MEGA

Industrial Control Systems

Flashtech®

Terminal Automation System

Industrial Control Systems

Mega Industries is a Research & Design-driven company that combines state of the art engineering and software technology development with products from the world's best manufacturers supplying the oil and gas industry to create best-in-class solutions for refinery and petroleum terminal operations.

From the Founders…

When we established Mega Industries many years ago, we had a clear mission: to design, develop and deploy end-to-end monitoring and control systems developed specifically for the refining and petroleum storage industries and designed for every stage of their business processes.

After decades spent at the world's leading multinationals, we were thoroughly familiar with the limitations and flaws of the systems available. We resolved to seize the opportunity to show the world what Turkish engineering and Turkish software technology could achieve. The result is Flashtech®, which is a groundbreaking MIS (Management Information Systems) application but also much more than just a computer suite.

While we were developing Flashtech®, we shared our vision with leading international manufacturers like FMC Technologies, Auma, Honeywell-Enraf and more. They were impressed by the comprehensiveness of our solution and excited by the opportunities it presented. The result is that, in cooperation with them, we have created a system that combines state-of-the-art software systems and the most advanced products for fluid management, measurement, loading, unloading, blending, additive injection and more.

As the official Turkish distributor for these companies, we provide value-added project design, engineering, installation and maintenance services, whether they are integrated with Flashtech®, as is the case at some of the regions leading terminals, or employed in a range of industries from natural gas and water to textiles, cement, foodstuffs and more.

We invite you to take this chance to discover Flashtech® and the reasons that top petroleum companies have chosen the system, including cost-savings, improved management visibility and direct positive impact on Health Safety Security Environment (HSSE).

Sincerely,

Mega Industries Control Systems

Mega Industries is committed to putting the power of softwaring at the center of operational control, using technology to integrate components into a whole that is more effective than any of its parts and that functions as a single unit for creating visibility, minimizing risk and maximizing profitability.

Combining Cutting-edge Technology and Components to Improve Customer Competitiveness

Mega Industries is a dynamic and fast-growing company whose founders have decades of firsthand experience in petroleum sector engineering. The company serves refiners and petroleum storage terminals, specializing in management, measurement and control of tank truck loading, vessel loading and pipeline operations. Its solutions are suitable for the full range of petroleum and gas products, including LPG, gasoline, diesel, aviation fuel, fuel oil, blended products and lubricants, at facilities of any size from mammoth refineries to small-scale loading plants, giving Mega a unique competitive advantage as it seeks to market its best-in-class solution and expand its operations beyond its home region.

Since its founding in 1997, Mega Industries has grown from a start-up with a vision of a better way to monitor and manage mission-critical operations at refineries and petroleum storage terminals to become an industry leader in a region encompassing Turkey, Eastern Europe and the Caucasus. Mega Industries' leadership is technology-driven, reflecting the company's excellence in software engineering as well as its expertise in integrating digital and mechanical systems to provide superior control environments.

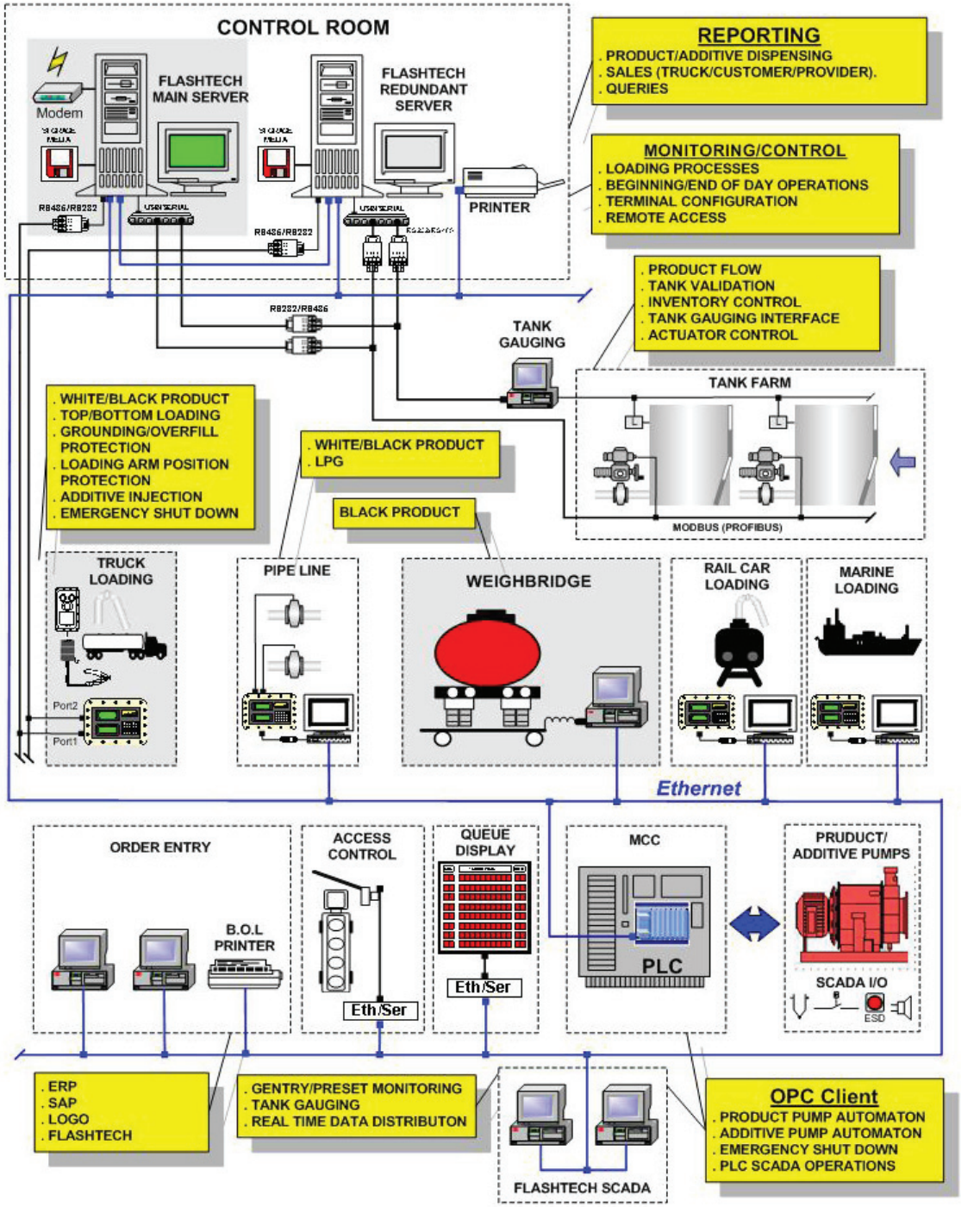
Today, the company, with its team of over a dozen highly qualified engineers, backed by a staff of technical and support personnel, has expanded beyond its home region. Mega Industries is confident of its ability to compete in the world's most sophisticated markets, because its Turkish-designed technology combines cutting-edge systems and programming with an intimate, firsthand knowledge of the special needs of the petroleum industry, a challenging environment where every system is mission critical and potential losses are expressed not only in millions of dollars but also in human lives. The Flashtech® system's key advantage is its ability both to prevent those losses and to ensure profitable operations.

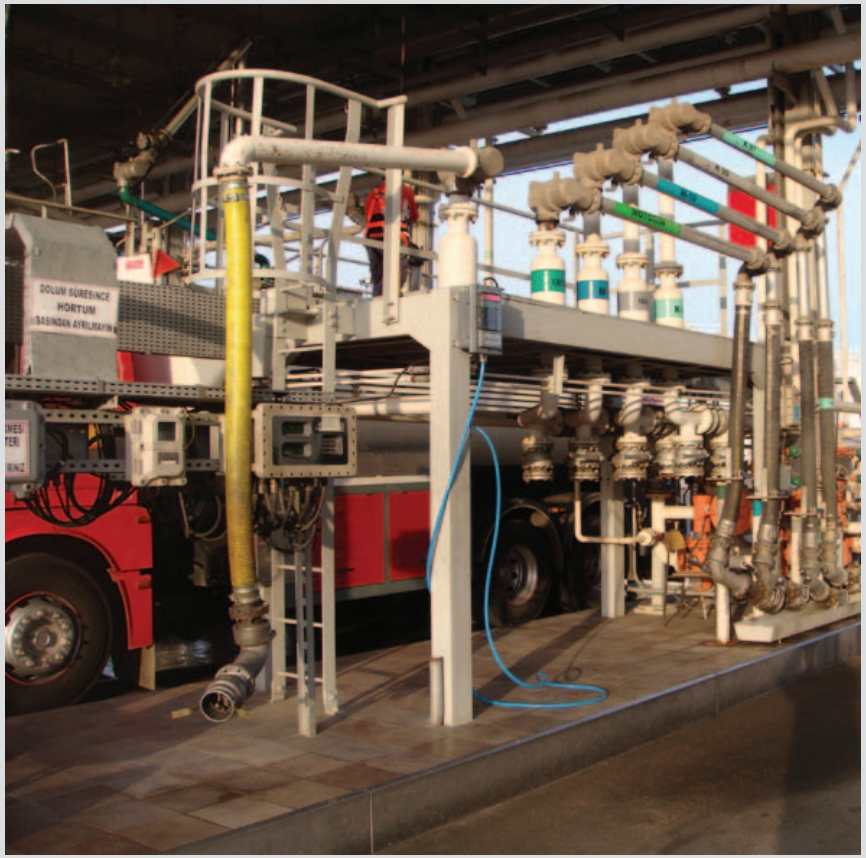
Flashtech®

Terminal Automation System

Flashtech® Terminal Automation System

Flashtech® is a Terminal Automation Package that controls the flow of information from the loading area to the corporate order/business systems, specifically designed for loading terminals, refineries and petro-chemical plants.





Truck loading and unloading

Barge loading

Weighbridge interface

Rail car loading

Flashtech® insures

- Security and supervision of the loads
- Identification and tracing of orders-trucks-drivers
- Control and monitoring of loading process conform to corporate business rules
- Management of orders, product movements, inventory
- Creation of reports,documents and certificates
- Enterprise level of integration

Flashtech® supports the following load rack equipment as standard

Preset Controllers
Smith Accuload II STD, SEQ, STM, Accuload III, Microload

Additive Injection Support
Metered injector mode (Smith Accuload III.& Microload)
Enraf Minipak 6 smart injector
Enraf Minipak 2000/3000 preset/automation controlled smart injector
Fusion 4

Rack Blending/Tank Blending
Enraf Microblender
Accuload II SEQ, Accuload III Sequential and Ratio Blender
Fusion 4

Order Management

Stand-alone order management

- Clerk entered orders
- Loading Advice Note
- Order status updates
- Bill-Of-Lading

ERP Host interface

- Database Replication (ORACLE and SQL)
- SAP interface through Remote Function Call

Bulk Storage

Tank storage

- Product definition
- Strap tables
- Volume corrections
- Tank operations
- Product movements through manual entry or through tank gauging

Inventory management

- Tracking of physical tank inventories
- Tracking of book inventories
- Physical versus book inventory reconciliation
- Tank-to-tank transfers
- Bulk receipts
- Product gain/losses

Flashtech® SCADA

OPC Client Interface to

PLC, SCADA and DCS systems
Emergency shut down systems
Fire and gas systems
Tank Gauging systems

MODBUS RTU interface to

Tank Gauging systems
Queue Displays
Load rack automation system interface
Monitoring & Control
Event/Alarm management

System Configuration

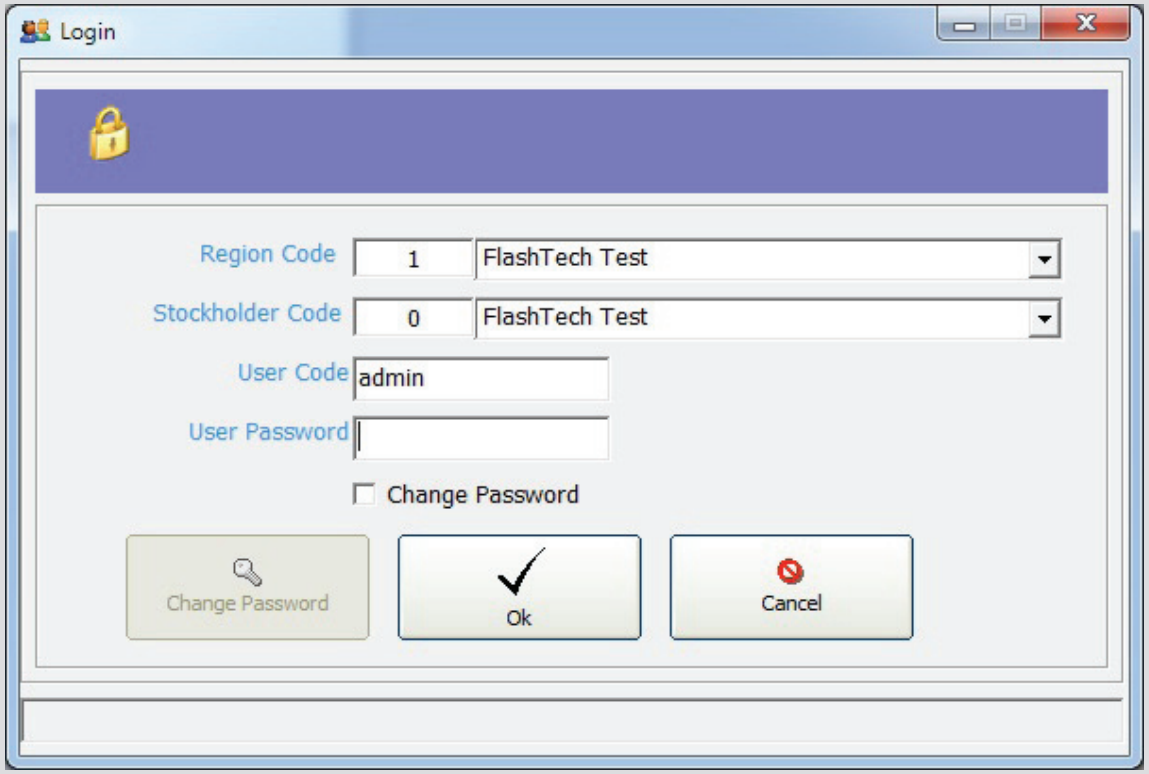
Flashtech® is freely configured to suit the requirements of a loading terminal.

System Builder

Terminal
Stock holders
Users
Tanks
Customers
Entry/Exit gates
Loading racks
Presets
Products
Carriers
Vehicles
Drivers
Site Security Options
Servers
Clients
Port Drivers
Remote Access Settings
Default Parameter Settings

SCADA Builder

OPC server
OPC items
Equation blocks
Page displays
Objects
Custom Reports
Documents
Certificates

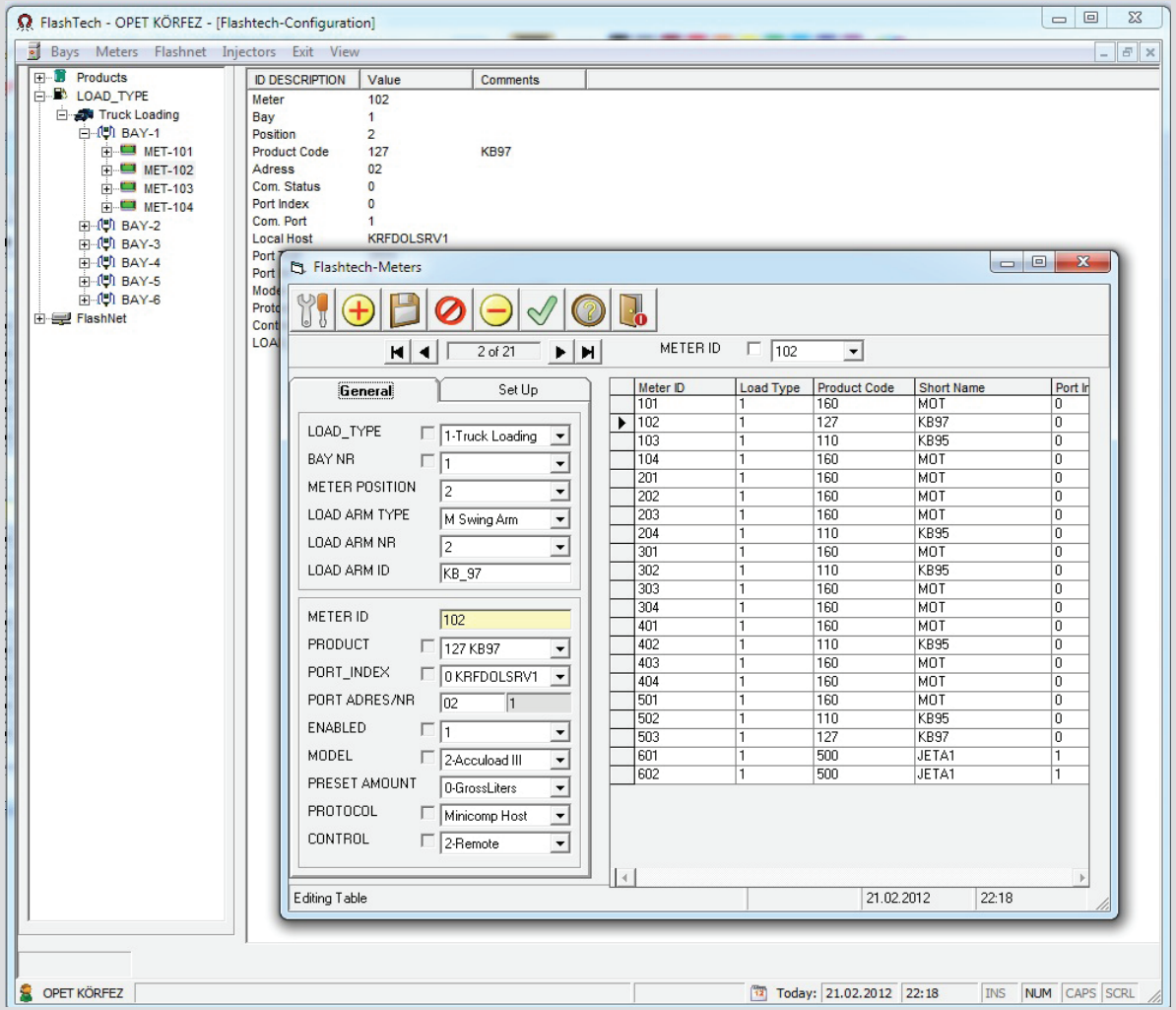


Terminal Operations

The next page will be formatted based on the user access level.

Only Menues, Pages and Commands accessible for a particular security level will be made visible to the active user.

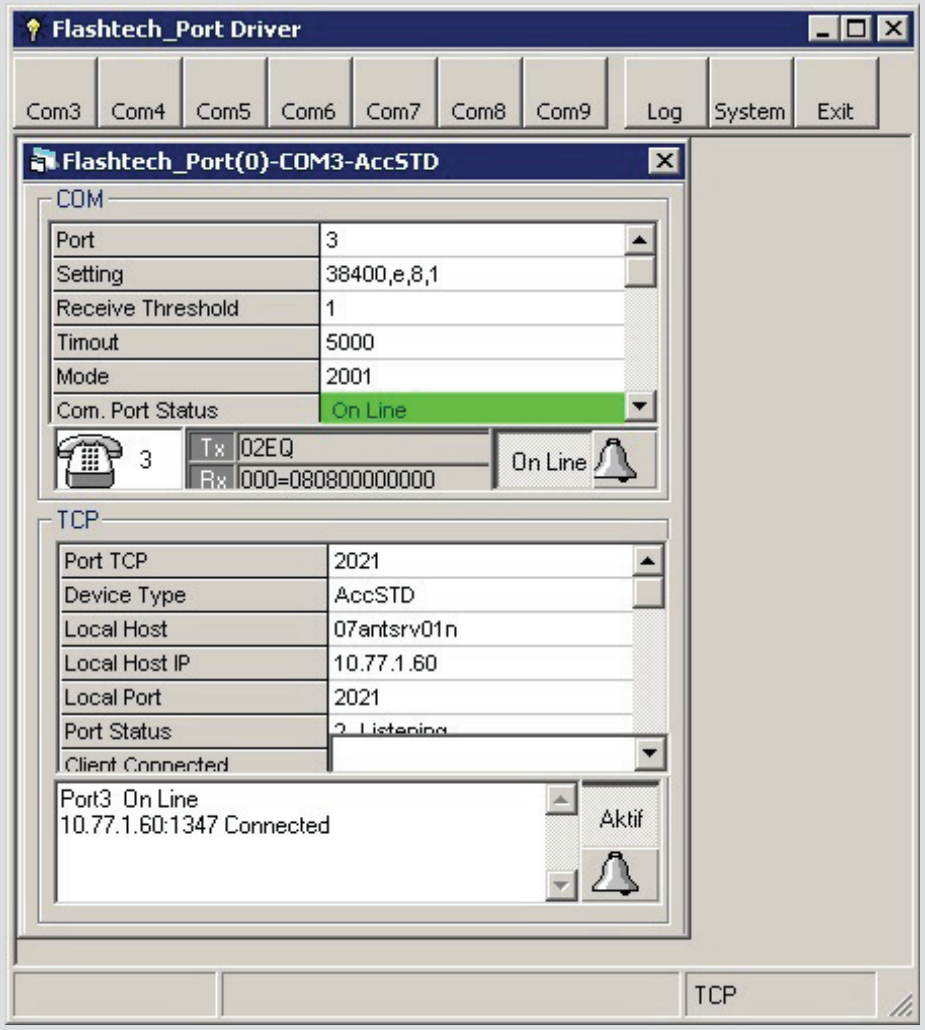
Passwords for each user can be forced to be updated periodically by the administrator for increased security.



System Configuration

FLASHTECH® is developed as a true Client Server architecture to transfer data across Wide Area Network as well as Local Area Network.

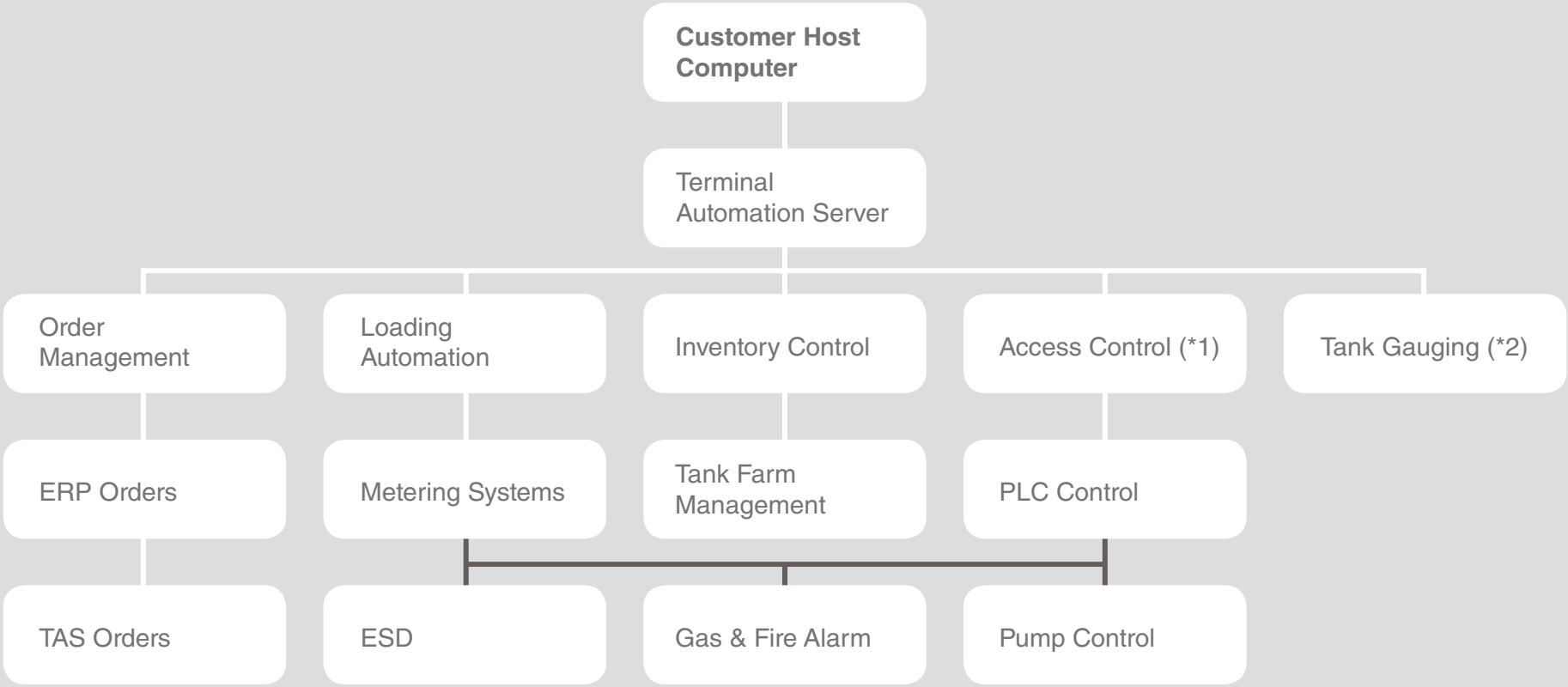
FLASH_NET components are PC servers and clients where the application programs are installed based on the topology and the user profile of a terminal.



Communication capabilities

Electronic preset controllers
Smart injection controllers and blenders
Queue Displays
Tank Gauging systems
Weighbridge
PLC systems

FLASHTECH® uses network based port drivers to access devices in the most efficent and reliable way, greately reducing the cable cost in large installations.



Notes:
(*1): Option
(*2): Supplied by others

System Operation

Terminal Automation System

Tank Truck Arrival

- Tank Trucks arrives at the Terminal
- Reports at the Sales & Distribution Office

ERP Orders

Load Creation On Host

- The SAP operator checks that the tank truck is registered in the system.
- Commercial details are verified.
- Order is created by the host system operator. The driver is given the filling Advise Note and/or a security card.
- TAS listener automatically uploads the new order through ORACLE replication.
- Now the order is accessible to the authorized user in all client machines where the TAS client component is installed.

TEST TERMINAL
LOADING ADVICE NOTE

Vehicle ID	**34VY816**
Customer	**100139 Test Customer**
ERP Order No	
Cargo Nr	796
Queue Nr	20
Entered	18.01.2012 08:55:00
Driver Name	BAHR?BATMAZ SRC 4 (143)

No	Product ID	Product Name	GRS Trans.	Weight Kg	Barcode
1	203	MOTORIN EXCELLIUM EURODIZEL	**7.000**	5.795	**70.282.901**
2	266	MOTORIN %2 BIODIZEL	**2.000**	1.656	**70.282.902**
3	203	MOTORIN EXCELLIUM EURODIZEL	**5.000**	4.139	**70.282.903**
4	266	MOTORIN %2 BIODIZEL	**6.000**	4.967	**70.282.904**
5	215	KB 95 OKTAN (BIOETANOL)	**6.000**	4.394	**70.282.905**
6	266	MOTORIN %2 BIODIZEL	**7.000**	5.795	**70.282.906**
Total			**33.000**	26.746	

Truck Data	
Truck Licence	
Inspection Date	04.02.2009
Next Inspection	04.02.2009
Weight Limit	27.000
1	**7.000**
2	**3.200**
3	**3.200**
4	**5.000**
5	**6.500**
6	**6.100**
7	**7.000**
Total	**38.000**

Site-Operator

Driver Singature

Filling Advice Note

The FAN for the new order has been printed.
The driver will now proceed to the loading rack.

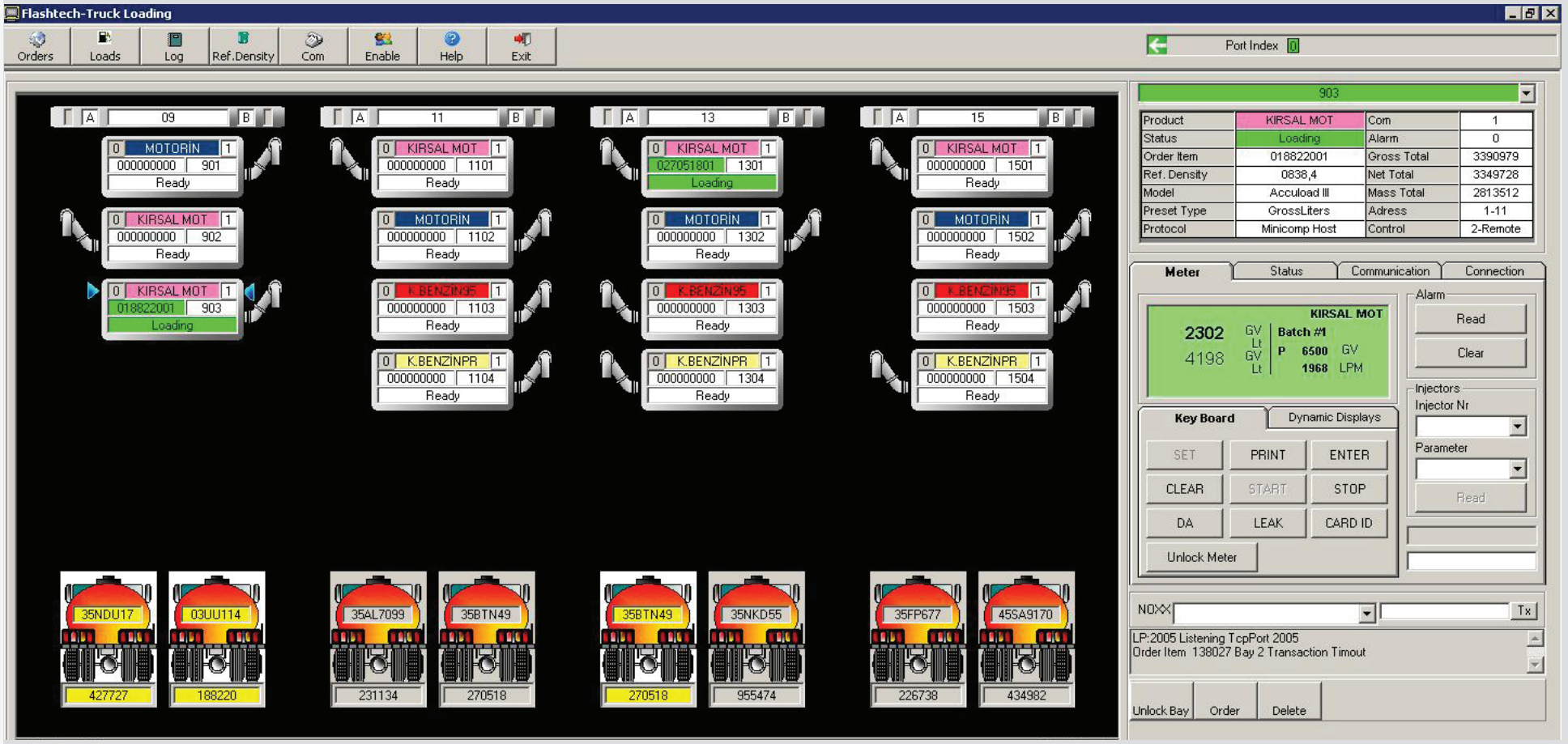
Terminal Automation System

Top Loading Bay Operation

- Driver connects the Earth
- Inserts the loading arm into the compartment
- Enters the PIN code
- Upon successful validation of the PIN code the preset is automatically set to the total order quantity for the product to be loaded
- Starts loading
- The same steps are repeated in sequence for each product to be loaded
- When all the products have been loaded up to the specified limits, disconnects the earth connection and leaves the bay

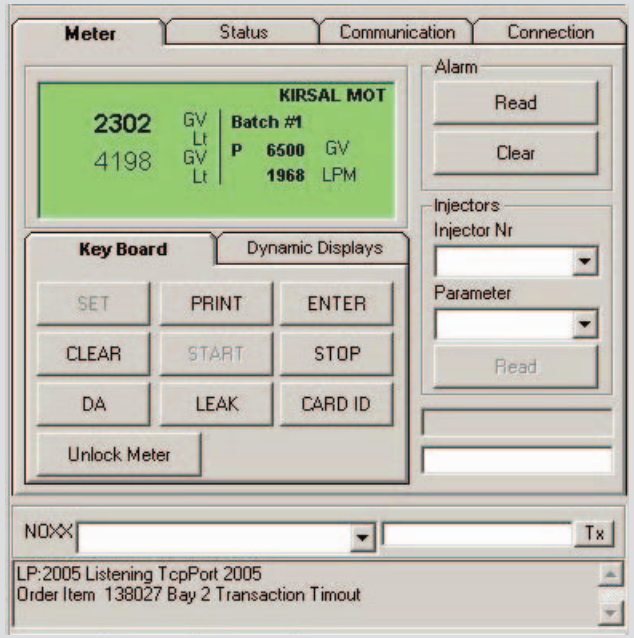
Bottom Loading Bay Operation

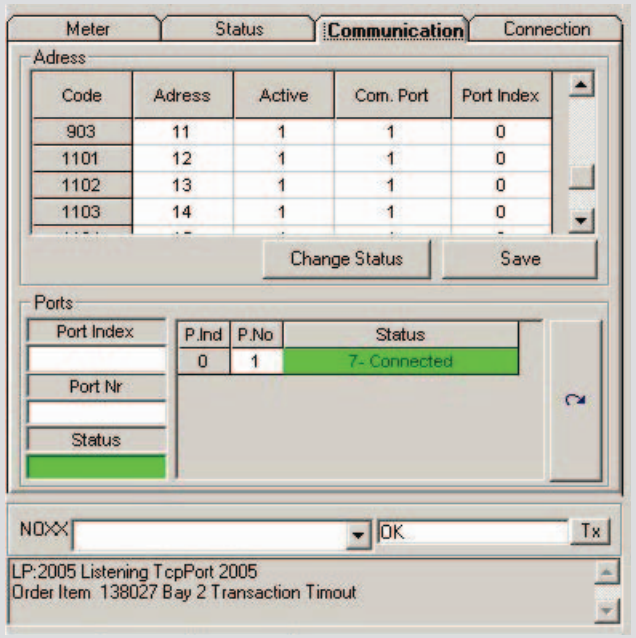
- Driver connects the Earth
- Inserts one or more loading arms into the compartments
- Selects the first loading arm on the preset
- Enters the PIN code and the compartment number for the first product to be loaded
- Upon successful validation of the PIN code and the compartment number the preset is automatically set to the quantity of product to be loaded into the compartment
- Starts loading
- On all subsequent compartments the driver is prompted for compartment numbers only
- When all the products have been loaded up to the specified limits, disconnects the earth connection and leaves the bay

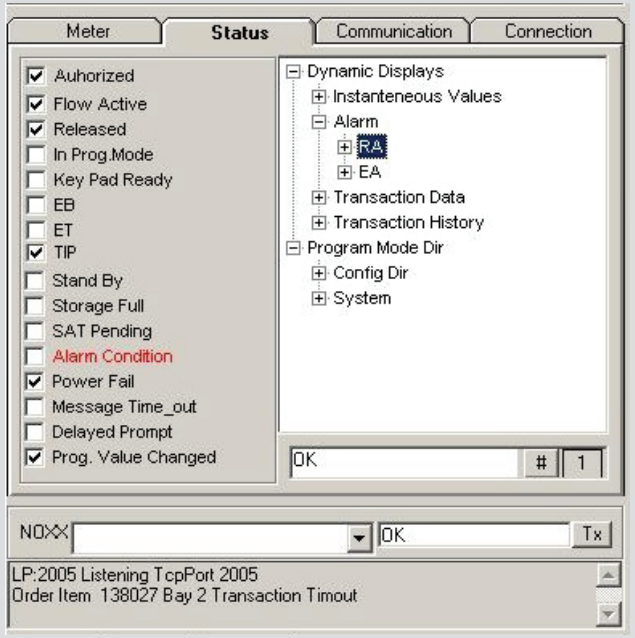


The operator interface allows:

-Monitoring and control of the selected meter position
-Monitoring of device event/alarm status
-Tracing of orders/vehicles for order status and meter status updates

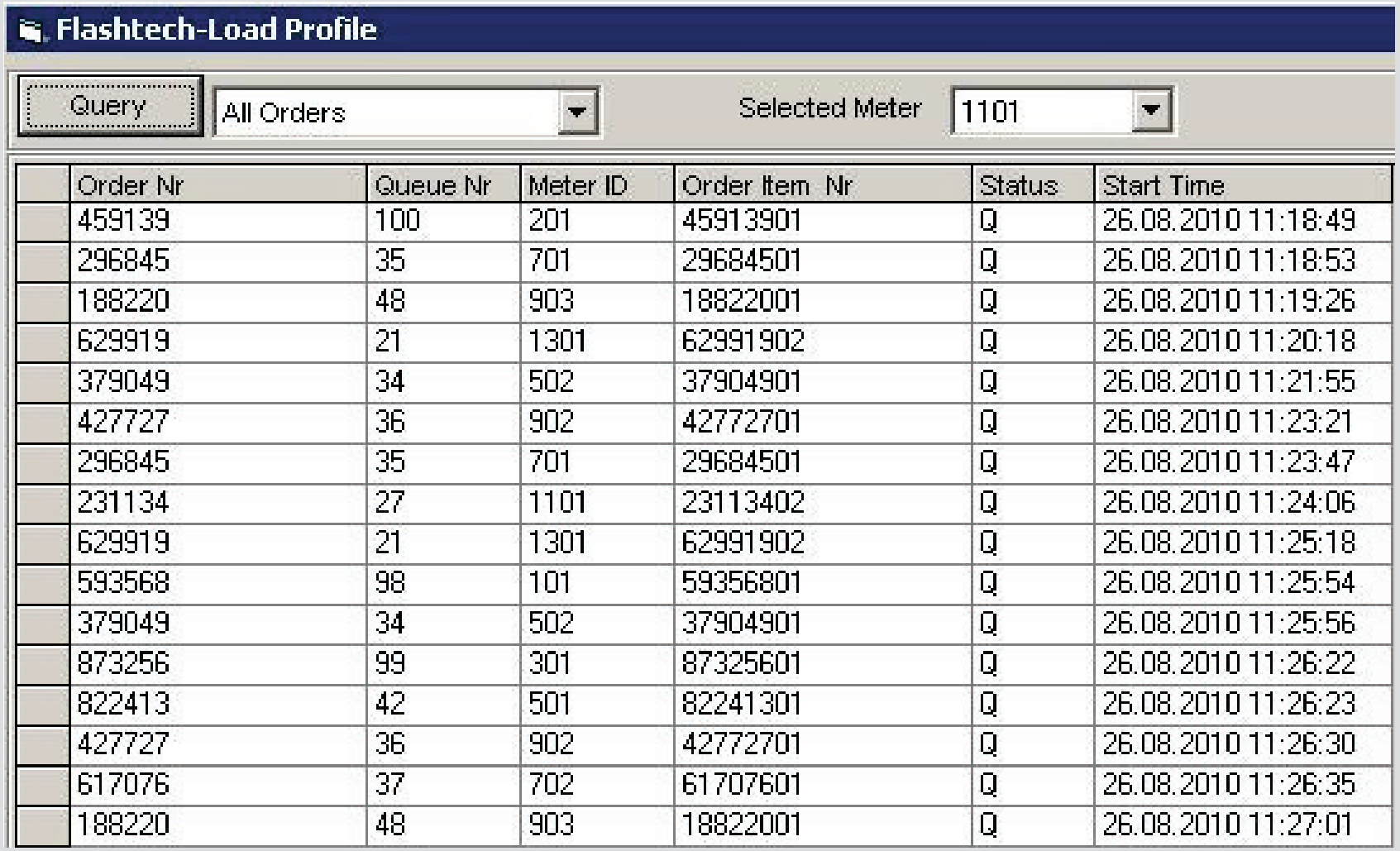






Operator Interface Meter Control Panel

Selected meter position is monitored and controlled.
Detailed information can be retreived through a tree view structure.



Order Nr	Queue Nr	Meter ID	Order Item Nr	Status	Start Time
459139	100	201	45913901	Q	26.08.2010 11:18:49
296845	35	701	29684501	Q	26.08.2010 11:18:53
188220	48	903	18822001	Q	26.08.2010 11:19:26
629919	21	1301	62991902	Q	26.08.2010 11:20:18
379049	34	502	37904901	Q	26.08.2010 11:21:55
427727	36	902	42772701	Q	26.08.2010 11:23:21
296845	35	701	29684501	Q	26.08.2010 11:23:47
231134	27	1101	23113402	Q	26.08.2010 11:24:06
629919	21	1301	62991902	Q	26.08.2010 11:25:18
593568	98	101	59356801	Q	26.08.2010 11:25:54
379049	34	502	37904901	Q	26.08.2010 11:25:56
873256	99	301	87325601	Q	26.08.2010 11:26:22
822413	42	501	82241301	Q	26.08.2010 11:26:23
427727	36	902	42772701	Q	26.08.2010 11:26:30
617076	37	702	61707601	Q	26.08.2010 11:26:35
188220	48	903	18822001	Q	26.08.2010 11:27:01

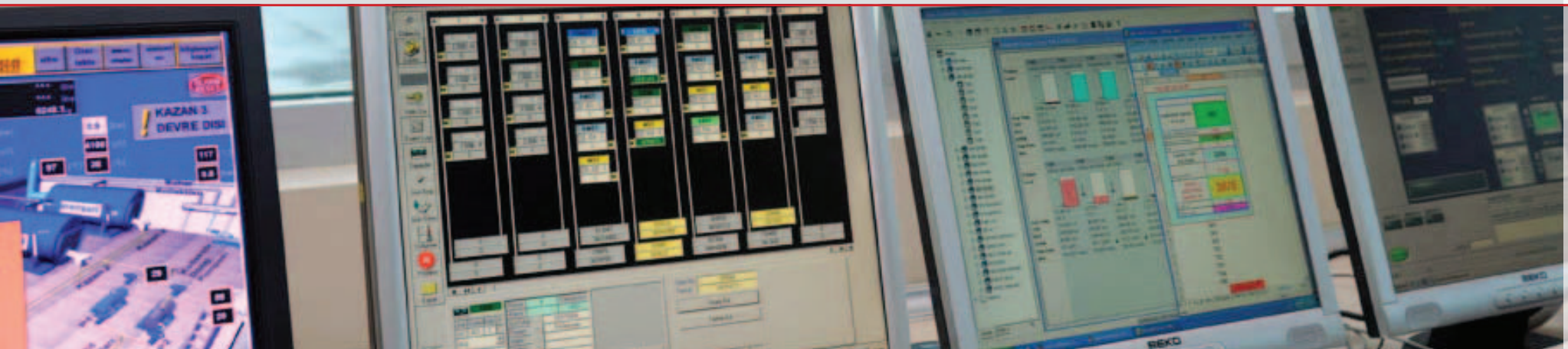
Operator Interface-Load Profile

Load profile can be sorted any time during the operation through an elaborate filter criteria without a need to know how to build complex SQL statements.

Terminal Automation System Loading Completion

When all products are loaded up to the specified limits TAS automatically terminates the order and releases the bay.

The driver can now exit the loading area to collect his Bill of Loading Document alternatively at the exit gate or at Sales & Distribution.



TEST TERMINAL

BILL OF LADING

Customer Code	128715
Name	AKT TEST CUSTOMER
Queue Nr	22
Date	18.01.2012
Vehicle ID	34ZL1867
Driver Name	ÖMER BAYTOK SRC 3
Loading Start-Finish	18.01.2012 09:10:00 - 18.01.2012 09:23:00

No	Product Name	Amount Lt	Ref. Density	Amount Kg	Temp (°C)	S.Nr	Meter Nr.	Tank Nr.	Hour	Init. Totals Final Totals	GRS Trans.	GST Trans	Cmp
1	11.864.001	6.847	0,8279	5.669	7,1	1	302	16	09:10	77.150.501	6.801	6.847	2
	203 MOTORIN EXCELLIUM								09:15	77.157.349			
2	11.864.002	12.589	0,8279	10.422	6,8	1	302	16	09:16	77.157.349	12.500	12.589	3
	266 MOTORIN %2								09:23	77.169.937			

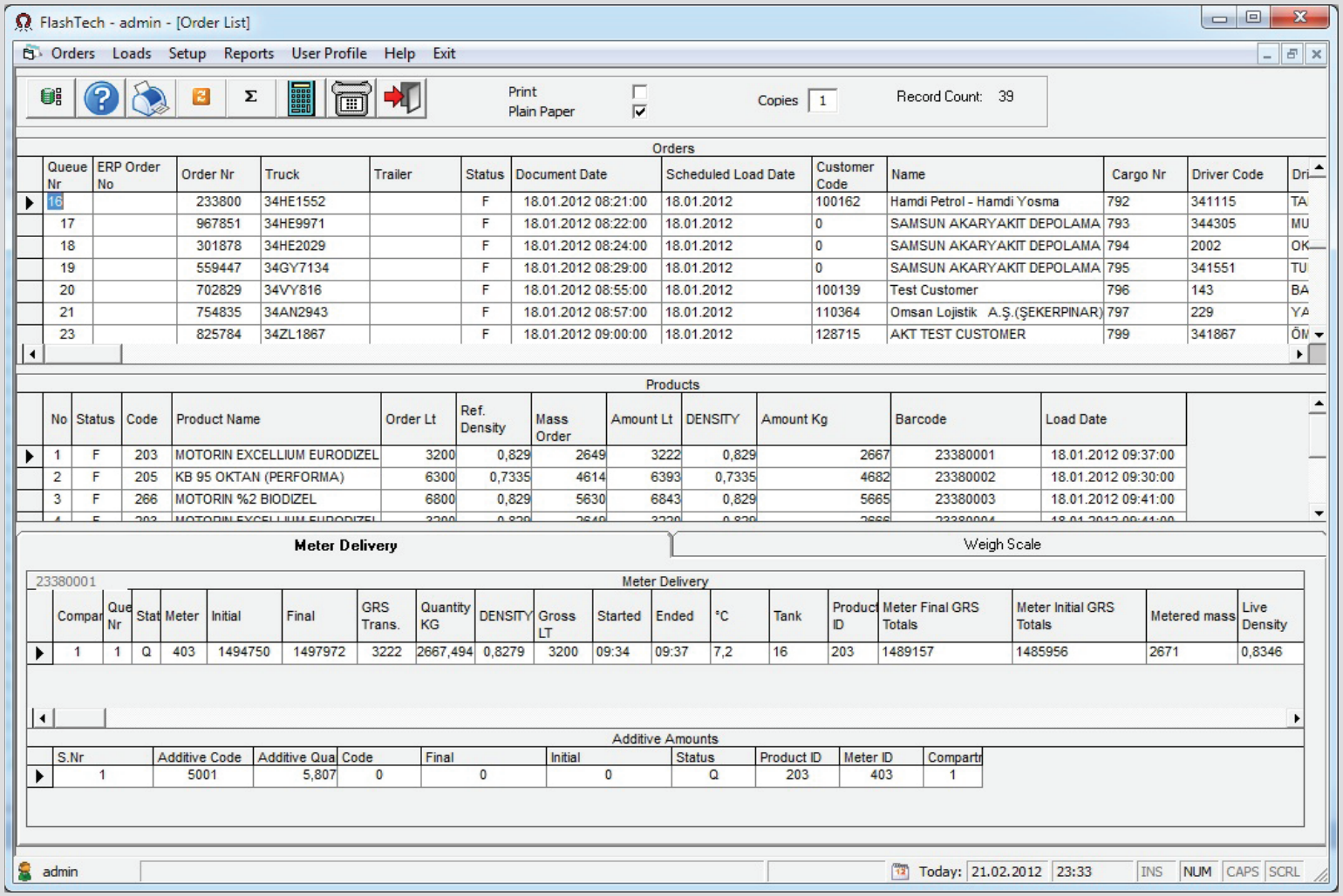
PRODUCT TOTALS:

Product	GRS Trans.	GST Trans @15	Mass	DENSITY @15	Temp (°C)
MOTORIN EXCELLIUM EURODIZEL	6.801	**6.847**	5.669	0,8279	7,10
MOTORIN %2 BIODIZEL	12.500	**12.589**	10.422	0,8279	6,80

Product Delivery Note

-Product delivery note or Bill Of Lading is printed.
-Driver can collect his invoice if required.
-Cards/Barcod Readers can be used to select the trucks.
-The driver arrived at the exit gate to collect his Product Delivery Note.

Terminal Automation System
Data Transfer to Host



Order List

1. Orders are uniquely defined by Order Numbers
2. An order is associated with Order Items that refer to the products to load for a single or multiple clients.
3. FLASHTECH® enables products of an order to be metered and/or weighed. This applies to both white and black products
4. The operator interface offers an extensive set of search options for trouble shooting and for retreival of historical data
5. The authorised users are allowed to perform meter status updates

Reporting

- General Reports (End-of-Day)
  - *Meter Delivery*
  - *Meter Totals*
  - *Product Dispensing*
  - *Loads by customer*
  - *Weigh Scale Loading*
  - *Additives*
  - *Number of Loads*
- End-of-Day closeout
- End-of-Month closeout
- Load Report by product
- Load Report by Preset
- Load Report by customer
  - *Loads*
  - *Additive*
- Load Report by stockholders
  - *Bookings*
  - *Loads*
  - *Additives*
- Weighbridge versus meter cross checking
- Dynamic stock tracking
- Tank versus meters reconciliation
- Physical-to-book inventory reconciliation
- Meter Totals
- Additive Totals
- Truck Product movement
- Tank Booking Report
- Product Movement Tracking

Flashtech® supports standard and custom reports in a variety of formats.

Tank Provers of varying sizes for 4” Volumetric Meters

Bidirectional Ball Provers

Proving

- Flashtech® provides an extensive set of automatic proving utilities for proving custody transfer meters used in Truck Loading, Rail Car, and Pipeline.
- Flashtech® utilizes the API latest algorithms for calculating volume correction factors
- Flashtech® monitors meter performances by comparing current meter factor to previous meter factors
- Flashtech® offers a comprehensive set of built in queries for sorting detailed information pertaining to a meter, equipment, and individual proving’s.
- Flashtech® provides immediate access to historical and trending date
- Flashtech® supports standard and custom reports in a variety of formats

Pay & Check System

In custody transfer pipelines, the performance of the fiscal meter needs to be monitored using a second meter.
These pay and check meters need to be calibrated using an in-line proving system.
We use Bidirectional Provers for in-line proving of volumetric meters such as Ultrasonic Meter, PD Meter and Turbine Meter.

Aviation Refueling

Terminal Automation System Order Processing

SAP Host Interface
SAP transactions managed by the interface
Truck Loading/Unloading
Rail Car Loading/Unloading
Pipeline Custody Transfer
Weighbridge Automation
Aviation Refueling & Logistics

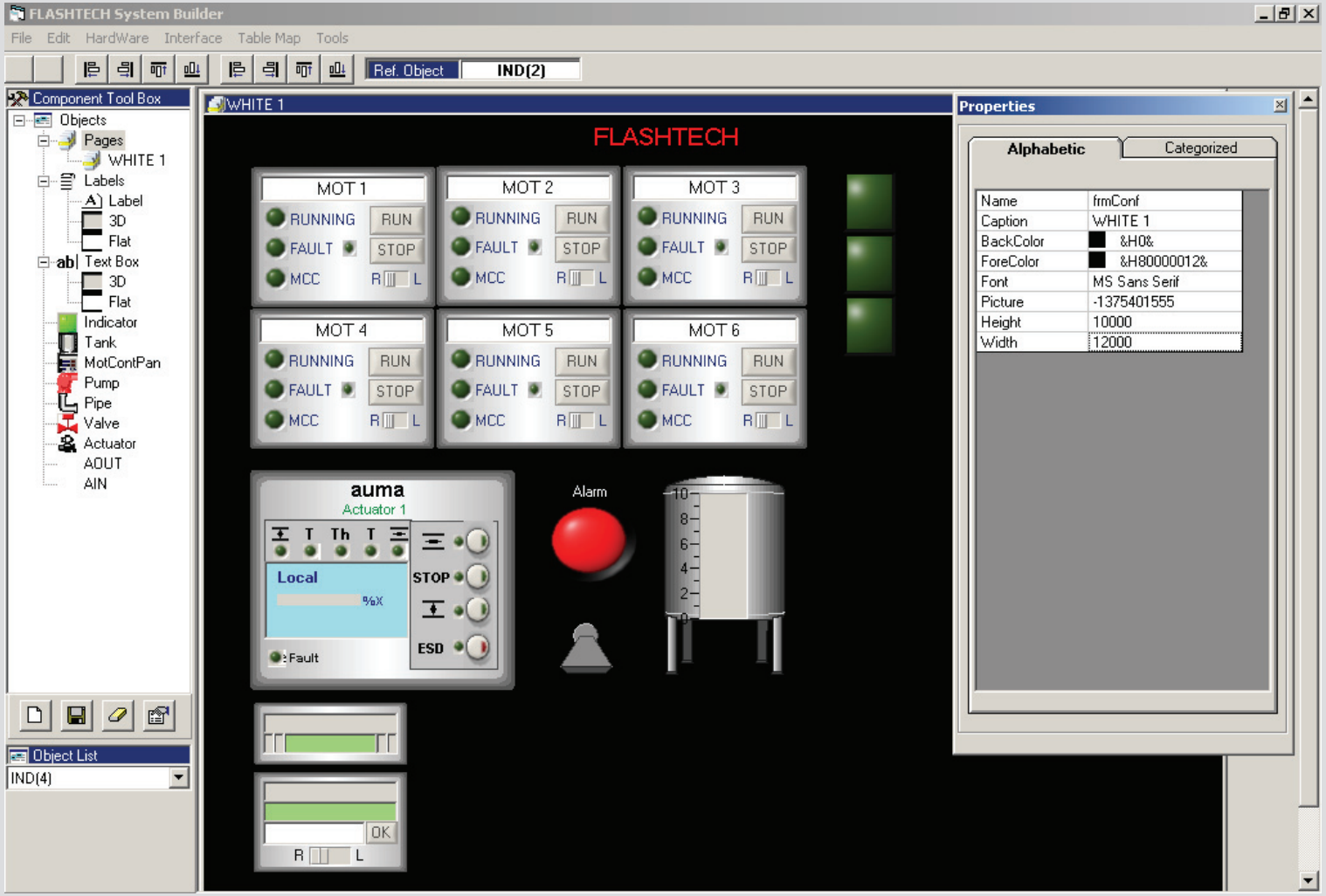
SAP Installations
An RFC based custom Interface is being effectively used as standard in all custody transfer operations in following enterprises:

TÜPRAS Refineries (4 Refineries)
OPET (6 Terminals)
Lukoil (6 Terminals)
THY-OPET (6 Airports)

Flashtech® SCADA

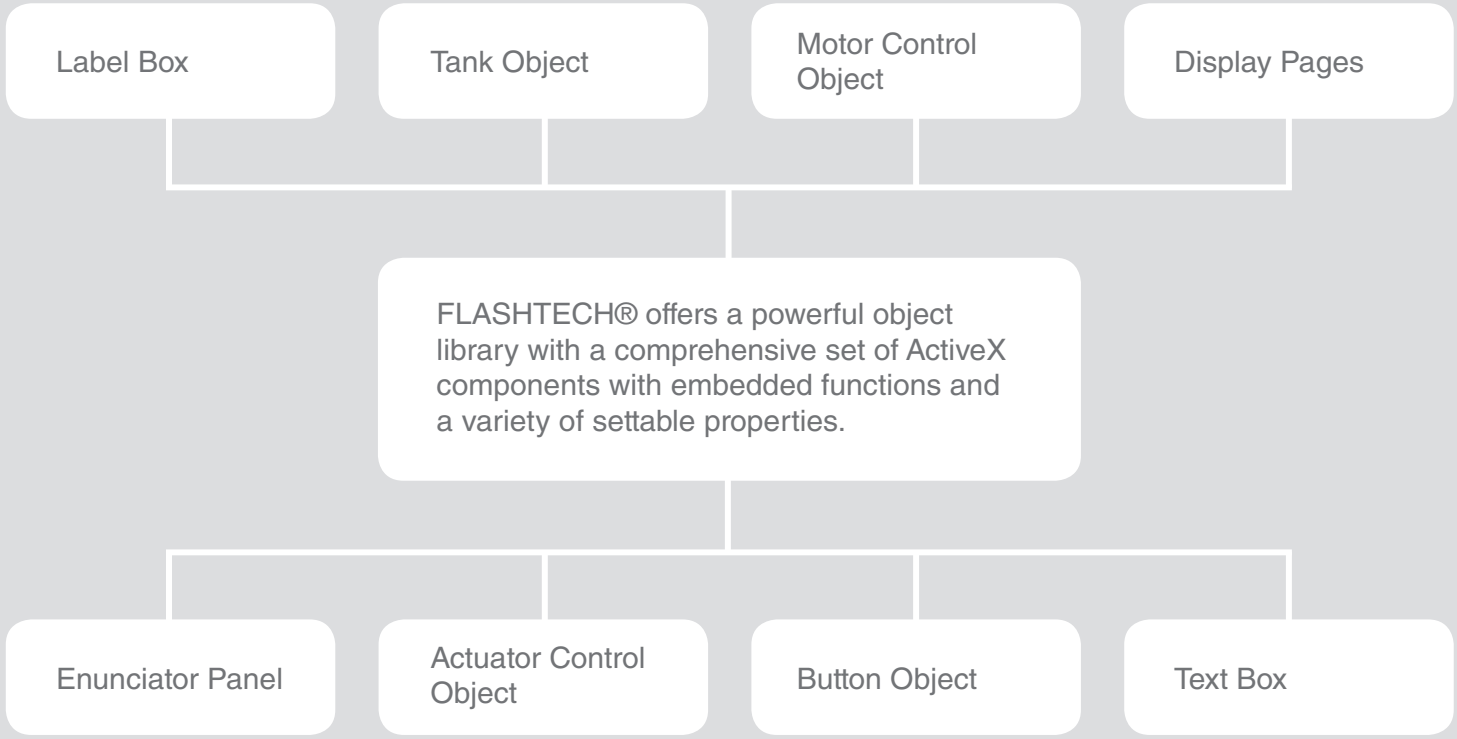
Flashtech® provides a very efficient SCADA interface for terminal operations. We conceive a full automatic terminal automation system as the one that present a single interface to the user as far as the following functions are concerned:

Order Management
Tank Operations
Load Rack Automation
SCADA functions

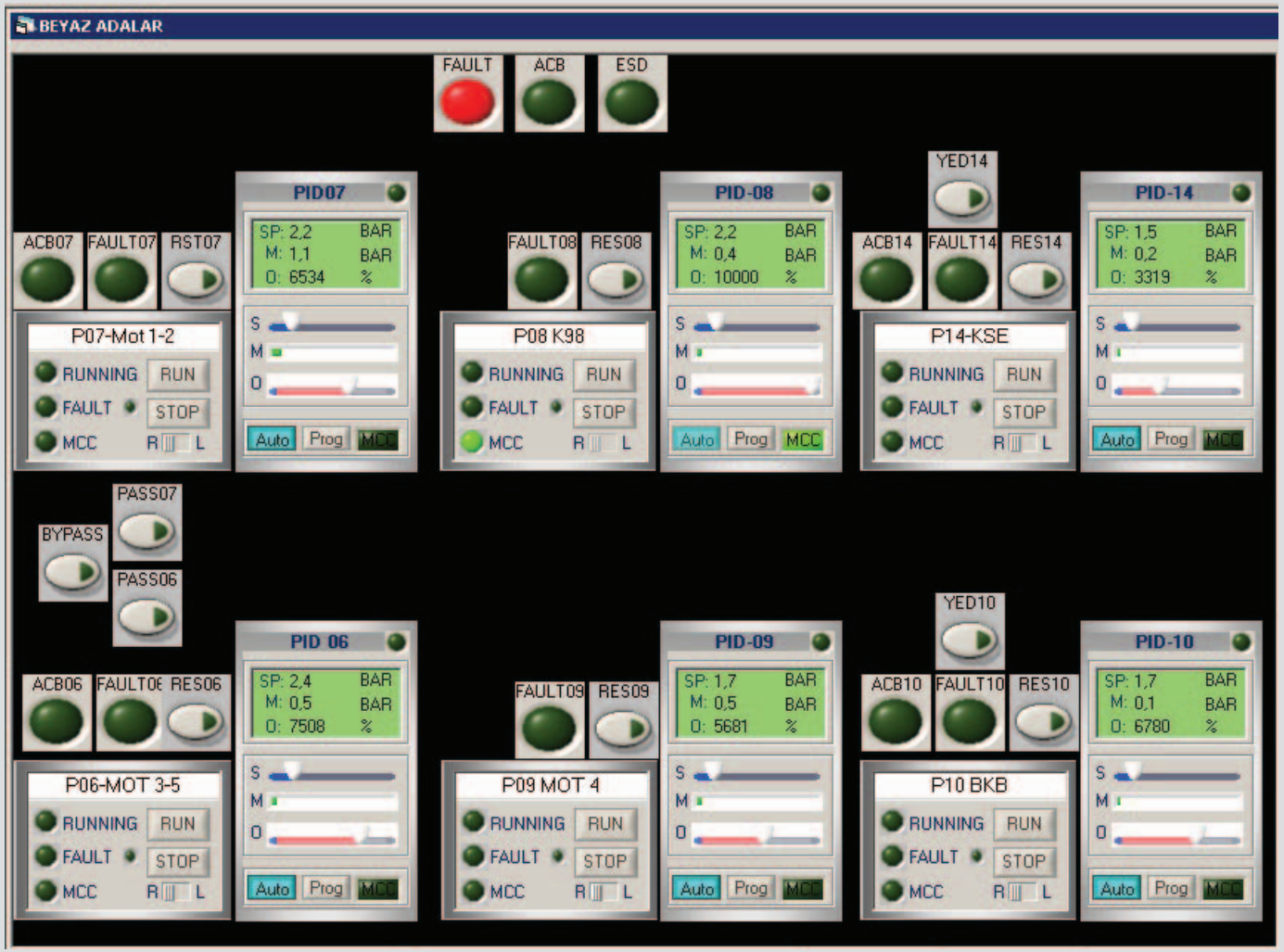


SCADA Builder

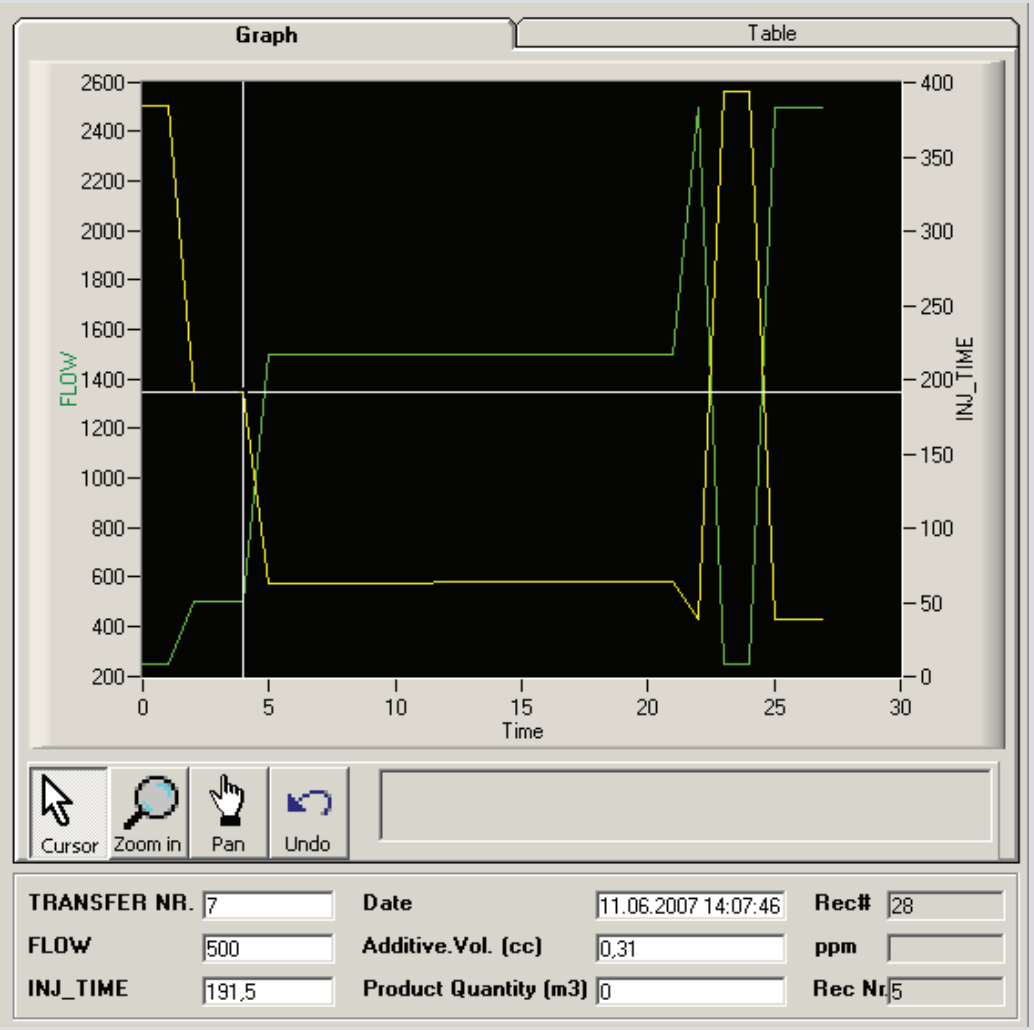
Together with Accuload III Electronic Preset and powerful OPC interface for the third party PLCs, Flashtech creates a powerful SCADA system.



Object Library

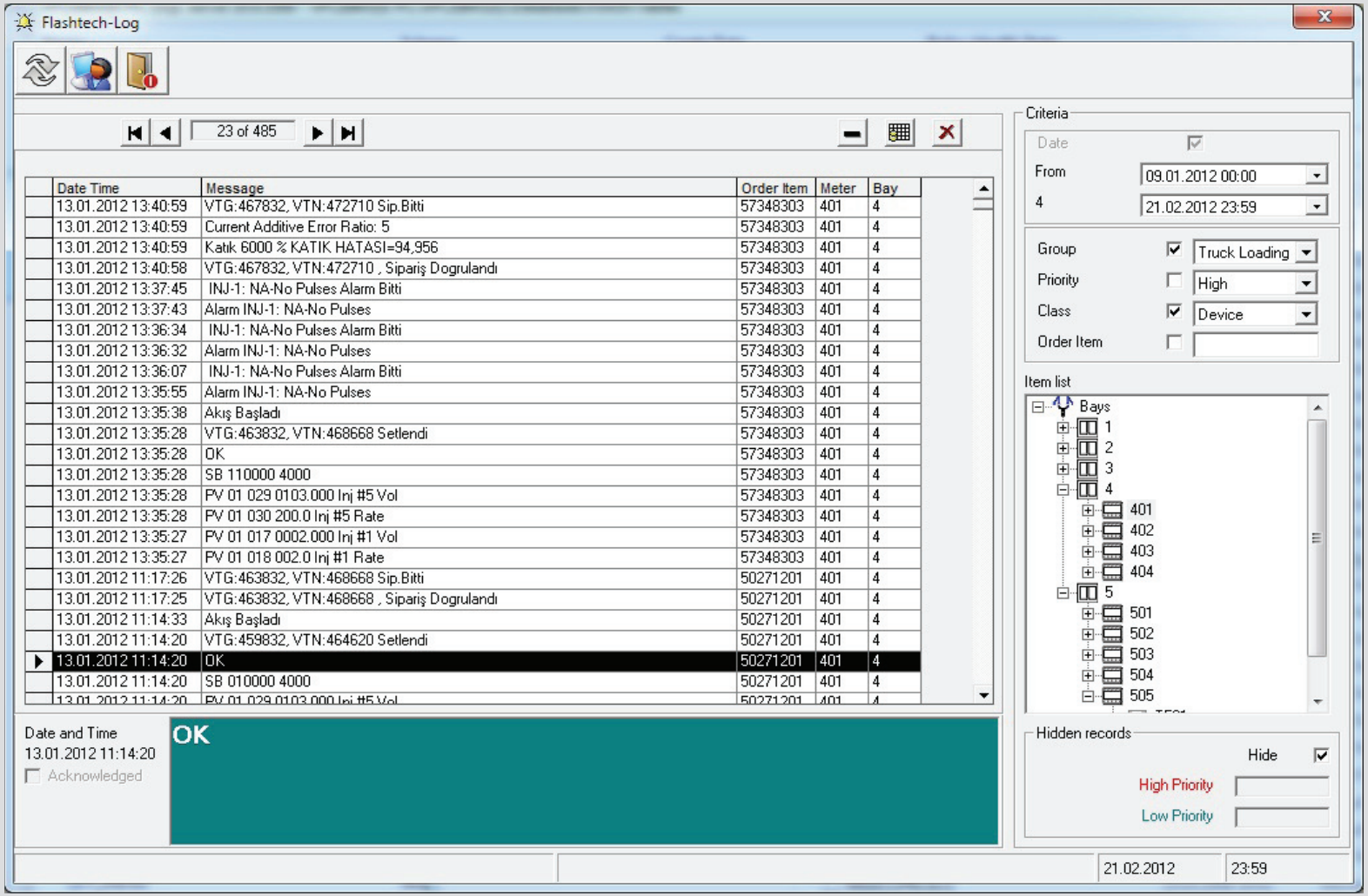


Run Time Module



Trending

- Flashtech® offers real time and historical trending for a comprehensive set of user selectable process variables.
- Trend pages present data in graphical and tabular forms.
- Trend pages can be configured as multi-pen recorders with a rich set of properties and methods that enable read data with a high degree of precision.

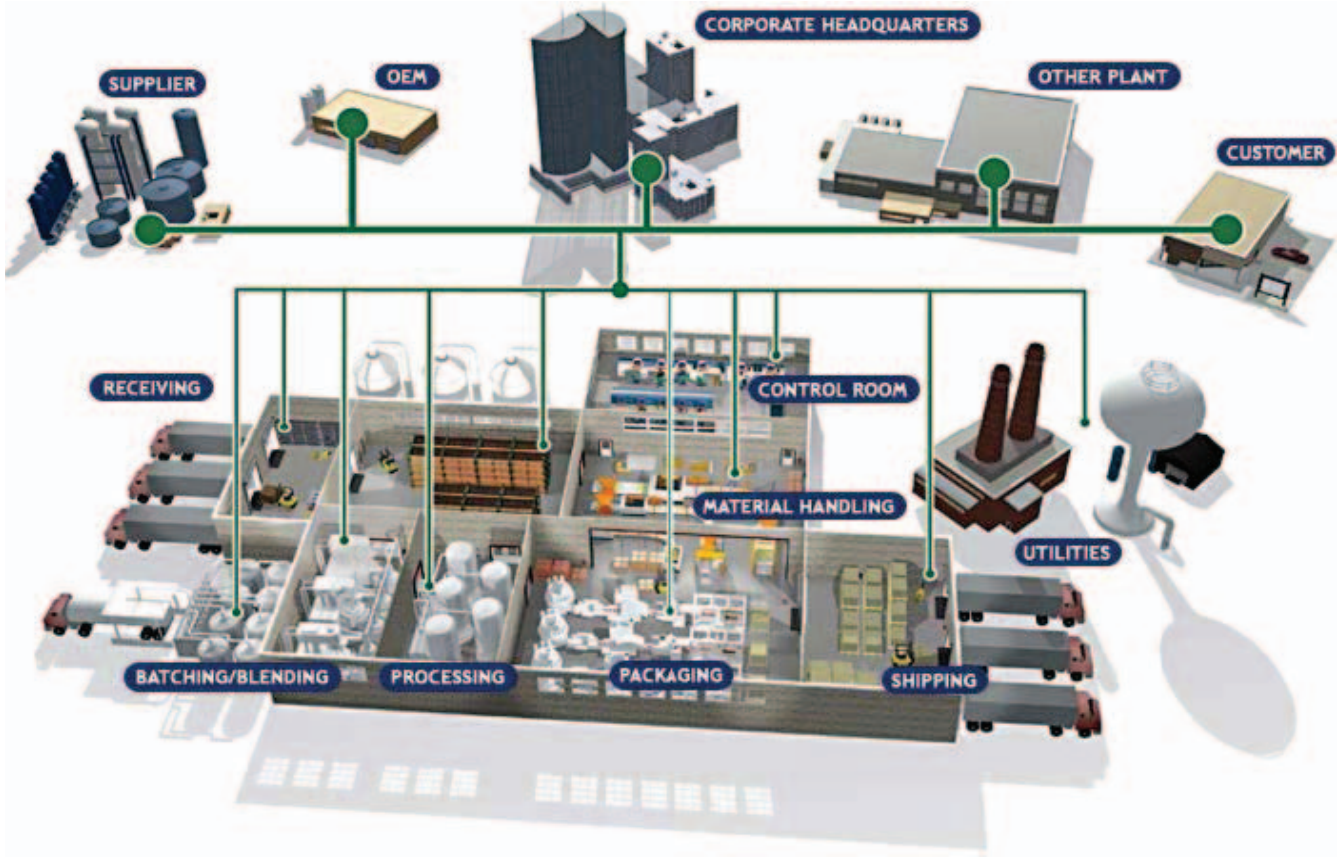


Alarm/Event Management

For a fast-access to information, Alarm/Event management algorithm is composed of a relevant set of categories that enable locate information from plant wide categories down to device level.

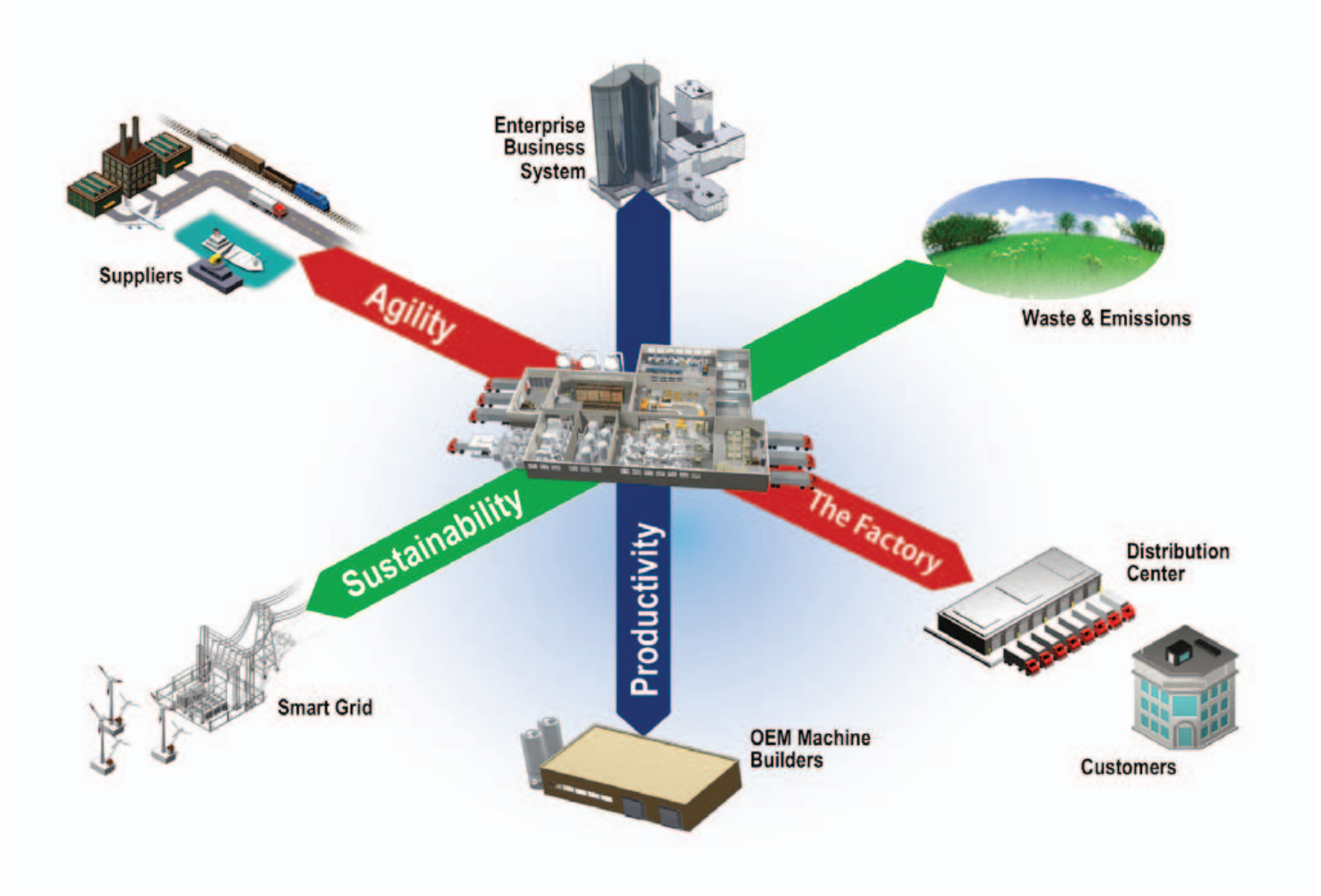
Load Rack Automation

- Compartment based loading
- Load request validation
- Meter-Tank product density cross-checking
- Monitoring of real time data
- Tracing of orders and trucks
- Alarm/Event management

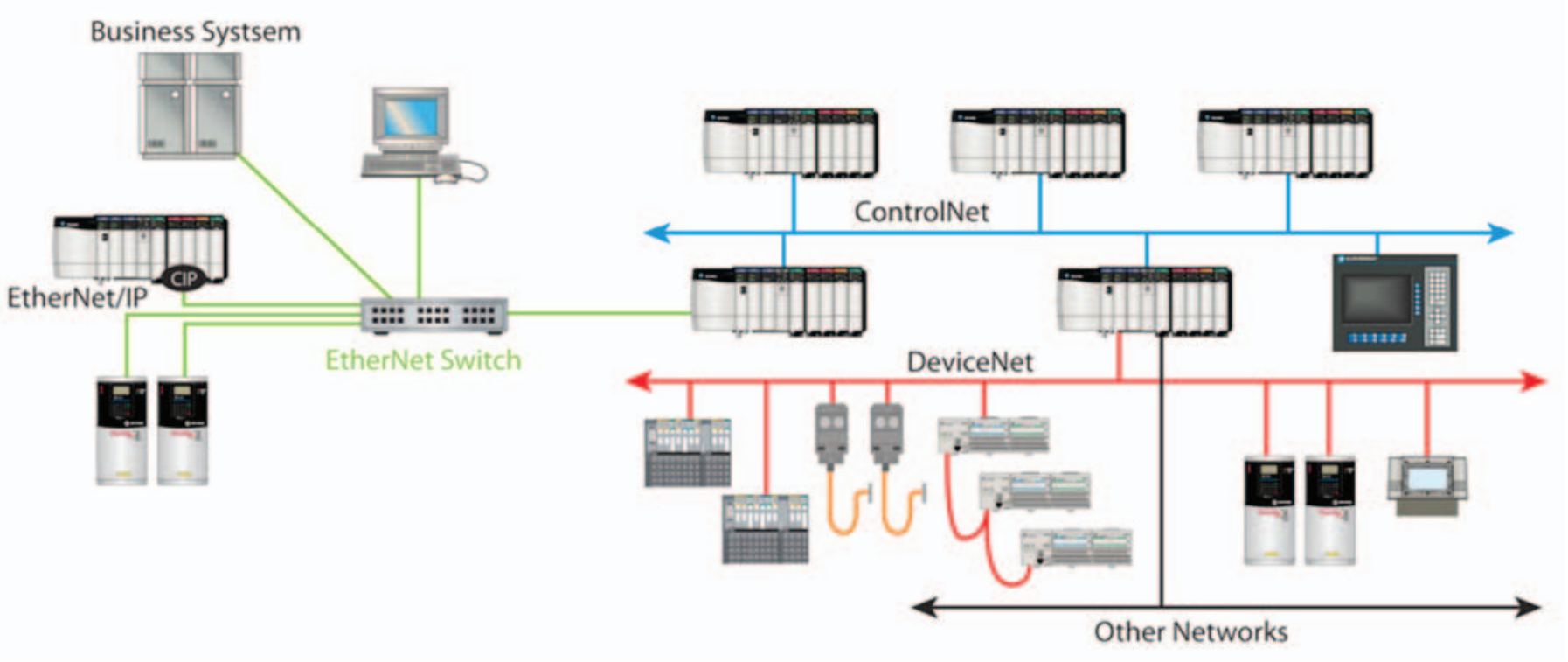


System Integration

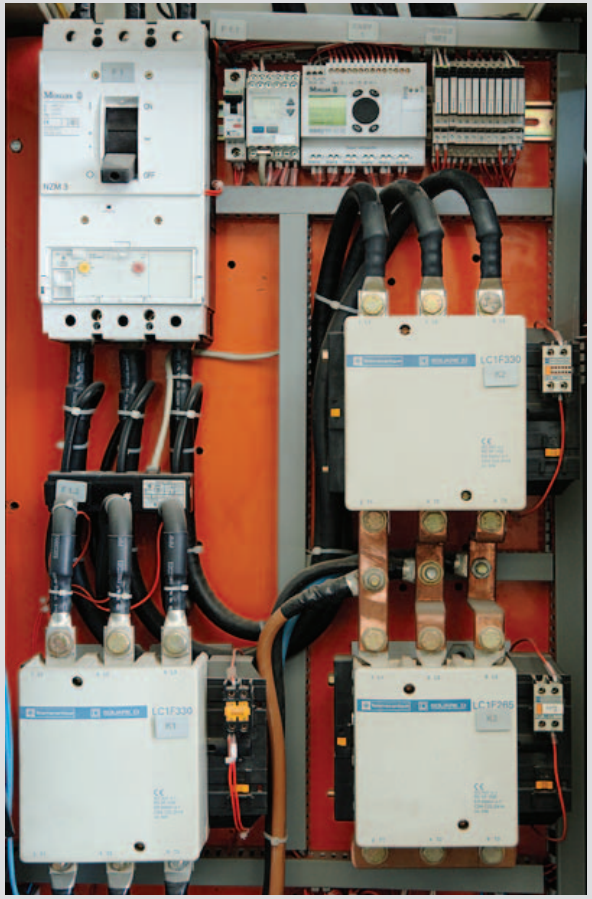
As a System Integrator, MEGA range of solutions primarily cover Oil & Gas, Refinery Automation, Energy and Water industries.

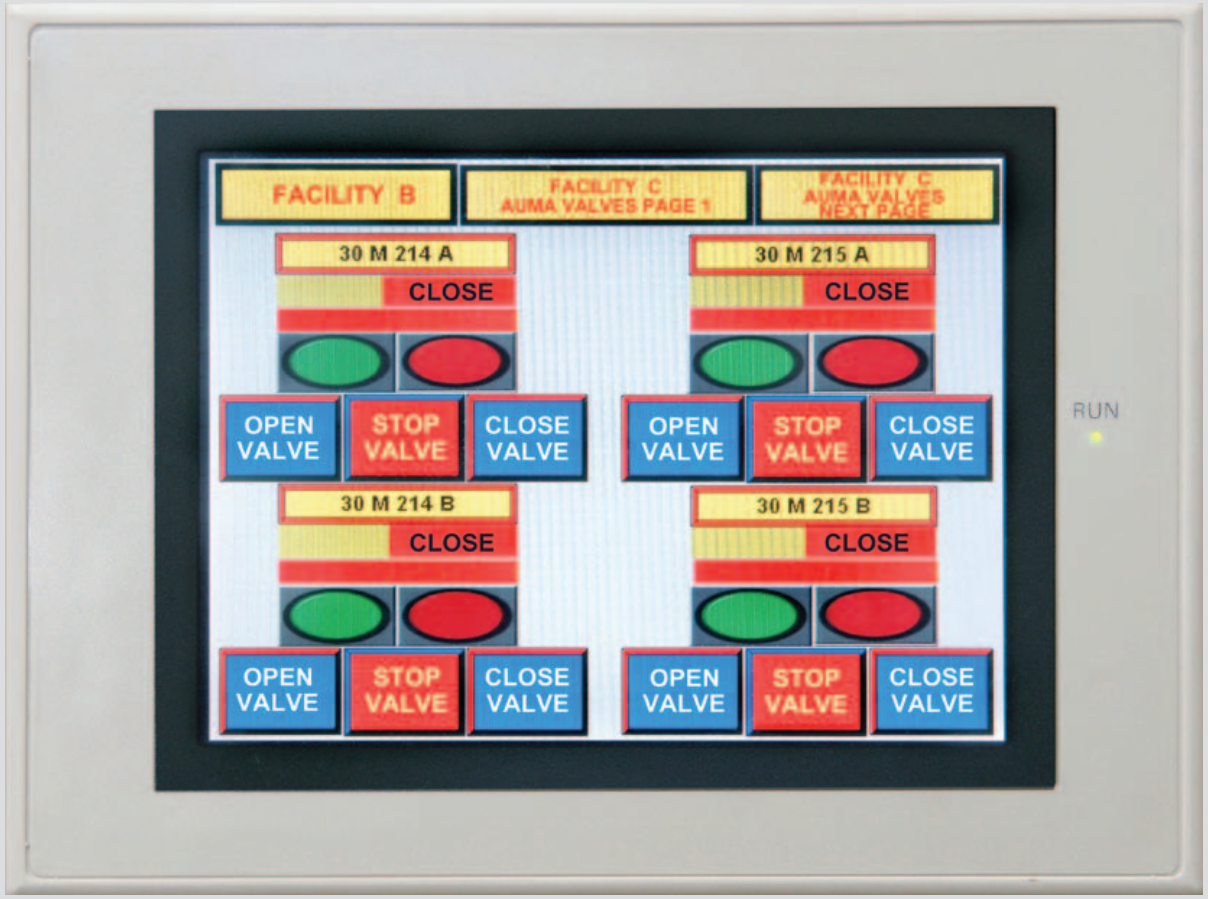


- Plant wide Integration.
- Fast and efficient information flow across the organization.



As a system integrator, we interface with all third party PLC and DCS systems using OPC.





Terminal Automation System PUMP CONTROLS

- Variable Frequency Drives (VSD) are used almost in all terminals for cost reduction and best automation practices.
- Product Loading pumps start/stop on flow demand rate basis received from Preset's pump demand outputs.
- On demand rate of one loading arm/bay, PLC calculate discharge flow rate and start one loading pump at the predetermined frequency.
- On increasing load demand, the PLC modulates the VSD until the second product pump will start.
- Pump stop sequence are exactly reverse as the pump start sequence.
- Pump start/stop sequence are done by PLC, calculating running hours.

Terminal Automation System ESD CONTROL

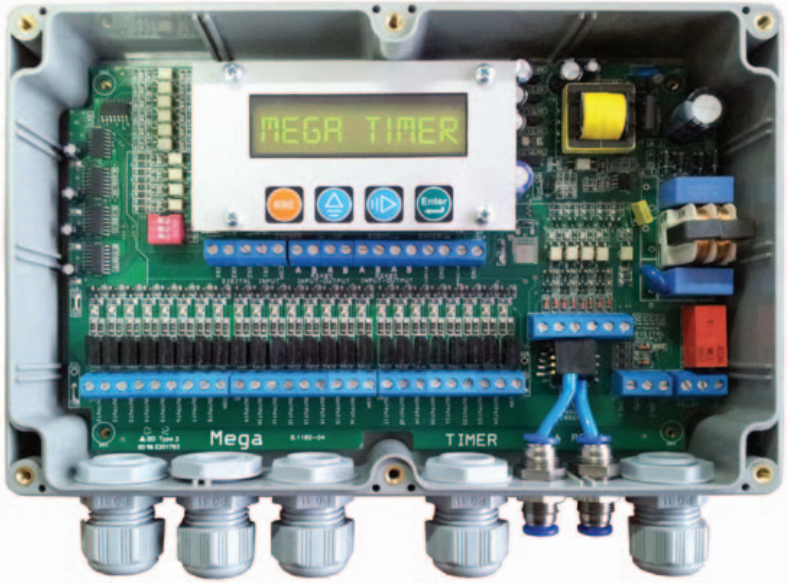
A PLC based Emergency Shut Down logic insures the security of the terminal against overfills and other hazardous conditions.

An orderly shut down scenario can be programmed based on the terminal requirements.

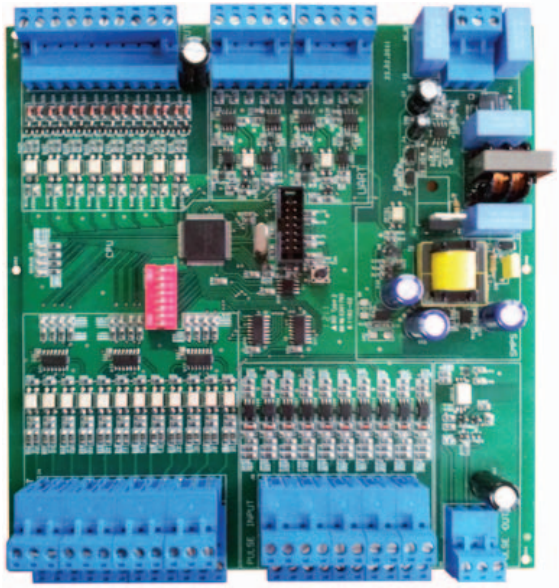
Terminal Automation System FIRE ALARM DETECTION & CONTROL

- A dedicated PLC is used for Fire Fighting system.
- SIL 3 level of protection can be offered as an option.

Mega Timer



Flashware



Pulse Synchronizer

MEGA-Electronic Manufacturing Line

MEGA manufactures various electronics and interface modules as a complementary product line to support its system integration business.

- Flashware Weigh Bridge interface/Preset controller
- Multiple point Timer controller
- Card Reader Electronics
- Data Concentrator/Ethernet-Serial converter
- Custom interfaces as required by particular applications

- Graphical user interface
- Ease of operation
- Remote access through IP adressing
- Wide range of host and SCADA interfaces
- Universal OPC interface
- Object based software technology
- ORACLE and SQL as default database options
- Low initial cost
- Low cost of ownership

Benefits

- Improved reliability and efficiency
- Security and supervision of loads
- 24 hours operations
- Control and monitoring of loading process
- User configurable terminal operations
- Seamless TAS-SCADA integration
- Expansion capabilities
- Can be used in any language

Security

- Prevents unauthorized access
- Insure correct product loading
- Order validation
- Driver/Vehicle validation

Economy

- Reduced installation and operation cost
  - *Reliable, fast and efficient supervision & control through user friendly operator interface*
  - *Improved product and service quality*
  - *Improved order management*
  - *Comprehensive report and document generation*
  - *Scheduling of vehicles onto site to prevent congestion*
- Elimination of the need for a database administrator
- Control and supervision of terminal operations through single source responsibility
- Low cost system upgrades

Expansion Capabilities

- Tailor made terminal definitions
- Unlimited number of load arm support
- No additional cost for system expansion
- No additional cost for system upgrades
- OPC and ActiveX SCADA interface for wide range of PLC and DCS systems
- Ready for ethanol, biodiesel, blending and other possible future applications

Programming Technology

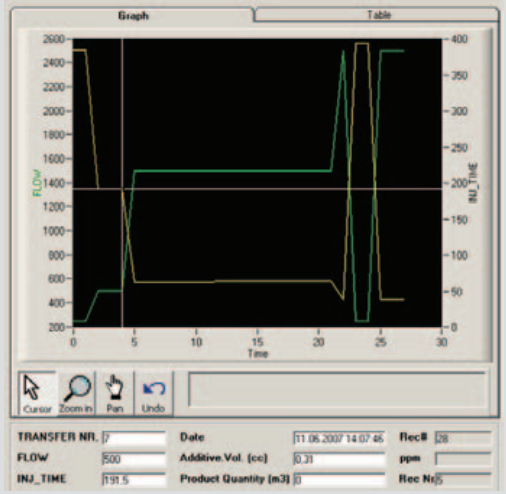
- Object oriented event driven programming
- OLEDB Provider for Data Base access
- IP addressing for LAN & WAN data transfer
- ERP, SRP, SAP and custom host interface
- Wide range of real time and historical data retrievial
- Flexible reporting
- Elimination of the need for a database administrator

Revamping / Retrofitting

- Site survey for definition of the customer requirement covering:
  - *Load Rack equipment*
  - *MCC & PLC equipment*
  - *Supervisory system hardware, software and network components*
  - *Host Interface*
  - *Data Base analysis*
- Project management
- Implementation, installation supervision
- System configuration, commissioning, start-up assistance, operator training
- Maintenance and service contracts
- On-call, remote and on-site support
- Consultancy services

We bring innovative solutions for old installations with obsolete technology offering these services through single source responsibility.

We replace your old and bulky load Rack equipment with the latest Technology Multi Arm Electronic Presets eliminating the need for separate injection controllers.



We replace your bulky MCC and Control Room equipment with an advanced PC based SCADA interface.

References


opet


Tüpraş


LUKOIL
OIL COMPANY


euroil


OMV


TURKISH OPET
AVIATION FUELS


bp


BOTAŞ


ExxonMobil


Aytemiz


BEST oil


KAR Group


ÇEKİSAN
Depolama Hizmetleri


IRAQOIL


aves


FULL


Tezkim


ENKA TEKNİK


oil


NuStar
Energy LP


TP


PETLINE


TOTAL


K-Pet


konya şeker


BIL


AkımTek


petroturk


MOTOR OIL (HELLAS)
CORINTH REFINERIES S.A.


TARKİM


TUTA


Petroleum

MEGA

Industrial Control Systems

Mega Endüstri Kontrol Sistemleri Tic. Ltd. Şti.

Yaşamkent Mah. 3207. Cad. 3204. Sok. No: 8
06810 Çayyolu, Ankara, Turkey

t +90 (312) 217 32 88 ***f*** +90 (312) 217 33 88

megaendustri@megaendustri.com.tr

www.megaendustri.com.tr

Flashtech®