# ADVANCED SYSTEK

TERMINAL AUTOMATION SYSTEM

A terminal can be broadly defined as a storage area where petroleum and chemical products are received through pipelines, barges and rail wagons and stored in large tanks. These products are then transferred to trucks, wagons and ships to be transported to the end user, like a gas station / petrol pump.

We offer total Terminal Management solutions which includes design, engineering, supply, installation, commissioning & maintenance to our customers for efficiently managing and operating product distribution through trucks, rail cars, barges etc, while ensuring safety, security & accuracy. The terminal may be owned by single or multiple companies.
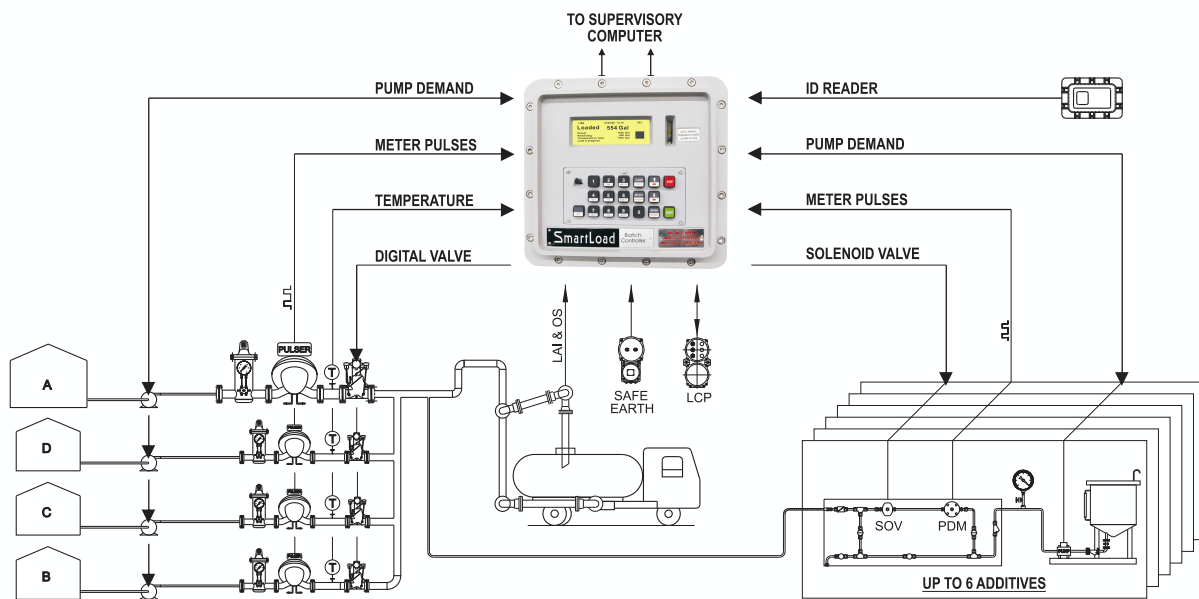
Truck / Rail Wagon Loading - Single Product / Multiple Blends & Additive Injection

A typical Terrminal Automation System consists of following components or sub-systems:

Preset (Batch Controller)
Batch Controller accurately dispenses batches of Products or Blends of up to 4 components by volume or mass and controls up to 6 additives. It updates supervisory software with the progress of the load and alarms. Batch Controller can be configured for In-line proportional or Sequential blending using flow meter, control valve etc.

Flow Metering
Consists of Positive Displacement or Turbine Meters or Coriolis Meters for Volumetric and/or Mass Measurement, Digital Control Valve (diaphragm / piston / pneumatic type), Strainer, Air Eliminator / Degasser and Safety Valve.

Additive Injection
The combination of Additive Block and Danload Preset ensures that the correct amount of additives are dispensed, eliminating need for Smart Injection Systems.

Safety Interlocks
Earth, Overspill and Arm Position detectors are connected to the Preset to ensure safe loading.

ID Reader
ID reader (Proximity, Touch types, Biometrics etc) is used for authorisation and access control. Some of them can be interfaced directly to Danload Preset providing security in the local operating mode.

Local Control Panel
Ex-proof panel consisting of indicating lamps and Push Buttons at each loading point to provide simplified driver interface.

Tank Farm Management
Tank Gauges, Temperature Sensors, Tank side indicators, Water Botton interface, Inlet and Outlet MOVs, CIUs and Tank Farm Software etc

Control Room Automation
Includes Redundant Supervisory Computers, Operator Interface Computers, Printers, PLC, UPS, Networking component, Smart Terminal Manager (STM) application software etc .

SmartLoad® - Field Mounted Batch Controller

- Explosion proof and Weather proof unit with 6 digit preset.
- 8x40 character graphics & multiple language LCD displays.
- Additive control, measurement, verification and accounting up to Six Additives
- In-line proportional / non-proportional or sequential blending, up to 4 components
- Up to 4 pulse meter inputs with dual pulse security to IP252 (ISO 6551) level B.
- Temperature / Pressure correction as per API.
- Digital batch flow control with outputs for set-stop or modulating control valves.
- Up to 24 digital inputs, 28 digital outputs
- Dual (redundant) serial data ports for communication
- CMRI / ATEX & CCE certified to Exd, IIB, T6 for use in Class 1, Div1 Area.
- Optional Sentry (Proximity ID Reader), Dantouch (Touch Key) Interface for local security.
- Single or Dual Arm Option available
- Approved by W&M Department & OIML R117 for custody transfer
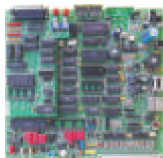
869S METER MICRO - Single-board, Safe area Batch Controller

- Input from flow meters with dual pulse security complying to IP252 Level A, RTD and Densitometer.
- Volume correction to 15°C to ASTM D1250-1980 or D1250-1952.
- Multi-stage flow control with outputs for set-stop or modulating control valves

869M IC Island Controller

- Controls 869S Meter Micros for one island (upto 2 bays)
- Compact panel mounted Microcomputer.
- Communication with up to six 869S Meter Micros
- Direct communication with upto two Mercury 2e IS Data entry terminals

SENTRY - Proximity ID Reader (Access Control Device)

- Used to read proximity cards
- Bi-colour LED for status indication and 2-DO/2-DI.
- Simple 4 wire connection; RS232/422/485 Communications
- Can be interfaced directly to Danload DL 6000 Batch Controller
- Available in Intrinsically Safe / Explosion proof version
- CMRI & CCE certified to Exia or Exd, IIB, T4 for use in Zone 0 Area

DANTOUCH -Touch Key ID Reader (Access Control Device)

- Senses ID number embedded in the Touch key.
- Highly immune to EMI, Mechanical stress and Dirt.
- Can be interfaced directly to Danload DL 6000.
- Available in Intrinsically Safe / Explosion proof version
- CMRI & CCE certified to Exia or Exd, IIB, T6 for use in Div 1 & 2 Area

MERCURY 2e TERMINAL - (Data Entry Terminal with Wiegend ID Reader)

- Used to read Wiegend cards.
- Graphic display mode supports non-latin alphabets.
- 30-way, alphanumeric membrane keyboard
- Interface supports RS232/422 and 485 serial communications.
- Intrinsically safe, weatherproof operator interface with 8x40 character LCD display
- CMRI & CCE certified to Exia, IIC, T4 for use in Zone 0 Area

ARM INTERLOCK (Safety Interlock Device)

• Arm Interlock ensures proper positioning of loading arm while loading.
• CMRI & CCE certified to Exia or Exd, IIB, T6 for use in Div 1 & 2 Area

OVERSPILL DEVICE (Safety Interlock Device)

• Overspill Sensor detects the level of liquid & prevents overspill while loading.
• CMRI & CCE certified to Exia or Exd, IIB, T6 for use in Div 1 & 2 Area

SAFE EARTH - Earthing Relay (Safety Interlock Device)

• Safe Earth continuously monitors that the vehicle is grounded.
• CMRI & CCE certified to Exia or Exd, IIB, T6 for use in Div 1 & 2 Area

869M QUANTUM Flow Computer

• Fiscal metering flow computer used for wide liquid metering or proving applications.
• Single / Dual Pulse inputs from Flow Meters are subject to error detection and correction to ISO 6551 /IP252, Level A or B standard.
• Calculation of flow to ASTM / API standards with temperature & pressure compensation

VS 300 - Pulse Transmitter

• Dual-output Pulse Transmitter for use with all reputed makes of PD meter like Liquid Controls, Smith, Brooks, Bopp & Reuther, Teltech etc.
• Dual pulse security checking to IP 252/76, (ISO 6551) level A. Also incorporates cable failure detection.
• CMRI and CCE certified to Exd.IIB.T6 for use in Zone 1 Area
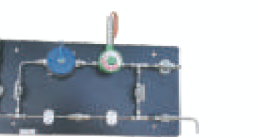
F106 - Turbine Meter Pre-Amplifier

• It raises small mV signals of the Turbine Flow Meter pick-up coils to a level which is adequate for transmission over several hundred meters.
• High gain, frequency compensated amplifier allows meter operation from 2 Hz. to 2 KHz
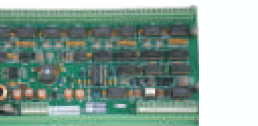
Additive Injection Panel

• Additive injector panel comprises of Oval type Meters with On-Off Valve, is designed to accurately dispense additives into petroleum products, when interfaced with Danload Batch Controllers on individual loading points in Gantry.
• Very Accurate compared to Piston Injectors or Smart Injectors

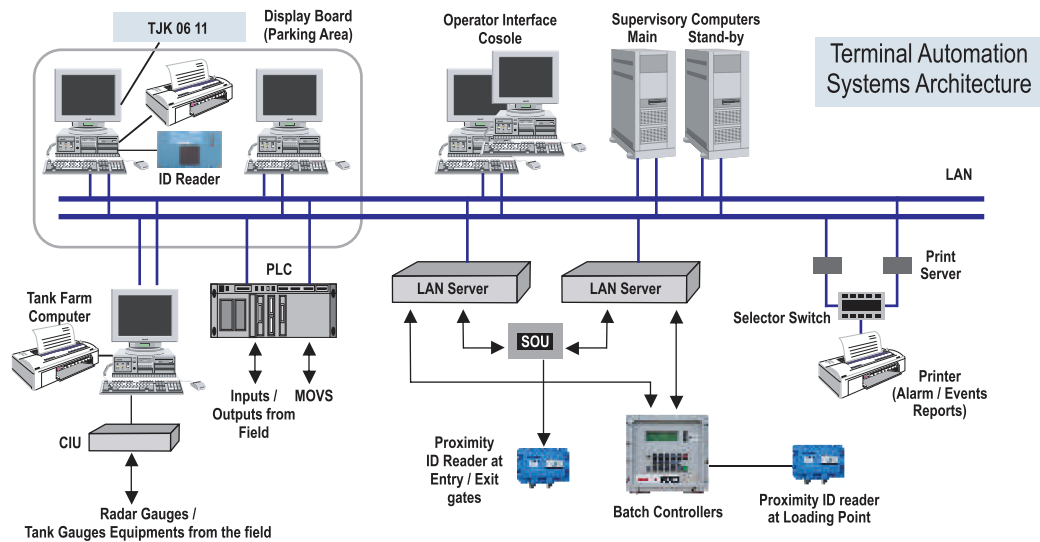### DCU Data Concentrator Unit - Serial line data multiplexer

• Allows eight devices to talk to a single shared device.
• It is ideal for driving a common printer or modem and for many other applications

FTX or SOU Module

• The FTX or SOU is a general purpose module designed to enable full duplex serial data
• It can accept Serial Input and provides two Serial Outputs for connectivity to dual network

ADVANCED ⬤ SYSTEK

Terminal Automation Systems Architecture

TJK 06 11 · Display Board (Parking Area) · Operator Interface Cosole · Supervisory Computers Main Stand-by · LAN · ID Reader · PLC · Print Server · Tank Farm Computer · LAN Server · LAN Server · Selector Switch · Inputs / Outputs from Field · MOVS · SOU · Printer (Alarm / Events Reports) · CIU · Proximity ID Reader at Entry / Exit gates · Batch Controllers · Proximity ID reader at Loading Point · Radar Gauges / Tank Gauges Equipments from the field

Benefits of Terminal Automation

Increased Efficiency
- Faster loading, higher throughput & greatly reduces work force
- Allows pre-scheduling of trips
- Documents and reports are generated automatically
- Inventory and accounting data available in timely and accurately to Host's accounting computers

Increased Flexibility

Changes in system configuration - Products, Tanks, Loading arms, Additives, Bays, MOVs, Pumps etc. can be quickly and easily added/deleted.

Increased Security & Accuracy
- Minimizes theft and fraud
- Secured Product loading
- Secured facility access
- Trip Advice Notes and Bills of Lading are generated automatically for the products actually loaded

Improved Environment
- Can manage vapour recovery units (VRUs) and minimize spillage by overfill protection.
- Compartment size checking ensures Cleaner and safer environment
- The system records data that helps satisfy the environmental reporting requirements frequently demanded by governments

Better Accountability
- Automated batch control, using high accuracy flow measurement and temperature compensation, minimizes and identifies losses
- Computer monitoring of product movement every significant event or transaction in the Terminal is recorded on a dedicated audit-trail printer and stored on disk for future reference.
- Provides for unauthorized flow accounting and detection with frequent reconciliations between loaded, metered and gauged volumes
- Allows co-mingling of stock and product translations

Increased Safety

Interlocks prevent loading from taking place under potentially dangerous conditions

Improved customer Service and Reliability
- Operates every hour of every day.
- Automated Blending and Additive injection allows customers to market new customized product variants

Improved Cash Flow

Improved inventory control allows stock optimization by reducing the time between order placement and delivery

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