

## Supervisory Control & Data Acquisition (SCADA)

DKI Terminal Automation Solutions make complete terminal automation possible through the effective integrated terminal operations from Host communication to bay I/O devices.

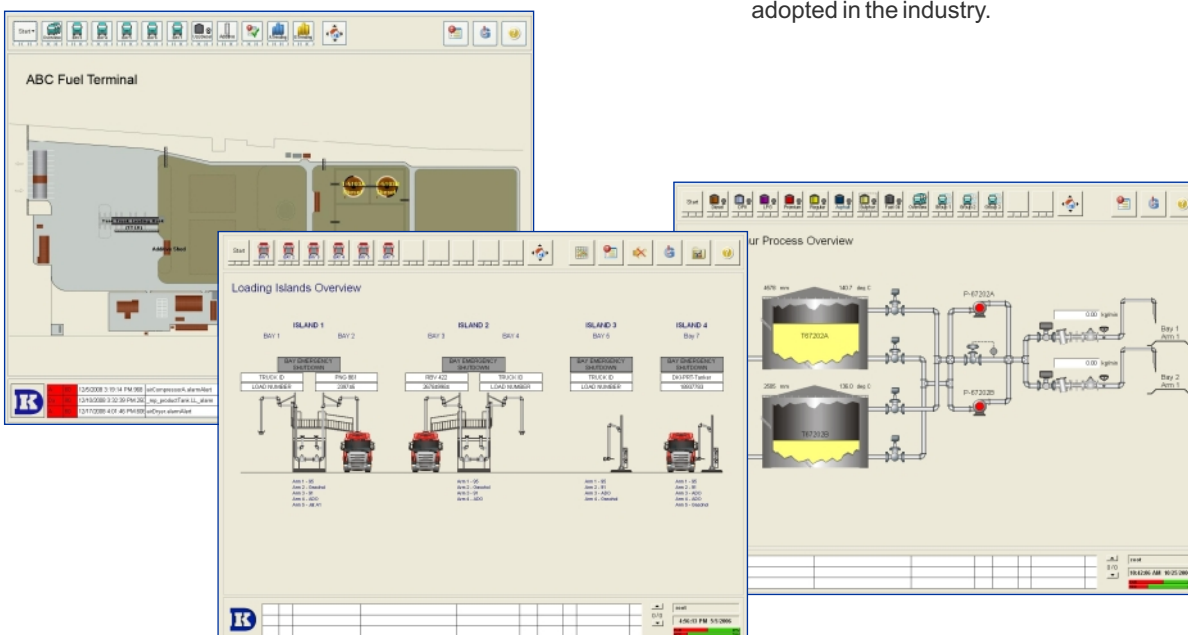
The DKI Terminal Automation System (TAS) Supervisory Control and Data Acquisition (SCADA) System monitors and allows the control of field instrumentation via a full graphical representation of site operation.

The TAS SCADA functionality provides a graphical Human Machine Interface (HMI) and will allow duly authorised operators to monitor and control, where applicable, the real-time aspects of the site. It interfaces directly to the Omega 3000 Terminal Automation System via an ODBC connection and the Site Programmable Logic controller (PLC) to provide an integrated view.

The functionality of the SCADA system varies from site to site but typically allows:

- graphical overview of site operations
- alarm management
- tanks monitoring and control
- valves monitoring and control
- pumps monitoring and control
- loading gantry monitoring
- external fire system status
- external multi-product pipeline interface
- various diagnostic screens

At any time the status of integrated site items can be viewed via the status summary screen(s). In this standard display, the status of each I/O point is shown both graphically and via text. In the case of analog values (e.g. tank level), real-time dynamic representation is used. In addition, the overall site status will be displayed on relevant colour graphics.



### Architecture

The DKI TAS SCADA system is made up of two distinct components: Server and Client Software.

The client-server architecture allows scaling of the system which is only limited by hardware capability. It can be scaled from simple small single-sites to distributed, redundant, multi-site systems.

TAS SCADA server software is a real-time software environment which is the core of the system. It operates 24 x 7 x 365 regardless of how many client sessions are active. In fact, the server software runs even if there are no client sessions active at all.

The Client Software is responsible for all graphical display functions to the user and is constantly updated from the Server. Client screens provide all the graphical interface functions that allow you to view what is happening on the server or to manipulate server functions.

### Interfaces

#### Omega

Omega is fully integrated with DKI SCADA for a fully integrated solution. For example, when an operator changes the current working tanks in Omega, the respective pipe-work database set in Omega and DKI SCADA are automatically adjusted. The Omega TAS administrator changes the operational tanks that subsequently cause updates to the pipework configuration databases. This ensures correct accounting of all product movements drawn from the tanks. In addition, the Bay Loading Controller configuration is updated with the new product and density values to ensure correct temperature compensation values are used in the product delivered volumes.

#### PLC

The TAS SCADA system is an open system architecture and supports multiple communication protocols such as Modbus, Profibus, DeviceNet, Interbus and others that are widely adopted in the industry.

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## Tank Gauging System

Most of the tank gauging systems support standard protocols which are a fundamental part of the SCADA system. Other interfaces are handled with specific drivers.

## Screen Graphics

**Site Overview** is the main graphic, which shows the site layout and approximate locations for site items. This screen is constructed for the individual site and includes sub components such as; Truck Loading Gantry, Tank Groups by Product, Drum Filling Area, Pump Back Area, Additives, Pumps and Inlet Metering System. Sub-screens are accessed by clicking on an area the operator wishes to view.

**Tank** graphics display the level details and any alarms.

**Truck Loading Gantry** summarises information for loading bays on the site, including bays which have active transactions, arms that are currently loading and the basic status of each bay.

**Truck Loading Bay** shows Bay Status, Truck ID, Driver Name and transaction details for each arm.

**Products** - Each product has a screen showing the inlet pipe-work, tanks, outlet pipe-work and pumps, these provide a summary status of the entire hydraulic system for that product. It is then possible to click on a site item to view specific details including valves, pumps and tanks.

**ESD** graphic will monitor all ESD areas that are connected to the system.

**Pipeline Imports/Exports** are monitored by displaying flow rates, temperatures and pressures of each import meter subsystem.

**Vapour Recovery/Drum Fill** status is monitored and displayed.

**Diagnostic** screens display PLC I/O status and other relevant data useful for understanding the site.

**External Fire System** if required (may be monitored and integrated into the SCADA).

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