ITAS

INTEGRATED
TERMINAL
AUTOMATION
SYSTEM

| Startup Picture | Terminal Overview | Bay Overview | Truck Schedule | LA Status | Truck Status | UDT | UDT | UDT | UDT |

ITAS is a product developed by experienced hands who understand two most important factors-the **user** and the **process**. Immense hard work, spanning over a period of time and practical experience of implementing terminal automation projects has been the guiding spirit of the team working on this product. It is this experience, which delivers not just a whole range of functionalities to the system but a lot more.......

Flexibility and foolproofing in configuration and user interface. A terminal automation system, by its nature, requires a high level of interaction with the user as well as the process. ITAS designers have taken a special note of this factor by providing flexibility in the system which allows ITAS to be tailored to the requirement of an individual project.

Adaptability to customer environment. Modular blocks, which constitute ITAS, are built ensuring adaptability of individual blocks to project specific requirements. It provides easy changes in the existing modules, adding new modules and expanding the system anytime to integrate more equipment in future.

Easy to understand system Detailed and perfected user manuals make ITAS a very user-friendly system.

.... ITAS with these unique features protects customers' investment in the product for a long term making it highly cost effective.

For Help, press F1   Connected to SSSMMI(192.168.1.100)   07-05-2001 1

Main Components of ITAS System Architecture

ITAS MAIN SERVER

DATA ACQUISITION & CONTROL SYSTEM

MAN-MACHINE INTERFACE

SYSTEM ENGINEERING
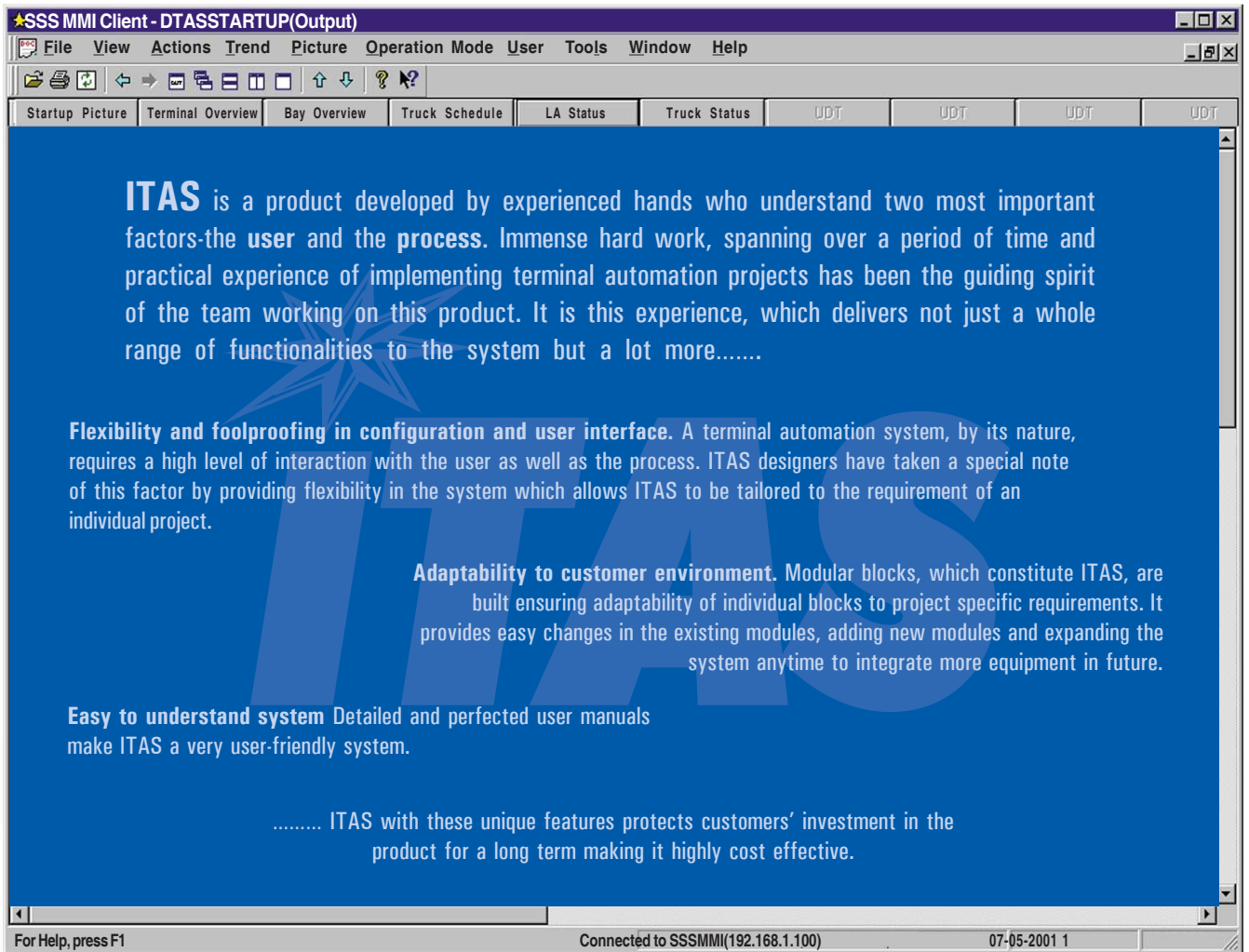
ITAS MAIN SERVER

Vehicle Registration

Supports Multiple Registration points

Checks Registration Inputs for validity

Enables Dynamic BAY Allocation

Supports Multiple Scheduling

Manual Truck Schedule Registration

Field	Value
Truck Registration No.	TR-0001
Truck Customer Name	CUS1_IOCL
Truck Entry Priority	Low
Compartments to Load	2
Round Trip Time	1 days 0 hrs 0 mins.
Schedule Time	07-05-2001 19:20

☑ Sealing Flag — Sealing Flag No. SF0001A
☑ Self Fuel Flag — Self Fuel Qty. 150.00
☑ Invoice Flag — Invoice No. INV-0001A

Compartment Details

Compartment	Product Code	Qty. to Load
1	HSD	500
2	MS	1000

OK   Cancel

ITAS main server is designed to perform :

- ♦ Vehicle Registration
- ♦ Truck Terminal Automation
- ♦ Wagon Loading Automation
- ♦ Plant Control
- ♦ Product Inventory Management
- ♦ Customer Computer Interface

Truck Loading Business Operation :

- Records and stores truck loading information
- Logs events and generates alarms
- Produces Filling Advice Notice (FAN)
- Prints Bill Of Lading (BOL) and invoices
- Tabulates End of shift/day/month processing
- Reports Product gain/loss
- Generates System Reports
- Generates Truck Movement Reports

Truck Terminal Automation

Truck Loading Automation Operation :

- Validates Truck entry & exit
- Communicates with devices at loading bays
- Performs controlled truck filling
- Monitors Safety Inputs
- Supports Manual bay allocation
- Supports blending of products and additives
- Supports degraded mode of operation
- Provides Bypass Entry/Exit sequences from Operator Station
- Bay Officer Data Entry Terminal and Card Reader for Sequence Overrides

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Wagon Loading Automation

Controls Wagon entry & exit

Communicates with devices controlling loading

Performs controlled wagon filling operation

Monitors safety Inputs

Records wagon loading information

Logs events and generate alarms

Supports blending of products and additives

Generates Filling Advice Notice (FAN)

Generates Business Reports & Prints invoices

Plant Control

ITAS Monitors and Controls

- All MOVs in the Plant
- Product receipt from Pipeline
- Batch Scheduling
- Terminal Pressure/Flow
- Online Meter proving
- Tank-to-tank transfers
- Outgoing Pipeline
- Safety Systems (ESD)
- Alarm Handling
- Pump Demand Logic

Integrated Terminal Automation System
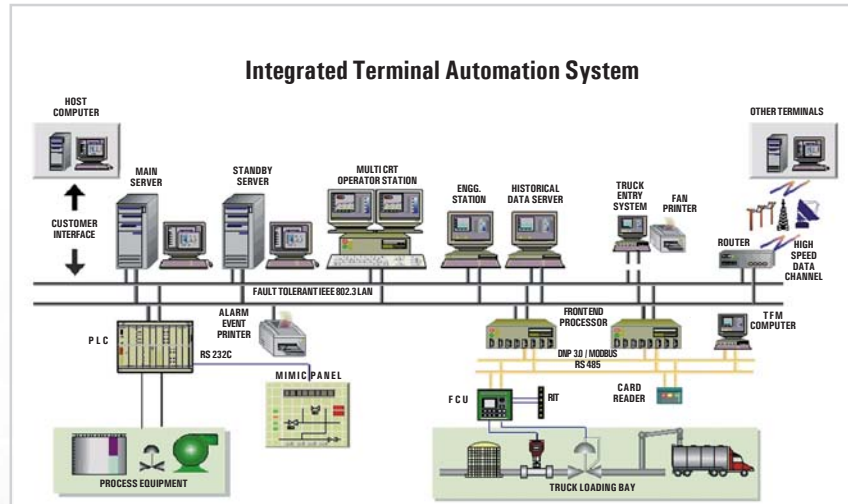
Product Inventory Management

- Monitors Terminal's product receipts/ dispatch

- Monitors Tank levels and volumes through Strapping Tables

- Monitors Tank level alarms

- Displays Tank Details (as an object)

- Measures base, sediment and water gross volume

Customer Computer Interface

For registration of trucks/wagons, a customer's application is used. The terminal automation system must interact with this application for :

- Receiving registration data
- Truck/wagon cancellation after registration
- Sending post-loading data

In ITAS it is possible to implement any of the following interfaces.

- Interface to the SAP system
- COM/DCOM based interface
- TCP/IP based interface

In the event of failure of connection with the customer computer, the MMI of ITAS could be used for the functions of a customer's computer.

DATA ACQUISITION & CONTROL SYSTEM

DACS is responsible for the task of polling all the IEDs (Intelligent Electronic Devices, e.g. RTUs /PLCs /Batch Controllers etc.) installed in the field on one side and communicating to the main servers on the other. The DACS is OPC compliant and can support multiple protocol handlers simultaneously.

**Protocol handlers can interface with the following equipment :**

|		
PLCs	FCUs	Card Readers
Tank Gauging Systems	Electronic Display Boards	Weigh Scales
Additive Controllers	Flow Computers	Data Entry Terminals
Sealing Stations		

MAN MACHINE INTERFACE

Man Machine Interface, or the MMI is a multi-purpose GUI, which can perform a gamut of functions requiring user interface. In ITAS, the functionality of the Truck Entry System (TES), graphics displays for plant control etc., Bay officer interventions can be performed from any MMI, provided the logged in operator is the authorised.
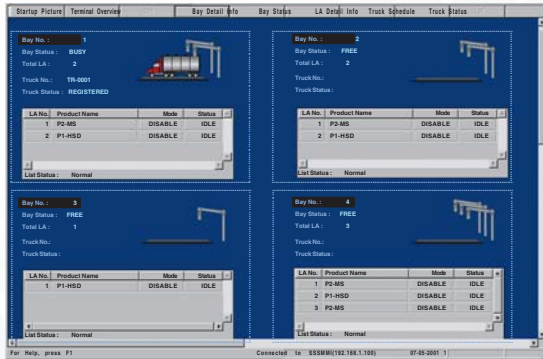
The MMI is designed as an independent module, which communicates with the Main Server using Client-Server architecture. It can run either on the same Main Server Machine or on a separate MMI client machine depending on the project size and the specification. The client-server architecture supports TCP/IP based connections as well as serial link connections through a modem or any other such devices on a **dual redundant LAN**.

The ITAS's MMI supports:

- Multiple MMI Client
- Multiple Windows per VDU
- Multiple VDUs
- Remote Man-Machine Interface
- Vector Based Graphics Objects (2D/3D objects)
- **32 bit** color palette
- **Double buffering** and **3D rendering**
- Smart Objects (SMOBs)
- Process Graphics Presentation
- Alarms and Events Presentation
- Presentation of data in Lists
- Reports Presentation
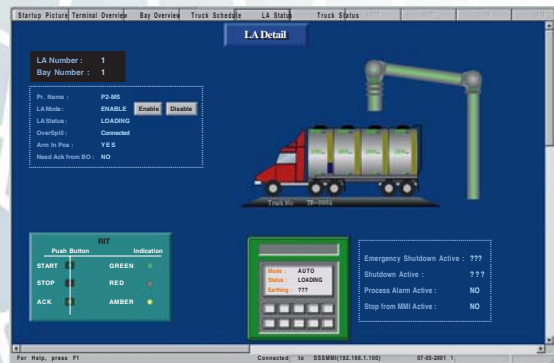
- Trends   1) Real-Time   2) Historical
- X-Y-Z Plots
- Animated Presentation of Data
- 2D/3D Standard Symbols Library
- Operator Commands and Data Entry
- Comprehensive Security Features

Reports

ITAS divides reports functionality into two types :

- Real-time Reports
- Historical Reports

ITAS Reports include :

- Bay Configuration
- Product Detail Configuration
- Truck Status Summary
- Truck Status Detail
- Compartment Status Summary
- Compartment Status Detail
- Bay Status Summary
- Bay Status Detail
- Product Loading Summary
- Product Loading Detail
- Product Receipt Summary
- Product Receipt Detail
- Tank Movement
- Tank Reconciliation
- Truck Movement

Truck Entry System

Truck Entry System (TES) is a function included in the ITAS MMI. Only authorized users are allowed to access TES functionality.

TES performs the following functions :

- Update of Customer's Truck Flags
- Truck Filling Abort
- Truck Filling Stop/Start (Stop/Resume)
- Update Of Bay's Current Status
- Update of Mode of Loading Arm
- Update Of Truck's Current Status
- Rescheduling
- Bay Reallocation & Reauthorization
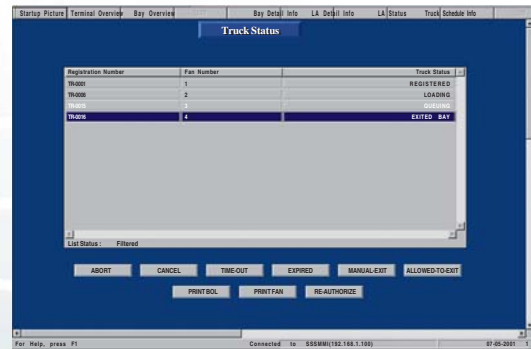
SYSTEM ENGINEERING

The engineering of ITAS system is divided into two major parts :

The Picture Editor of ITAS is a tool used to create process graphics related to various process operations. The picture editor allows the user to create graphical displays, which can accurately depict a process in terms of equipment layout and the data associated with it. Picture editor's powerful and easy-to-use user interface makes data engineering work **creative and efficient**. The picture editor of ITAS is developed using the **state-of-the-art technologies** like OpenGL, MFC, with the overall design based on the **object-oriented** approach.

Data Configuration Tool (DCT) which is used to configure most of the bulky data of the project, e.g., all the inputs/outputs, their acquisition and processing related configuration.

In order to facilitate easy configuration changes to the system, the Data Configuration Tool provides many configuration screens.

Some of the configuration screens are :

- Terminal Configuration
- Proximity Card Reader Configuration
- Bay Officer Card Configuration
- Bay Configuration
- Product Details Configuration Screen
- Tank related Configuration
- FCU Configuration
- Loading Arm Configuration
- Truck & Compartment Configuration
- Customer Details Configuration

System Performance

In any real-time system, performance is one of the main concerns. ITAS is designed to give performance of a real-time system. Performance has been built in right from the very basic building blocks of the product with specific attention to database, Inter-Process Communications, core libraries, and efficient use of computer resources. **ITAS also supports a truly fault tolerant system by supporting redundancy at all levels.** With interactive engineering tools and standard configuration templates, ITAS system engineering is extremely efficient. Use of industry standard concept of OPC Server and Client in the data acquisition and control system makes interfacing to third party devices and systems extremely flexible.

System Expansion

Technical obsolescence of computer hardware/software can cause problems with availability of spare parts and compatibility of existing software with new one. Also user might like to expand the system in future to include more equipments/functionality. Scalable and modular design of ITAS in hardware and software makes it easy and practical for a customer to upgrade and expand the system as and when required.

SYNERGY
SYSTEMS & SOLUTIONS

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