

Truck Manager®

Information System for Oil Terminal Automation

Software overview

TruckManager is a system for monitoring, controlling and managing the fuel loading process in oil terminals. **TruckManager** is commissioned at the AVIN OIL Loading Terminal since 1997. Other installations include BP terminals, SHELL terminals, RPI terminals, SUN Oil and KA Oil. **TruckManager** consists of the following subsystems:

- Loading management system
- Isle automation system
- Terminal gate and truck weighting
- Deliveries and customs clearance
- Tank Gauging Software
- Printing subsystem for invoices, bills of lading, client files, price lists and discounts
- Central monitoring and control
- SCADA subsystem for monitoring and control of station pumps and valves.
- Interfacing to ERP software (e.g. SAP)

Basic features of **TruckManager** are:

Loading management system

- Entry and management of loading orders
- Printing of loading orders
- Manual entry of loading data in case of non automated isles or loss of communication
- Print out of bill of lading. The bill of lading is customizable according to requirements
- Configuration of LCUs, isles and system parameters
- Management of truck driver data base
- Management of client data base
- Management of trucks and compartments data base
- Management of users and access levels

Isle automation system

- Supports loading isles of either bottom loading or top loading with LCUs such as Accuload II, Accuload III, Masterload II, Petrocount, ISOil
- Truck driver access control and control of ordered fuel quantities. Interface with Badge Reader System
- Loading scheduling
- Graphical overview (mimic diagram) of isles and trucks with on line display of measurements
- Software enabled Emergency Shut Down and LCU disable function
- Alarm logging and handling
- Event logging and event-printing
- Automated self checks for proper operation and loading data (constant cross check of totalisers and bills of lading)
- Truck driver information panel for queue orders and unexpected waiting time.
- Detailed reports and statistics

Terminal gate and truck loading

- Arrival and departure time registering
- Entry and exit weighting
- Loading control based on gross and net weights

Delivery and customs clearance

- Management of terminal products and tanks
- Entry and management of product delivery protocols
- Entry and management of customs clearance operations
- Product inventories and management of product surpluses or deficits
- Management and reporting on stocks and available quantities
- Control of loading process based on available quantities and customs clearance lists

Additives Subsystem

- Additive automation
- Additive management

Tank gauging software

- Interface with tank gauging system hardware (e.g. ENRAF) for on-line monitoring and display of tank levels, temperatures, densities and water levels
- Calculated Gross, Net and weight values of products in tanks based on tank strap tables
- Monitoring and handling of High, High-High, Low and Low-Low level alarms
- Graphical display (mimic diagram) of terminal tanks.
- Historical data base of tank measurements
- Trend charts of tank measurements
- Data reconciliation of measured and expected quantities based on delivery protocols and loading data

Printing subsystem for invoices, bills of lading, client files, price lists and discounts

- Management of client records, debits, credits, discounts payment methods
- Product price list
- Regional configuration for products and prices
- Truck delivery schedule
- Updating of oil movement book
- Print out of invoices and bills of lading
- Monitoring and control of payments and cashier
- Interface with standard accounting or ERP software (SAP)

Central monitoring and control

Centralised access to the oil terminal operations from the company head offices. In detail the head offices have access to the following data:

- LCU start and end totalizers
- Daily deliveries and loadings rundown
- Change of oil terminal LCU parameters
- Totalizer continuity cross check
- Alarm monitoring and handling

SCADA subsystem

SCADA subsystem for monitoring and control of station pumps and valves:

- Overall station mimic display
- Automated startup and shutdown of product pumps based on current and expected loading orders
- Remote control of pumps and valves
- Interlocks
- Event and alarm monitoring
- User customizable station configuration
- OPC client for the communication to Industrial Control Systems and PLC's.

Other features

- Daily balances and historical data
- Oil terminal operation data print out on daily, monthly and annual base
- User and access level management
- Interface with electronic weighting system.
- Interface with badge readers
- Detailed activity logging
- Data Base mirroring and back up
- Interface with MS Excel for statistical analysis purposes

Sample Screens and Forms

Form used for the definition and description of the station's products

ID	Short Name	Product Name	Color
1	S	SUPER	0
3	U	UNLEADED	1
4	D	DIESEL	2
5	H	HEAT	3
6	F1	M 1500	0
7	F3	M 3500	0

Form used for determining and managing truck driver data

ID	Surname - Name	Code Number	License	Expires	ADR
135	*****	00153			
184	ANDONI	00184			
170	BASKINI	00170			
181	DOUSKA	00181			
212	KATSANI	00212			
183	KIRITSI	00183			
201	KIRITSI G	00201			
177	MIDIS	00177			
176	MODIS	00176			
175	NATSI	00175			
145	ΑΓΚΑΣ	00145			
75	ΑΔΑΜ	00075			
110	ΑΒΑΝΑΣΟΠΟΥΛΟΣ	00110			
171	ΑΝΔΡΟΥΤΣΟΣ	00171			
23	ΑΝΕΣΤΗΣ	00023			
18	ΑΝΤΩΝΙΟΥ	00018			
66	ΑΡΒΑΝΙΤΗΣ	00066			
144	ΑΡΜΑΤΑΣ	00144			

Form used for determining and managing truck and tanker compartment data

ID	Plate Num	Trailer Num	TA	TB	Company	MOT	LIC
390	*****		NO	NO			
456	FR 5826A		YES	NO	AVIN OIL		
433	GJ 0212A		YES	NO	ΔΙΑΜΑΝΤΗΣ		
432	GJ 2411		YES	NO	12		
450	GJ 3072		YES	NO	EXPORT ZALAVRAS		
420	GZ 2993		YES	NO			
426	GZ 3095		YES	NO			
427	GZ 4377		YES	NO			

ID	Trailer	SN	Capacity
3253	NO		

Main Capacity:
 Trailer Capacity:
 Total Capacity:

Company: AVIN OIL
 Driver: *****

Form used for real-time entering of loading order data and overall monitoring of the loading process

Truck Manager - Client Module - [Loading Orders]

File Administration Tasks Reports ESB

Waiting				
SN	Time	I	Driver	Truck
4	17:57	T	FATOS ISMAILI	BR 4349A
3	17:56	T	FATOS ISMAILI	BR 4349A
2	17:52	T	NASTO TELEMAK	FR 9328 A

Loading Order Data				
SN	1	Com	<input checked="" type="checkbox"/>	Time 15:37
Truck	FR 1511A			
Trailer	(3) E B			
Driver	ISLAMAI ARTAN			
Company	MOLD OIL			
Stamps	335467	335472	0	0

Product Totals				
Prod	Order	Gross	Net	Avail.
S	13000	13000	13000	330076
U	13000	13000	13000	281235
D	7000	7000	7000	448963

Calc. Gross 0

Compartment quantities										
Comp	Prod	Preset	Customer	Gross	Net	Met	Start	End	Done	
1	S	13000	AGBES SHPK	13000	13000	e3	17:17	17:17	NAI	
2	D	7000	ALBANIA OIL	7000	7000	e2	17:17	17:17	NAI	
3	U	13000	AGBES SHPK	13000	13000	e4	17:17	17:17	NAI	

S	C.ID	Type	Customer	Scope	PayM	Comp.	D. ID	Address
1	1021	EXF	AGBES SHPK	JF	2000	1.3		
2	1959	EXF	ALBANIA OIL	JF	2000	2		

Being Served

SN	Time	I	Driver	Truck
1	15:37	B	0	ISLAMAI ARTAN FR 1511A

Finished

SN	Time	I	B	Driver	Truck	%
1	15:37	B	0	ISLAMAI ARTAN	FR 1511A	

Bill of Lad Print Report Load Analysis Invoices Refresh Exit

Truck Manager - Client Module - [Loading Orders]

File Administration Tasks Reports ESB

Waiting				
SN	Time	I	Driver	Truck
4	17:57	T	FATOS ISMAILI	BR 4349A
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Being Served				
SN	Time	I	Driver	Truck
1	15:37	B	0	ISLAMAI ARTAN FR 1511A

Finished						
SN	Time	I	B	Driver	Truck	%
1	15:37	B	0	ISLAMAI ARTAN	FR 1511A	

Bill of Lading

MOLD OIL

COMPANY: MOLD OIL DATE: 05/04/2000

ORDER: 1

TRUCK: FR 1511A TRAILER:

DRIVER: ISLAMAI ARTAN

TIME IN: TIME OUT: 17:19

PETROL LOADING BOOK <LIC 27/85>

PETROL TOTALS : TRUCK 7000 TRAILER 0

BILL OF LADING

	LITRES @TEMP	LITRES @15 C	START TOTALIZER	END @15C TOTALIZER
SUPER	: 13000	13000	33192459	33205459
UNLEADED	: 13000	13000	16918279	16931279
D AUTO	: 7000	7000	37566256	37573256

Refresh On line History Print H Print OK

Bill of Lad Print Report Load Analysis Invoices Refresh Exit

Truck Manager - Client Module - [Invoices]

File Administration Tasks Reports ESB

Order 1 Driver ISLAMAI ARTAN Truck FR 1511A SAP p

Customers

S	Cust ID	Customer	Comp.	Price	VAT	Total	PayM	Inv S	Inv. Num	Chek Num	Bank	Exp
▶	1	1021	1021	1,3	26.000	4.680	30.680	2000	ABΓΔE	1012		
	2	1959	1959	2	7.000	1.260	8.260	2000				

Cust.ID	Customer	Prod.	CT	Order	Gross	Net	Weight	Temp	Dens	Unit Pri	VAT	S.Sec	Total
▶	1021	1021	S	E	13.000	13.000	9.477	15,00	9729,0	1,00	18		15.340
	1021	1021	U	E	13.000	13.000	13.000	9.450	15,00	9726,9	1,00	18	15.340
	1959	1959	D	E	7.000	7.000	7.000	5.916	15,00	9845,2	1,00	18	8.260

Product	Total
▶ S	13000
U	13000
D	7000

Preview Invoice Preview Routing Local Mode

Print Invoices Update SAP Cancel Invoices OK

Screen for monitoring the loading site

Truck Manager - Client Module - [Load Management]

File Administration Tasks Reports ESB

Position 1: 1 a1 OFF OUT OF ORDER

a2 OFF OUT OF ORDER

a3 OFF OUT OF ORDER

a4 OFF OUT OF ORDER

Position 3: 3 b1 ESB DRIVER ID 15.1 6200 6076

b2 ESB DRIVER ID 15.1 6200 6076

b3 OFF OUT OF ORDER

b4 OFF OUT OF ORDER

Position 5: 5

Position 6: 6 c1 ESB A GROUND 15.1 7550 10339

c2 ESB A GROUND 15.1 23600 23128

c3 ESB A GROUND 15.1 8000 7840

c4 ESB A GROUND 15.1 6500 6370

Position 7: 7 d1 ESB D GROUND 15.1 5650 5537

d2 ESB D GROUND 15.1 3060 2999

d3 ESB D GROUND 15.1 5481 5371

d4 ESB D GROUND 15.1 5650 5537

Position 8: 8

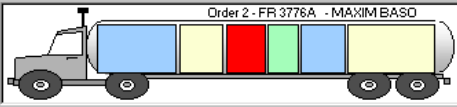
Order 2 - FR 3776A - MAXIM BASO 9 e1 ESB NO MORE PRODUCT 15.1 4500 4410

e2 ESB COMPARTMENT 15.1 0 0

e3 ESB COMPARTMENT 15.1 70461 69460

e4 ESB COMPARTMENT 15.1 70461 69460

Exit Auto Alarm Clear Orders ESB



Tank Manager Screen

Truck Manager - Client Module - [Tank Manager]

File Administration Tasks Reports ESB

T-51 UNLEADED

8629 mm 726.9 kgr/m³ 1.408.751 GOV
13.34 °C 1.026.274 kgr 1.411.850 GSV

	Meas.	Calc.	Diff.
Avai		24.543.341	
Del		24.591.441	
Ld		41.900	
Pen		6.200	

Flow0 Ac Active

T-52 D HEAT

1542 mm 843.7 kgr/m³ 264.227 GOV
15.62 °C 222.839 kgr 264.121 GSV

	Meas.	Calc.	Diff.
Avai		41.825.061	
Del		41.876.237	
Ld		28.290	
Pen		12.400	

Flow0 Ac Active

T-53 SUPER

9353 mm 725.7 kgr/m³ 1.525.066 GOV
10.71 °C 1.112.717 kgr 1.533.301 GSV

	Meas.	Calc.	Diff.
Avai		18.492.492	
Del		18.492.492	
Ld		0	
Pen		0	

Flow0 Ac Inactive

T-54 SUPER

1565 mm 729 kgr/m³ 268.599 GOV
14.17 °C 195.985 kgr 268.841 GSV

	Meas.	Calc.	Diff.
Avai		19.528.121	
Del		19.612.721	
Ld		72.200	
Pen		12.400	

Flow0 Ac Active

T-55 D HEAT

10052 mm 843 kgr/m³ 1.638.557 GOV
15.39 °C 1.380.751 kgr 1.637.902 GSV

	Meas.	Calc.	Diff.
Avai		44.308.338	
Del		44.308.338	
Ld		0	
Pen		0	

Flow0 Ac Inactive

T-56 D AUTO

6010 mm 845.2 kgr/m³ 987.503 GOV
13.21 °C 835.889 kgr 988.984 GSV

	Meas.	Calc.	Diff.
Avai		36.325.599	
Del		36.385.165	
Ld		47.290	
Pen		6.200	

Flow0 Ac Active

T-57 F OIL 3500

3946 mm 992 kgr/m³ 578.058 GOV
49.94 °C 559.672 kgr 564.185 GSV

	Meas.	Calc.	Diff.
Avai		8.741.537	
Del		8.741.537	
Ld		0	
Pen		0	

Flow0 Ac Active

T-58 F OIL 1500

8690 mm 984.6 kgr/m³ 1.242.094 GOV
57.02 °C 1.187.377 kgr 1.205.949 GSV

	Meas.	Calc.	Diff.
Avai		12.617.925	
Del		12.617.925	
Ld		0	
Pen		0	

Flow0 Ac Active

T-59 D AUTO

689 mm 845.2 kgr/m³ 83.043 GOV
11.91 °C 70.364 kgr 83.251 GSV

	Meas.	Calc.	Diff.
Avai		20.164.946	
Del		20.164.946	
Ld		0	
Pen		0	

Flow0 Ac Inactive

Tank Data Trends Acknowledge Alarms Tank History OK

Deliveries and Customs Clearances

Truck Manager - Client Module - [Delivery Protocols - Customs Clearance]

File Administration Tasks Reports ESB

Inventories

Protocol	Date	Tank	Pr	GSV	Or	Type
	31/01	T-51	U	842.528		Ανοργ
	31/01	T-52	H	1.129.508		Ανοργ
	31/01	T-53	S	1.533.352		Ανοργ
	31/01	T-54	S	787.532		Ανοργ
	31/01	T-55	H	127.610		Ανοργ
	31/01	T-56	D	1.632.308		Ανοργ
	31/01	T-57	F3	710.203		Ανοργ
	31/01	T-58	F1	745.934		Ανοργ
	31/01	T-59	D	446.169		Ανοργ

Deliv ID:

Tank: T-51

To be Deliv.:

Day: 31/1/2000

Product: U

Quantity: 842.528

Measurement

Time:

Level: 5093

Temp: 12

Density: 726.7

Meas. GSV: 842.528

Product Totals Date: 31/01/2000

Προϊόν	Μετρ.	Υπολ.	Διαφθ.	Διαφορά
S	2.320.884	2.316.484	4.400	0
U	842.528	842.633	-105	0
D	2.078.477	2.081.447	-2.970	0
H	1.257.118	1.254.961	2.157	0
F1	745.934	749.989	-4.055	0
F3	710.203	709.336	867	0

Refresh Measured Quantities Correct Deficit

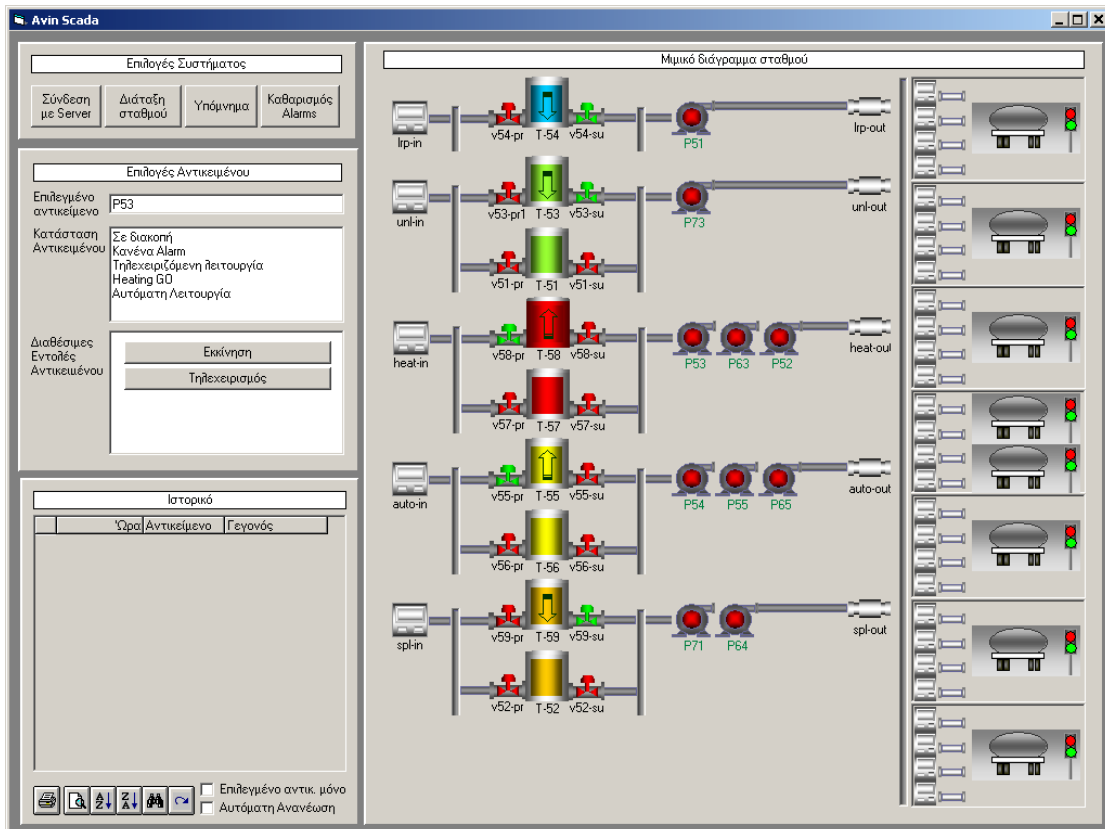
Deliveries

Protocol	Date	Trnk	Prod	GSV	Or	Available

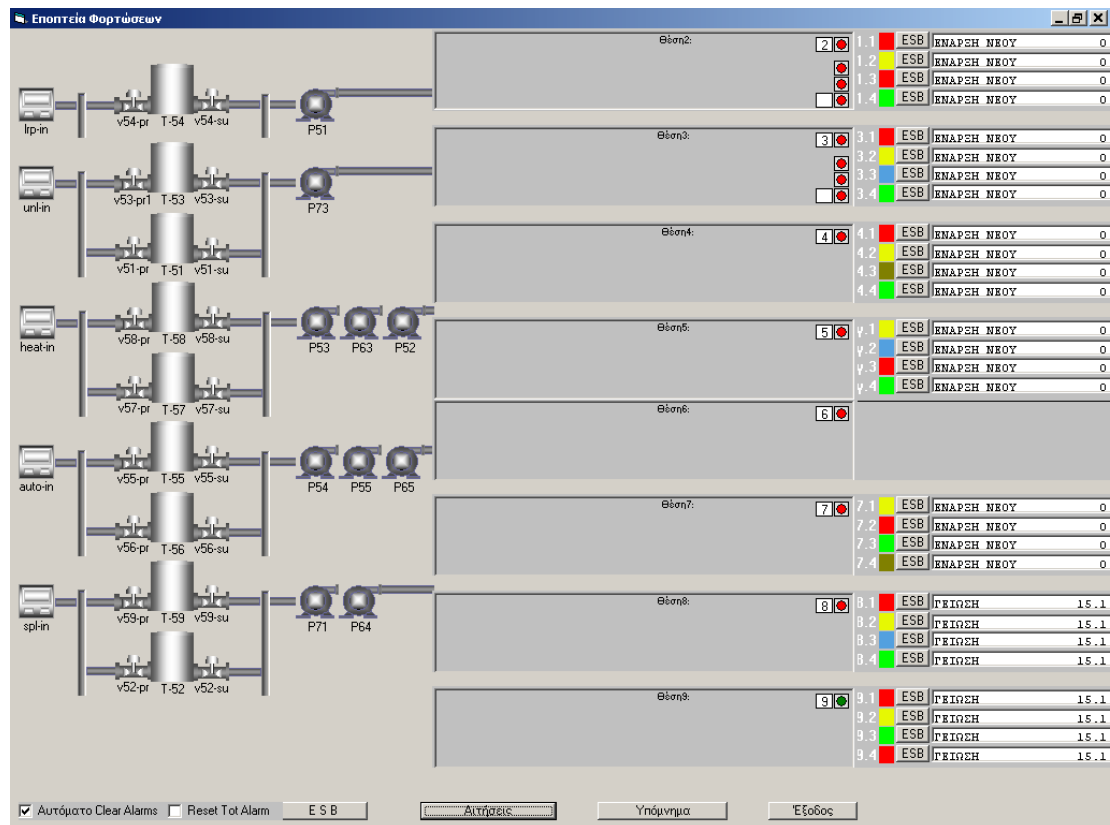
Delivery Distribution

Company	Date	CT	Initial	Delivered	Available

SCADA Subsystem



Overall Station Mimic Diagram



References

TruckManager has been installed at the following sites:

<i>Oil Terminal</i>	<i>Installed subsystems</i>						
	<i>Loading MGMT</i>	<i>Isle Automation</i>	<i>Gate</i>	<i>Deliveries-Customs</i>	<i>Tank Manager</i>	<i>Invoices</i>	<i>SCADA</i>
AVIN Ag. Theodori	YES	YES	YES	YES	YES	YES	YES
EKO Alexandroupoli*	YES	YES	NO	YES	NO	NO	NO
BP Igoumenitsa	NO	YES	NO	NO	NO	NO	NO
BP Kalamata	YES	YES	NO	NO	NO	NO	NO
BP Heraklion	YES	YES	NO	NO	NO	NO	NO
BP Perama	NO	YES	NO	NO	NO	NO	NO
Shell Amfilochia	NO	YES	NO	NO	NO	NO	NO
Shell Chania	NO	YES	NO	NO	NO	NO	NO
RPI Rhodes	YES	YES	NO	YES	NO	YES	NO
RPI Alexandroupoli	YES	YES	NO	YES	NO	YES	NO
Moldava Giurgiulesti	YES	YES	YES	YES	NO	YES	YES
EKO Durres/Albania	YES	YES	YES	YES	NO	YES	NO
SUN Oil Chalkis	YES	YES	NO	YES	YES	NO	NO
KA Oil Almyros	YES	YES	NO	YES	NO	NO	NO
Cyclon Perama	YES	YES	NO	YES	NO	NO	NO