Terminal Automation, Management And Administration System



ISO 9001:2008 ISO 10006:2004 ISO 14001:2004 OHSAS 18001:2007 NATO FCC

VAE CONTROLS provide

 Engineering activities: full-scale design documentation (mechanical, civil and electrical) from study up to detail design and manufacturing design.

 Procurement and delivery of technology units and equipment, fuel terminals, pipelines, electrical devices, control systems, tailor-made solutions.

For following industries:

Oil & Gas

Water & Wastewater

Environment



VAE CONTROLS

EXPERTS IN AUTOMATION AND TECHNOLOGY FOR OIL&GAS AND WATER INDUSTRY

OUR GUIDELINE

Reliability + Safety + Accuracy = Customer's satisfaction

VAE CONTROLS GROUP **TAMAS**[®]



ISO 9001:2008 ISO 10006:2004 ISO 14001:2004 OHSAS 18001:2007 NATO FCC

System Features

- Automated process control
- Process visualization
- Dispatching control
- Administration of loading/unloading process
- Data exchange with enterprise information systems
- Alarm and event handling
- Emergency Shut-Down
- Reporting
- Data archiving
- Self-service operation using ID cards
- Digital signature handling
- Custody transfer
- Product blending
- Pumps & valves control
- Additive dosing control
- Tank level and pressure monitoring
- Tank balancing
- Prevention of products cross-over mixing
- Leakage protection
- Environmental protection
- Pipe-lines handling, product recognition



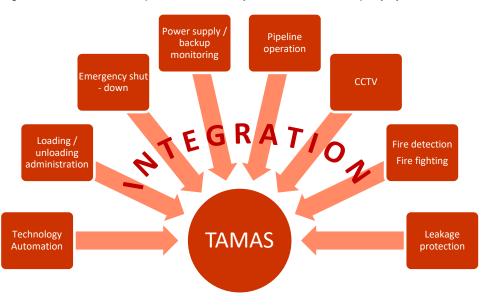
TAMAS[®], what is it?

TAMAS® is a system for overall control of fuel terminals and tankfarms. The basic feature of the TAMAS® system is modularity that provides a solution tailored to fit for each customer and each application from very simple to most complex ones.

TAMAS® includes communication interface for many third-party intelligent field devices like presets, card readers, level gauges, valve drives etc.

In mission-critical applications TAMAS[®] is designed in redundant style, with autonomous ESD part. TAMAS architecrure is robust to make the operation stable and reliable.

TAMAS® is ready to operate as stand – alone master system of the tankfarm as well as fully integrated solution with enterprise information system and other third-party systems.



VAE CONTROLS GROUP **GENERAL INFORMATION TAMAS®**

Terminal Automation, Management And Administration System

TAMAS[®] PLC [Process Automation]

This term refers to a system of one or more PLC devices which ensure signal handling, automated control and emergency shut-down. To provide a robust system with easy expansion and maintenance, each technological part is operated by a separate PLC. These devices communicate mutually and with the upper SCADA system via redundant data bus, mostly made from fiber optic cables.

Typical tasks provided by PLC level are:

- Measuring of flow, mass, temperature, pressure, level, etc.
- · Sensing of status of loading arms, folding stairs, floats, leak detectors, maximum/minimum level switches, grounding monitors and other devices
- · Control of valves, pumps, additive dosing equipment, traffic lights etc.
- · Batch-control, import of loading data (using flow computers and ID card system)
- · Autonomous control of subsystems VRU, water sewage plant etc.
- Emergency shut-down, interface with fire-fighting, CCTV and other system

TAMAS[®] SCADA [Supervisory Control And Data Acquisition]

TAMAS® SCADA is designated to process visualization, high-level automation, dispatching control, event and alarm handling, report printing, and data archiving. The comfortable user interface is based on menus, configurable toolbars, dialogs, reports and hyperlinks on SCADA drawings.

The architecture of the system is Server/Client based. Optional installation of the hot-stand-by server ensures smooth operation even during server failure, or power outage. System of individual users and passwords ensures secure access to data and services, various levels of user privileges as well as administration and development of the system.

The Clear SCADA / SCX system delivered with the TAMAS® system is world-wide standard system with multi-language support, which guarantees expandability and service of the system in future. The system can be optionally equipped with remote service line for diagnostics and configuration. This makes the service extremely quick.



Driver's self-service terminal

TAMAS[®] MES [Administration]

TAMAS® MES ensures administration of tank farm processes, not limited to fuel intake, storage balance, inventory reporting, import of orders, loading schedules, recipes, creation of product receipt documents and delivery notes, registration and identification of drivers, clients, trucks and transactions, configuration of products and additives, export of loading data and many others.

The system is closely integrated with the other parts of TAMAS® to automate administration procedures as much as possible. The same like the SCADA system, TAMAS® MES allows for remote service access which allows that most software modifications can be done remotely.

Operating environment: TAMAS[®] MES client is a Rich Internet Application (RIA) running in web browser. The software may run on the same hardware together with the TAMAS[®] SCADA system. Database is typically latest RDBMS by Oracle. Following technologies are supported for data exchange with other information systems, namely with the ERP system: CSV text files (shared directory or FTP), data exchange on database level (ODBC, ADODB, JDBC), XML files (shared directory or FTP), web services, OPC.

PROFESSIONAL SOLUTIONS FOR OIL&GAS AND WATER INDUSTRY



Electrical panel with PLC system

AUTOMATION VAE CONTROLS GROUP

Terminal Automation, Management And Administration System

Automation of technology processes

TAMAS[®] ensures automation of all the technology processes of the tankfarm.

Thanks to its scalability TAMAS[®] is always designed to meet all the customers requirements:

- Level of automation in relation to applied field instruments
- Highest level of field instruments and automation in relation to investment costs and operational costs.
- Consideration of "Life cycle management" of the tankfarm and control system
- Elimination of human errors of safety critical operations.
- Centralised or semidistributed control
- Single or redundand structure

Most typical tasks for tankfarms automation are:

- Loading / Unloading
- Tanks management
- Pumping
- Pipeline routes, valves
- Vapour recovery
- Additive dosing
- Security (CCTV, electronic security, detectors etc.)
- Fire detection and firefighting

VAE CONTROLS GROUP AUTOMATION TAMAS®

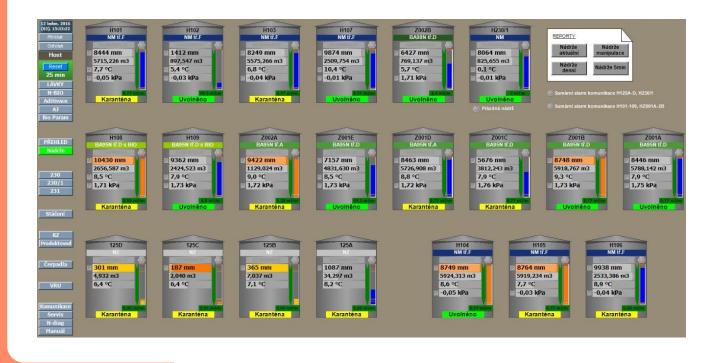
Terminal Automation, Management And Administration System

Automation of technology processes

Automation in our opinion is NOT ONLY REMOTE CONTROL but a set of hardware and software components which mitigates risk of human errors and decreases operation and staff costs.

We offer solution for:

- Interlocks for critical operations
- Algoritmisation of technology processes like pumping between tanks, product loading/unloading etc.
- Product cross-over mixing prevention
- Technology maintenance planning
- Integration with 3rd party technology-related sytems



PROFESSIONAL SOLUTIONS FOR OIL&GAS AND WATER INDUSTRY

ADMINISTRATION TAMAS®

Terminal Automation, Management And Administration System

Administration of loading/unloading process "TAMAS® MES"

TAMAS[®] includes effective tools for administration of the processes related to:

- Road tankers loading / unloading
- Railway tankers loading / unloading
- Ship tankers loading / unloading
- Pipeline transport
- Internal operations
- Sales orders
- Scheduling
- Quality passports
- Documents print and export (Bills of loading, reports, etc.)

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ADMINISTRATION TAMAS®

Terminal Automation, Management And Administration System

TAMAS[®] MES Process schematics

| | Driver arrival and authentication Driver uses identification card and enters PIN on self-service kiosk or he uses card on entrance card reader. If there is no card reader nor self-service kiosk, authentication performs terminal staff or security staff. |
|-----------------------------------|--|
| | |
| IZ-3211 Praha V V V V Trava | 2. Loading schedule The driver can prepare loading schedule on self-service kiosk If there is no self-service kiosk, the loading schedule is prepared by terminal staff. Loading schedule can be prepared in 3rd party system and imported into TAMAS. Then it is activated by the driver on self-sevice kiosk or by staff. |
| | 2 Leading / unleading process |
| B | 3. Loading / unloading process After activation of loading schedule the permissions for loading/unloading are sent to loading automats. The driver arrives at loading bay, connects to technological equipment and performs authentication on loading bay card reader. Loading / unloading process is performed. |
| | 4. Bill of loading (BOL) printing |
| | Transaction data are sent independently to custody transfer printer. This printouts can be used for audit purposes and as a backup of the electronic data. |
| | |
| | 5. Automatic saving of transaction data The complete set of transaction data including information about additivation and blending are automatically stored in the TAMAS database. The data are stored automatically in the database after finish of each transaction. |
| | |
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6. Delivery notes creation

- After loading is finished, the staff can save and print delivery notes.
- The documents can be saved and printed automatically or by staff.
 - Optionaly the transaction data are exported into 3rd party systems.



7. Departure

- The driver receives the delivery notes.
- The driver performs check-out, security control and leaves the terminal.

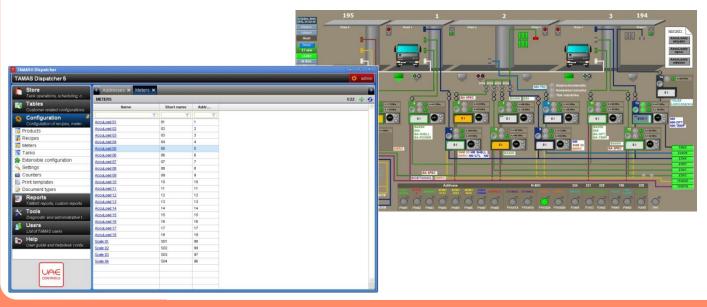
PROFESSIONAL SOLUTIONS FOR OIL&GAS AND WATER INDUSTRY

ADMINISTRATION TAMAS®

Terminal Automation, Management And Administration System

Key advantages of TAMAS[®] MES solution

- Tailor-made solution for each application
- User-friendly interface
- Enable fully automated loading/unloading process in relation with other TAMAS[®] components
- Availability of all technology data (volume, volume @ 15°C, mass, density, temperature, total counters, components and concentrations)
- Vehicles / drivers / products identification
- Transport information
- Sales orders database
- Loading / unloading planning
- Integration with flowmeters and presets
- Documents print and export
- User configuration of tanks, products, flowmeters, cards, transport companies, drivers etc.

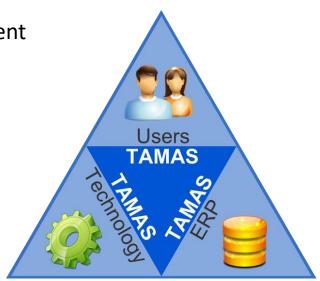


VAE CONTROLS GROUP INTEGRATION & ARCHITECTURE TAMAS®

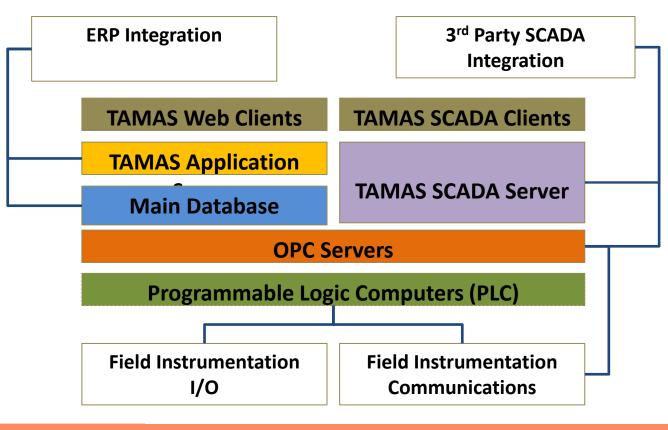
Terminal Automation, Management And Administration System

TAMAS Integration

- Tank Operations Management
 & Dispatching
- Configuration
- Automation
- SCADA
- Reporting
- 3rd party systems
 - Field Instrumentation
 - ERP
 - 3rd party SCADA



TAMAS Architecture



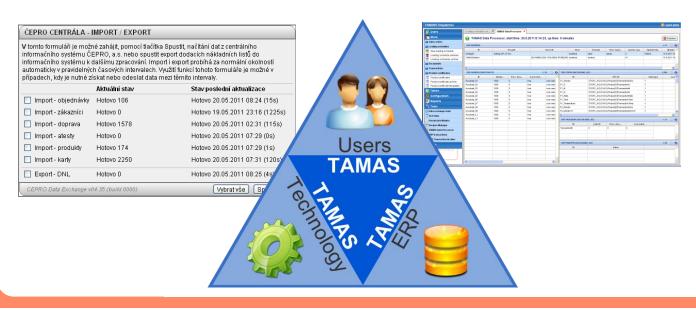
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VAE CONTROLS GROUP 3-RD PARTY SYSTEMS TAMAS®

Terminal Automation, Management And Administration System

TAMAS is open for communication and data exchange with 3rd party systems over standard and tailor-made interfaces:

- Client's ERP
 - Sales orders or tank operation plans
 - Tank operations data export
 - Customer related data synchronization
 - Transport related data synchronization
- Field instrumentation
 - Flow meters integration
 - Tank gauging system integration
 - ID system integration
 - Signal level integration
- 3rd party systems
 - SCADA
 - OPC servers
 - Specialized information systems



PROFESSIONAL SOLUTIONS FOR OIL&GAS AND WATER INDUSTRY

VAE CONTROLS GROUP EXTENSIBILITY & SECURITY TAMAS®

Terminal Automation, Management And Administration System

Extensibility

Thanks to its modular design, TAMAS can be extended at any phase of operation in any direction:

- Automated control changes
- Devices connected
- Reports, printouts, visualisation
- Products, recipes
- 3-rd party systems data exchange



Security

TAMAS provides high level of operational security thanks to:

- Username / password authentication
- Optional Smart cards or USB tokens authentication
- Possibility to dedicate server
- Configurable user roles
- Optional ID System for tank operations

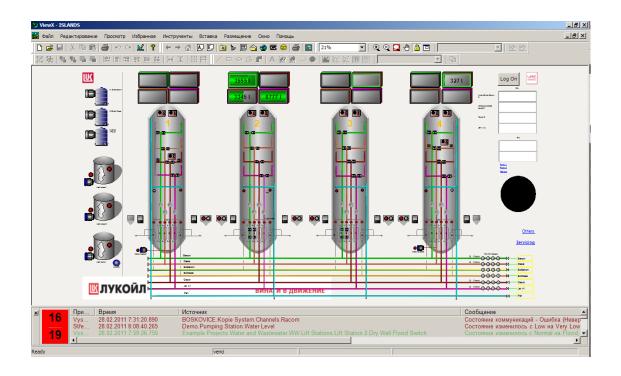


Terminal Automation, Management And Administration System

SCADA – Supervisory, Control And Data Acquisition Main features

Using advanced solutions of SCADA systems TAMAS has extremely wide ability of:

- Visualisation and "one-click" control of field instruments
- Advanced alarms and events handling including sending alarm messages to e-mails and over SMS
- Wide possibilities of reporting
- Graphs, charts, treds of all measured values
- Forecatsing
- Development environment included in server license
- Full clients and web clients



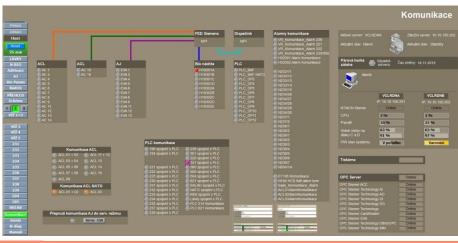
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Terminal Automation, Management And Administration System

SCADA – Supervisory, Control And Data Acquisition Technical characteristics

TAMAS[®] SCADA uses latest technology to ensure highest possible level of stability, reliability and security:

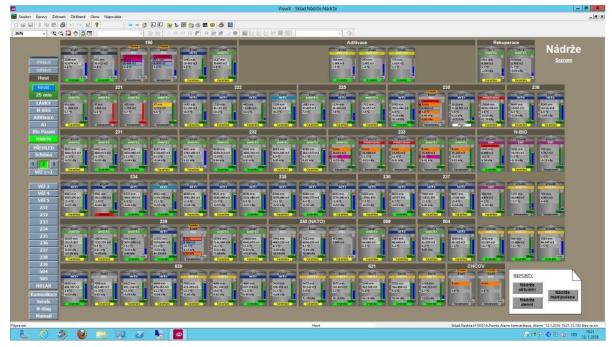
- High level of security thanks to username / password access protection
- Multiple levels of user rights for different operations
- Integrated logging functionality
- Client Server architecture
- Optional hot-standby servers
- Support for RAID harddisc clusters
- Support for centralised data archiving systems
- Support for servers virtualisation
- Local or remote clients
- OPC support
- Remote diagnostics and modifications for minimum service costs)



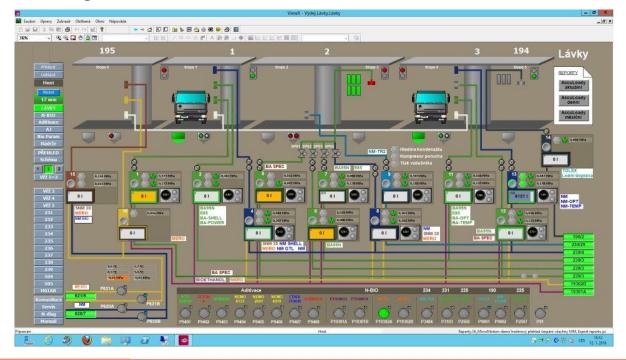
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VISUALISATION EXAMPLES

Tankfarm main data overview



Loading islands overview



PROFESSIONAL SOLUTIONS FOR OIL&GAS AND WATER INDUSTRY

Terminal Automation, Management And Administration System

VISUALISATION EXAMPLES – CHART VIEW

Flowmeters data and diagnostics

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| | Alarm "25-ÚNO-2009 05:33 | | | | | | <u></u> | UŽIVATEL : X |

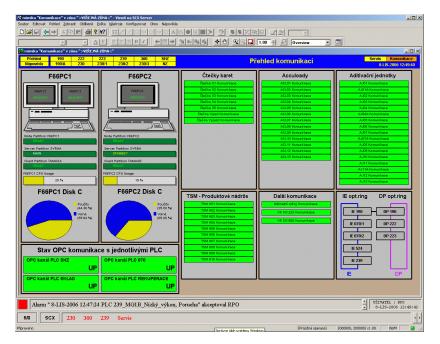
Loading islands main data overview

| Mimic "Top Leading Island 1" on Zone ">WORLD_ZONE<" : Unnamed - ViewX on SCX Server File Edk View Display Favourkes Mail Tools Configure Settings Insert Arrange Dynamics Window Help | | | | | | | | |
|---|---|----------------------------------|--|----------------------------------|--|------------|--|--|
| | | | | | | | | |
| Mimic "Top Loading Island 1" on Zone ">WORLD_ZONE<": Unnamed | | | | | | | | |
| Top Loading Isla | nd 1 T | erminal Top Loadi | ng 1 Top Loading | 2 Bottom Loading | Tanks Se | ervice | | |
| 3 - | | 4 - | | 5 - | | | | |
| Arm: 0K | Ready Loading | | ady Loading | Arm: 0K Re Volume | ady Loading | | | |
| Volume | 0 I Communication alarm | Volume 0 I | Communication starm | 01 | Communication alarm | | | |
| Flow rate 0 I | Sum of alarms Accept DA CM PP SP MA HF LF Imin HT LT TP DA ZF VF PS | | Sum of alarms Accept DA CH PP SP NA HF LF HT LT TP DA ZF VF PS | Flow rate 0 I/min | Sum of alarms Accept DA CM PP SP MA HF LF HT LT TP DA ZF VF PS | | | |
| Total G | Transaction G | Total G | Transaction G | Total G | Transaction G | | | |
| Total N | Transaction N | Total N | Transaction N | Total N | Transaction N | | | |
| Total M | Transaction M O kg O kg | Total M O kg | Transaction M O kg | Total M O kg | Transaction M O kg | | | |
| Current Temperature | Transaction Temperature 0 °C 0.0 °C | Current Temperature 0.0 °C | Transaction Temperature 0.0 °C | Current Temperature 0.0 °C | Transaction Temperature 0.0 °C | | | |
| Current Density 887.0 kc | Transaction Density /m3 886.0 kg/m3 | Current Density 887.0 kg/m3 | Transaction Density 886.0 kg/m3 | Current Density 887.0 kg/m3 | Transaction Density 886.0 kg/m3 | | | |
| Current Card | Transaction Card | Current Card | Transaction Card | Current Card | Transaction Card | | | |
| Current Product2 | Transaction Product2 | Current Product2 | Transaction Product2 | Current Product2 | Transaction Product2 | | | |
| Tank | Transaction ID mpty D | Tank Empty | Transaction ID O | Tank Empty | Transaction ID O | | | |
| Reference Density 888.0 kg | Transaction Time | Reference Density 888.0 kg/m3 | Transaction Time 27072004 4444 | Reference Density 888.0 kg/m3 | Transaction Time 27072004 5555 | | | |
| ObjeX "MLO_MI | ЛСS" deleted by ЛКU | | | | ▲ USER : JKU ▼ 6-AUG-2004 | 4 09:23:24 | | |
| 24/4 SCX No | Mimic-No View Bot | tom Loading Servi | ce Top Loading I | Island 2 Top Load | ling Island 1 | • • | | |
| Ready | | | | (No Operation) (000 | , , , , , , , , , , , , , , , , , | NUM 🧕 | | |
| 🐉 start 🛛 🔇 SCX Mana | ger - Partiti 🔇 🍪 Mimic "Top L | .oading Isl 🦉 lavky.bmp | - Paint | | ©®\$\$ | no 🔁 09:23 | | |

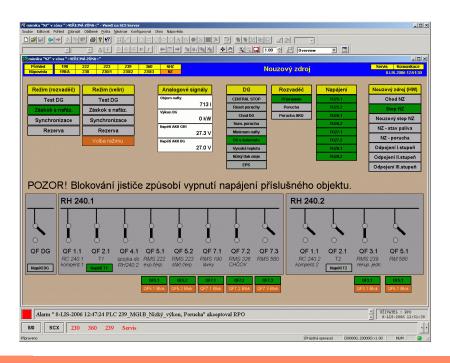
Terminal Automation, Management And Administration System

VISUALISATION EXAMPLES - DIAGNOSTICS

Field instrumetation, communication and HMI status



Emergency power supply system status



Terminal Automation, Management And Administration System

TAMAS has highly advanced possibilities for reporting :

- TAMAS Dispatcher reports
 - Build-in reports
 - Loading / unloading transactions
 - Loading / unloading summary with data from total counters
 - Bio and additives reports
 - Documents inventory reports
 - Client-defined reports
 - 3rd party clients reports
 - Shift turnover report
 - List of operations per period
- SCADA reports

. . .

- Tanks
- •Meters
- •Customer reports

| | 07 | |
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| | 08 | |
| | 09 | Dyzel |
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| Construction C | UAB "LUKOIL BALTIJA" filialas KÉDAINIŲ KURO BAZĖ Zbuoklių g. 22, LT-57128 K-dainai. įmonės kodas 11044713. Tel. (8-347) 67050 KOKYEĖS PAŽYMĖJIMAS forceneticy jaukais in tradicionality in territoria in territa in territoria in territoria in territoria in | |
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| Period | May 17, 2011 12:00 AM - May 20, 2011 11:59 PM | | | | | | | | | | | |
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| Meter | Product | Vol | ume | Mass | Mass Total volume | | | | Total volume 15 | | | |
| | | | | | | | | Divergence | | | | Divergence |
| 01 | Dyzelinas | 17,123 | 17,095 | 14,384 | 34,798,268 | 34,815,391 | 17,123 | 0 | 35,015,909 | 35,033,005 | 17,096 | -1 |
| 01 | RRME | 883 | 881 | 778 | 276,978 | 277,879 | 901 | -18 | 277,171 | 278,071 | 900 | -19 |
| 02 | | | | | | | 0 | 0 | | | 0 | 0 |
| 03 | Dyzelinas | 35,077 | 35,050 | 29,427 | 294,043,734 | 294,078,812 | 35,078 | -1 | 294,987,302 | 295,022,351 | 35,049 | 1 |
| 03 | RRME | 1,816 | 1,820 | 1,608 | 9,150,850 | 9,152,668 | 1,818 | -2 | 9,152,434 | 9,154,254 | 1,820 | 0 |
| 04 | | | | | | | 0 | 0 | | | 0 | 0 |
| 05 | Dyzelinas | 30,513 | 30,527 | 25,522 | 244,241,311 | 244,271,825 | 30,514 | -1 | 244,878,716 | 244,909,243 | 30,527 | 0 |
| 05 | RRME | 1,572 | 1,575 | 1,390 | 7,060,415 | 7,061,988 | 1,573 | -1 | 7,064,618 | 7,066,193 | 1,575 | 0 |
| 06 | Benzinas | 1,903 | 1,915 | 1,423 | 293,368,080 | 293,369,984 | 1,904 | -1 | 295,381,789 | 295,383,704 | 1,915 | 0 |
| 06 | Etanolis | 98 | 98 | 78 | 2,034,280 | 2,034,378 | 98 | 0 | 2,051,627 | 2,051,725 | 98 | 0 |
| 07 | | | | | | | 0 | 0 | | | 0 | 0 |
| 08 | | | | | | | 0 | 0 | | | 0 | 0 |
| 09 | Dyzelinas | 62,171 | 62,120 | 52,146 | 229,164,529 | 229,226,702 | 62,173 | -2 | 230,184,859 | 230,246,980 | 62,121 | -1 |
| 09 | RRME | 2,979 | 2,982 | 2,635 | 8,077,198 | 8,080,181 | 2,983 | -4 | 8,081,192 | 8,084,176 | 2,984 | -2 |
| 12 | SND | 73,273 | 74,063 | 38,854 | 36,080,695 | 36,153,970 | 73,275 | -2 | 36,547,897 | 36,621,961 | 74,064 | -1 |
| 13 | SND | 37,934 | 38,050 | 20,208 | 35,274,736 | 35,312,669 | 37,933 | 1 | 35,787,884 | 35,825,934 | 38,050 | 0 |

Terminal Automation, Management And Administration System

ČEPRO (CZ)

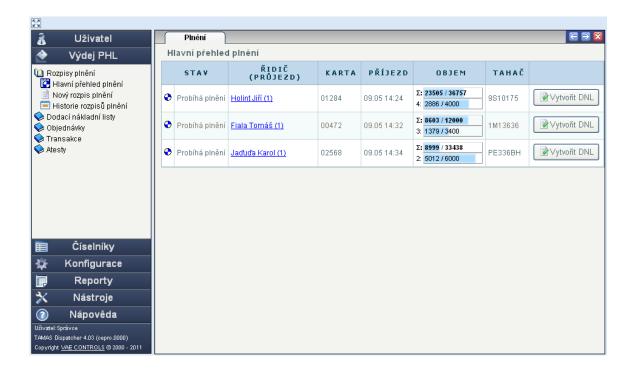
- Group of 16 tank farms
 - 12 automated tank farms
 - 2 tank farms without automation
 - 2 virtual tank farms
 - dedicated headquater in Prague
- Railway tankers loading/unloading
- Road tankers loading
- Tank gauging systém
- Additivation and blending support
- Pipeline transport
- Pump station
- VRU



Terminal Automation, Management And Administration System

ČEPRO (CZ)

- TAMAS dispatching with possibillity of manual inputs
- TAMAS SCADA
- PLC automation
- Self-service kiosks for drivers
- Smart card drivers authentication
- Integration with S.A.P.
- Integration with central ordering system M.A.R.S.
- Tank reporting
- Loading/unloading reporting
- Inventory reporting



PROFESSIONAL SOLUTIONS FOR OIL&GAS AND WATER INDUSTRY

Terminal Automation, Management And Administration System

INA Rijeka (HR)

- Tank truck terminal for lingt and heavy products
- Complete administration of tanktrucks movement inside terminal
- Self service kiosks for drivers
- Weighting
- Visualisation
- Data exchange with SAP
- Additives and blending support
- LPG (weighting)



PROFESSIONAL SOLUTIONS FOR OIL&GAS AND WATER INDUSTRY

Terminal Automation, Management And Administration System

LUKOIL Baltija (LT)

- Automated tank farm
- Road tankers terminal
- Not automated railway terminal
- Additives and blending support
- LPG



Terminal Automation, Management And Administration System

LUKOIL Baltija (LT)

- TAMAS dispatching
- TAMAS SCADA
- PLC automation
- Tank operations management
- ID card driver authentication
- Integration with local accounting systems
- Integration with WinDMS
- Inventory reporting
- Fuel accounting reporting

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PROFESSIONAL SOLUTIONS FOR OIL&GAS AND WATER INDUSTRY

Terminal Automation, Management And Administration System

ZSSK Cargo (SK)

- Wide-EU railway transfer terminal for dangerous liquid cargo
- 2 wide tracks and 2 EU tracks
- Simultaneous loading/unloading of 8 railway tankers



PROFESSIONAL SOLUTIONS FOR OIL&GAS AND WATER INDUSTRY

Terminal Automation, Management And Administration System

ZSSK Cargo (SK)

- TAMAS Dispatching
 - Transfer planning with recalculation from source tankers to target tankers
- TAMAS SCADA
- PLC automation
- Integration with railway scales
- Integration with ERP



PROFESSIONAL SOLUTIONS FOR OIL&GAS AND WATER INDUSTRY

Terminal Automation, Management And Administration System

Vaclav Havel Airport Prague (CZ)

- Tank farm for JET-A1
- Railway unloding terminal
- Runway tanktruck loading terminal



Terminal Automation, Management And Administration System

Vaclav Havel Airport Prague (CZ)

- Fully automated loading into runway road tankers incl. delivery notes printing
- Fully automated unloading from railway tankers incl. intake document printing
- Inventory reports for product owners
- SCADA



CERTIFICATES VAE CONTROLS GROUP

Terminal Automation, Management And Administration System

Certificates

- ISO 9001:2015 Quality management
- ISO 10006:2004 Project management
- ISO 14001:2015 Environmental management
- ISO 18001:2007 Occupational health and safety management
- ISO 27001: 2013 Information security management
- Confidential security clearance



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Front desk: +420 556 204 111 Commerce: <u>obchod@vaecontrols.cz</u> Web: <u>www.vaecontrols.com</u>

| 07/06/2013: VAE CONTROL | S 20 SENIS IN BUSINESS |
|--|---|
| OIL & GAS | WATER SUPPLY |
| VAE CONTROLS® designs and implements comprehensive supplies of technologies and control systems for thet and crude-oil product storages and terminals. | VAE CONTROLS® focuses on the central control centers for distribution of dirinking water and sever networks and local water-supply systems of control objects. |
| Re/Construction of tankfarms and terminals for petroleum products Terminal control and administration system TAMAS® Electronics for explosion-risk environment | Control of Water-Supply and Severage Networks Control Systems for Water Treatment and Wasie Water Treatment Plants SCX SCADA WAMAS telemetry systems |
| | EPCC SERVICES |
| VAE CONTROLS® manufacture electronic devices mainly for industrial applications and machinery. We specialized expectally on the products designed for explosion-risk environment. | VAE CONTROLS @ provides customers with of a strong design, development and implementation environment with the option of financing individual projects and top know-how in focused fields. |
| Industrial electronics and Precision engineering Professional electrical technology assembly works Environmental services, comprehensive biogae station supplies | Turn key deliveries of technological units Design and engineering services Control SW for local real time technological processes |
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| VAE CONTROLS GROUP - TURN KEY CONTRACTOR FOR PETR | |
| A NEW ERA OF MONITORING 14/12/2015 Article *A NEW ERA OF MONITORING* was published in issue 12 / 2015 of the magazine World Pipelines. It includes information about history of control systems, describes costs optimisation based. | VAE CONTROLS - expertise in fuel storage construction and control of water supply systems. e-brochure |
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PROFESSIONAL SOLUTIONS FOR OIL&GAS AND WATER INDUSTRY