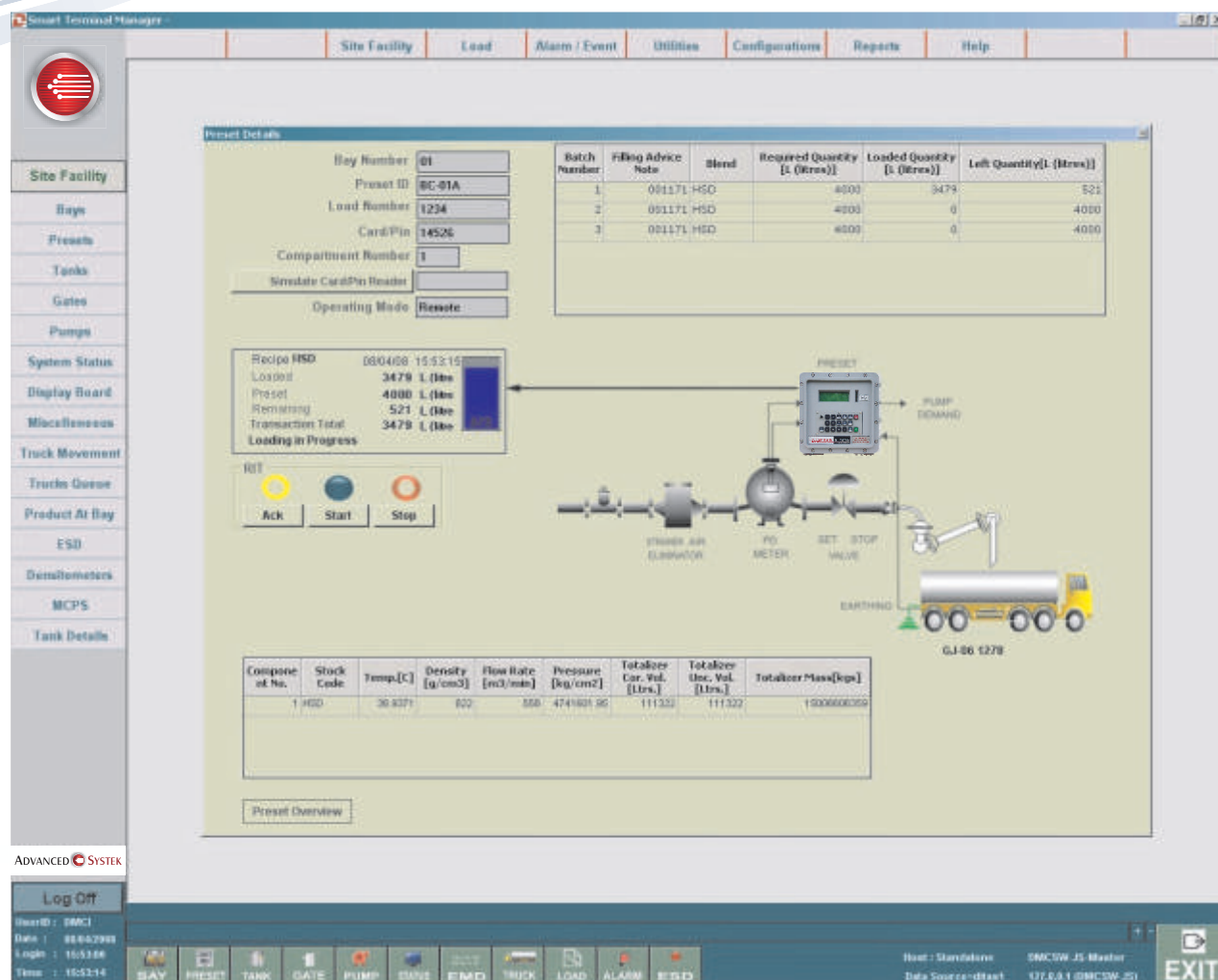


## SMART TERMINAL MANAGER

We offer Integrated, advanced and comprehensive Terminal Automation solution using "Smart Terminal Manager (STM)" software. STM offers next generation-advanced features in addition to those offered by the earlier AUTOLOAD Software.



A Typical Smart Terminal Manager (STM) Screen

STM facilitates and streamlines the entire operation of the Terminal and provides quality management information by integrating functions of various systems, namely Gantry equipment, Tank Gauging, Weigh Bridge, Pumps, PLC etc. and commercial activities of the Terminal.

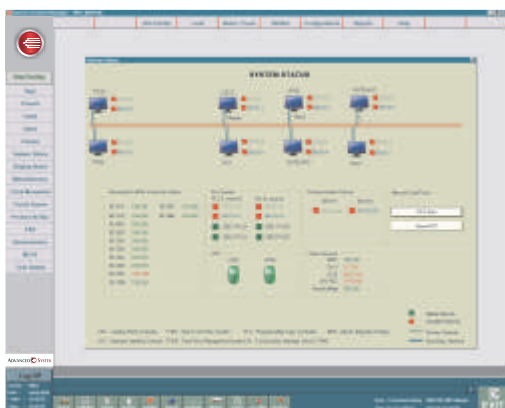
STM has the flexibility to adapt to the User's needs and maximize the benefits that integrated Terminal Automation provides. STM makes loading accurate, simpler, safer and more secure. STM is built upon the solid foundation of several man-years of our experience in Terminal Automation applications.

This document briefly describes the Functions and Interfaces supported by the enterprise version of STM. A reduced feature economical solution for a smaller terminal can also be offered.

# STM Functions and Features

## Terminal Management

- GUI based screens provide overview of the Terminal, Load progress, Alarms, and various controls at a touch of a button



- Automation of Product receipt (Pipeline / Railcar / Barges), storage and dispatch (Loading into Trucks / Railcars / Ships) processes
- Inventory Management and reporting (Volume or Mass based)
- Optimization through bay and slot allocation to increase efficiency and throughput of the Terminal.
- Security features include Access control, interface to CCTV systems, configurable levels of access with passwords, time-stamped audit trails for each event, controlled truck entry using automated barrier gates etc.
- Supports various types of Proving methods like Compact Prover, Master Meter Prover, Mobile Prover tank etc
- Multi-language support to quickly change the screens to local languages
- Field proven interface to Host / ERP Systems such as SAP R/3®
- History, Archive of Loads and Alarms.

## Diagnostics

Reports and sub-system level graphical indication of failures.

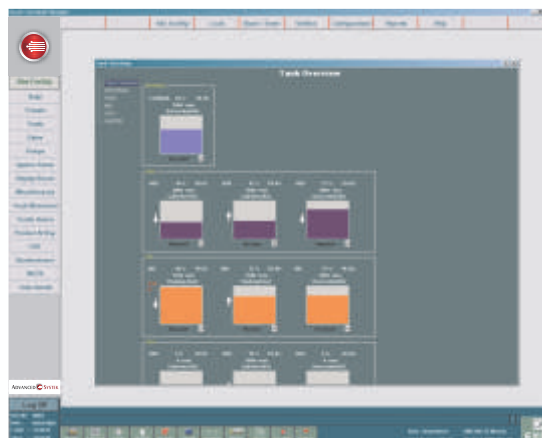
## Loading / Unloading Automation

- Interface with a combination of different presets at any given site.
- Supports Additive injection at each loading point or at the header and blending of up to 4 products

- Automates Valve control, Firewater Engine, ESD.
- Efficient Pump sequence control.
- Multi level fall-back mode of operation

## Tank Farm Management

- Proven interface to various industry standard Tank Gauging Systems
- Multi-Company Terminal with complex additive strategies and supports co-mingled stock
- Operator can view & control inlet / outlet MOVs
- Storage Management with inter-tank transfers



## Asset Management

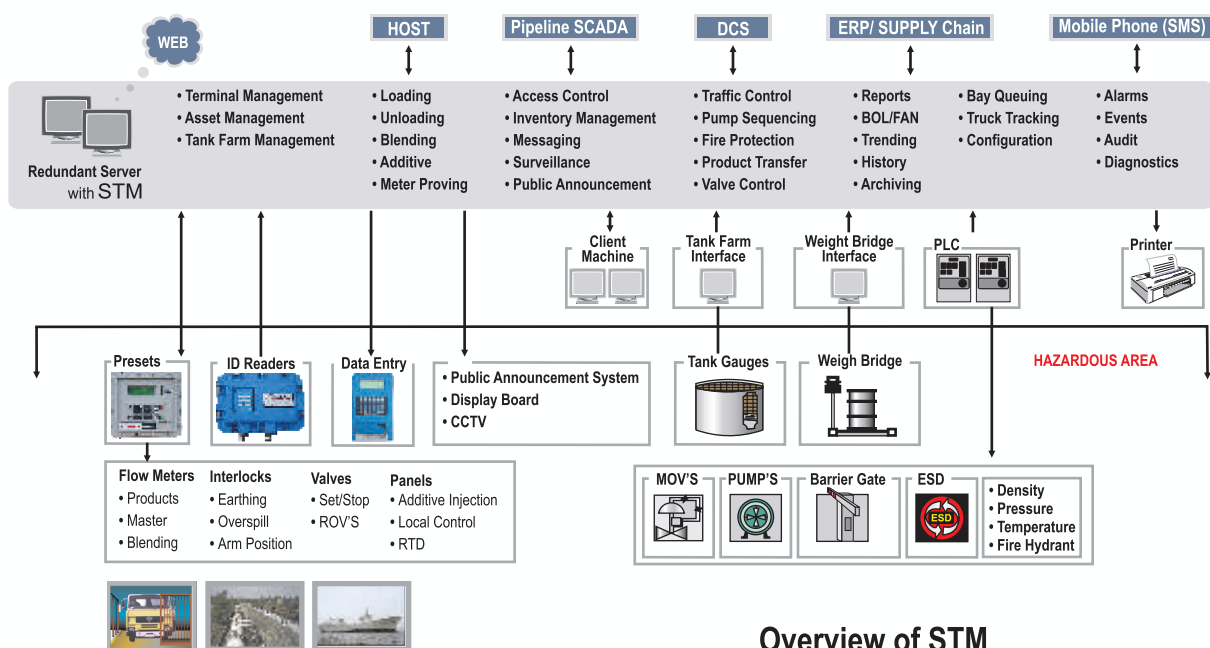
Facilitates management of maintenance and service records of Terminal assets

## Reports

- Configurable End of Shift, End of Day, End of Month
- Terminal Throughput
- Inventory and Product reconciliation
- Product transfer
- Filling Advice Note and Bill of Lading
- Alarm and Event Summary / Audit Trail

## Help

Provides guidance for the use of STM software and the meaning of various screen fields and facilitates backup / restore of archival data.



Overview of STM

## Configuration

STM provides powerful, exhaustive yet user-friendly configuration facility. It allows user to independently and easily add/update the followings

- Product** : Stock or Product, Stock group, Stockholder, Blends, Additives etc.
- Site Facility** : Devices, Bays, Tanks, Pumps, Valves, Gates, Weigh Bridge, ESD, Computers etc.
- User info** : User Group, Password, Menu, profiles Cards, Customer, Vehicle, Driver, Contractor etc.
- Parameters** : General, Time outs, End of Period, Reports, Languages, Units, Messages, Holidays, Events, Presses, Device drivers, Register Settings, List values, Alarm etc.

## Multi Operator Facility

System provides facility access to multiple operators in the terminal. Each operator or Stockholder can monitor data pertaining to his operation.

## Load Scheduling

With proper Password access allows Terminal Managers or customer to book or allot the available time slot on a specified day in advance

## Independent Operation

In the event of non-availability of Host computer, STM facilitates operator to set up loads and generate necessary documents.

## Stand Alone Operation

STM database can be updated by uploading data from the Presets operating in standalone mode.

## Help

Provides guidance for the use of STM software in the meaning of various screen fields and facilitates backup and restore of archival data.

## Technical Features

- Developed on Microsoft Windows® 2003 Server platform using latest Microsoft.NET® tools.
- Uses open standard, ODBC SQL database like Oracle 10g, which provides a highly secure environment for this application.
- Supports OPC Server/Client configuration. Any DCS system such as Delta-V can access the process data using OPC.
- High availability of the system and operation through redundant Servers and Dual TCP/IP Networks.
- Facility to provide Web access using a separate IIS server setup to access the Web enabled pages.
- Connectivity to Messaging Server for Mobile Phone interface (Alarms and messages also can be sent as SMS to the concerned personnel).

STM provides interface to most of the widely accepted smart field devices or the sub systems, including the following

STM provides Interface to	Make/Type	Function / Purpose
HOST / ERP System	SAP®/JDE®/TDM/RAMCO/etc.	The Host / ERP system downloads the scheduled load and receives the loaded details from STM.
Presets	Danload, Petrocount, Accuload®, 869S Island Controllers, Contrec®, Alma etc.	To accurately control the dispensing of batches of Products.
Access Control Devices	Wiegand ID Reader, Proximity ID Reader, Biometrics, Touch type ID Reader	To provide access to the specific area within the Terminal and permission to load can be restricted based on different levels of authorization. It supports traffic management.
Flow metering device	PD Meters, Turbine Meters, Coriolis etc.	To accurately measure the flow in Volume or mass.
Weighbridge System	Mettler Toledo, Sartorius, Sanmar, Avery, Ashbee etc.	To register the Tare and Gross weights of Tank Trucks for cross verification.
Density Measurement	Bopp & Reuther, Micromotion, Solartron, E&H etc.	To measure product density accurately.
Programmable Logic Controller (PLC)	GE Fanuc, Allen Bradley, Modicon, Siemens etc.	To monitor and control Product Pumps, Entry / Exit Gates, Emergency Shutdown, Fire alarm System, MOV's and other Plant Interlocks.
Meter Proving System	Brooks Compact Prover, Open Volume Proving Tank, Mobile Meter proving skid.	To prove flow meters in the Terminal and determines their K-Factors / Meter factors.
Tank Farm Management System	SAAB, Enraf, Endress + Hauser, SBEM, etc.	To display levels, volumes, stocks and supports tank strapping table.
Display and Public Announcement System	Team Power, Magneto Dynamics etc.	To display and announce the Tank Truck numbers
Fire Fighting System		To start the fire engines automatically or manually
Valve Control System	Limatorque, Rotork	To operate the MOV's for receipt and dispatch of product either through Master Control Station or PLC.
Barrier Gate System	Heidz, Metachem	To provide authorized entry / exit at the Terminal gate.
DCS System	Delta V, Yokogawa, etc.	Serial or Ethernet Interface to DCS via OPC, MODBUS or any proprietary protocol.
Blending Systems	Daniel, Brooks	Presets at individual loading point can be configured for In-line proportional, In-line non-proportional and Sequential blending. Online blending system at the Header Line also can be provided.
Additive Injection System	Daniel, Chemtec, Toshniwal	To accurately dispense additives into the petroleum products.

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