooth daily operation, TerminalManager's network design helps minimize vulnerabilities with a separate TMS network and limited/controlled intercommunication with other networks.

System Hardening - TerminalManager systems undergo a standard hardening procedure which includes system patches, unnecessary application removal, appropriate user permissions/access, and penetration tests.

Whitelisting and Antivirus - Combine a whitelisting solution to only allow authorized system changes and an antivirus solution to prevent malicious attacks. Add a disaster recovery strategy to fully safeguard your TMS investment.

Automate Access with Site Security Management

Access Control - TerminalManager supports automated entry and exit from a terminal site, including gate/alarm activation.

Identification - Positive identification of driver and vehicle can be performed by proximity cards, pin codes, biometric scanners, RFID tags, license plate readers, and more for automation of access control.
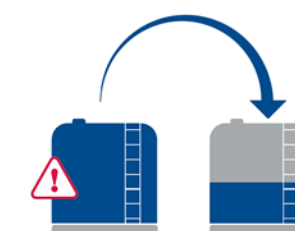
Validation - Once the driver and vehicle are identified, TerminalManager can be configured to confirm the driver has not been locked out, his/her driver's license and training are current, and vehicle registration and insurance are valid.

Load Safely in Hazardous Areas

Explosion-proof - Many products handled in a terminal can create potential explosion hazards. All hazardous-area devices are tested and certified to meet or exceed the safety designation of the area (i.e., C1D1 or C1D2).

Overfill Prevention - Maintain an incident-free operation by accurately tracking product on board and the exact amount that can be loaded based on compartment capacity (physical overfill protection devices are still required).

Contamination Control - The TMS tracks the material/material group last loaded in a vehicle/compartment and prevents mixing of incompatible materials to prevent contamination or a dangerous/explosive mixture.

An Integrated Set of Tools and Features in a Single System.

TerminalManager is designed to help your staff gain greater system expertise over time to maximize your investment, leading to increased throughput, fewer safety incidents, and higher customer satisfaction.

Time-Saving Tools

Dashboard

Go beyond reports with a graphical view of your data that can be easily manipulated by business/end users – no coding.

Driver Messaging

Send customized messages to drivers or operators anywhere in the field with an HMI and capture/validate responses as part of the workflow.

Message Broker for Integration

Create software interfaces with this simple, out-of-the-box solution that also provides the ability to build an interface for any third party application when you need to go beyond interfacing to an ERP. Run any type of executable file using the task scheduler – one of several additional tools in Message Broker.

Automatic Report Distribution

Easily schedule and send a single report or group of reports to multiple distribution lists, with each distribution list only receiving the data they are intended to receive.

Intranet Portal

Setup a browser-based portal on the corporate network to access key functions, including order entry/view, BOL view, book inventory position, reports, and dashboards. A security model is included that allows for third party access via secure VPN connection.

Advanced System Features

Adaptive Workflow Orchestrator (AWO)

Easily configure workflows by selecting from core workflow sequences using the system UI. Meet unique terminal requirements by customizing base sequences as needed.

Role-based Security

TerminalManager integrates Microsoft® Windows®-based security with application level security. Application areas can be secured using a layered configuration that is based on user-defined roles.

Language Support

Each user can view system screens and enter data in the ASCII or Unicode language of their choice, including alarm messages.

Data Archival

All events, including alarms and driver interactions, are captured in the system logs for integrity and system auditability.

Redundancy

From cold standby to fault-tolerant hot, TerminalManager has multiple redundancy options. With the hot standby option, automatic failover from the primary to the secondary server preserves state and ensures no data is lost.

Device Integration

TerminalManger seamlessly communicates with a full complement of Emerson devices as well as common devices from other manufacturers.

A complete portfolio of solutions that address terminal operations from field to enterprise

	ISA-95 LEVELS	APPLICABILITY	EMERSON PRODUCTS
Refinery / Pipeline / Business Planning / Terminal	Level 4 Business Management	Enterprise: Transport Network Optimization	TransportPlanner™
		Enterprise: Commercial "Order to Cash"	Synthesis™
Entry	Level 3 Operations Management	Site: Planning and Scheduling	TerminalScheduler™
		Site: Operations for Truck/Rail Movements	TerminalManager™
Loading	Level 2 Automation & Control Systems	Intra-terminal Automation	■ DeltaV ■ TankMaster™ ■ AMS Suite ■ Electronic Presets ■ Flow Computer/Controllers ■ Automation Controllers ■ Valves and Regulators ■ Flow Solutions ■ Tank Gauging ■ Smart Wireless
		Tank Inventory Management	
		Gantry and Bay Automation	
Storage Tanks	Level 1 Field Devices & Instrumentation	Measurement and Final Control	

Emerson brings a unique combination of deep terminals industry expertise combined with the most complete set of solutions, including a full stack of hardware and software offerings — from rugged field devices to intelligent central business systems.

A range of services to maximize the value of your terminal management system
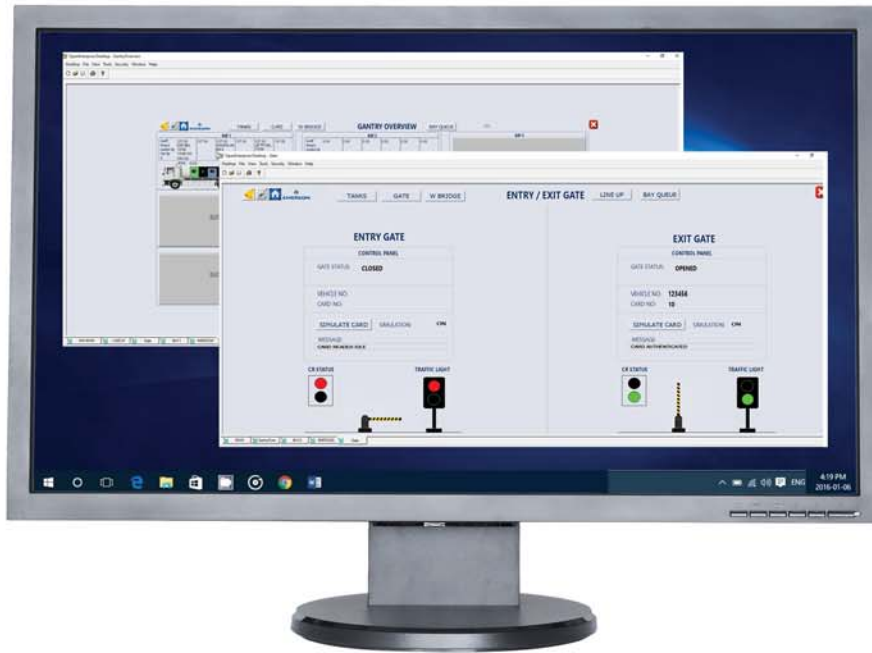
Maximize uptime, extend the life of your system, and improve your bottom line by keeping your investment in peak operating condition. Emerson's wide range of Lifecycle Services are designed to help you get the most value from your terminal management system.

- Project Engineering, MAC, MIV
- Training and Education
- Consulting Services
- Lifecycle Support
  - Telephone and Email Support
  - Resident Engineer Support
  - Remote Support
  - System Upgrades

Take a Scalable Approach to Fulfill Your Terminal Needs Long Term.

Implement a flexible, scalable solution to cost-effectively meet future requirements. Our scalable TerminalManager will easily evolve as needed, allowing for standardization on a single platform for continuity of operations.

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RemoteAutomationSolutions

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