



SIUR console

for petrol stations and storage depots

Technical guide

Revision: R2

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PURPOSE OF THE DOCUMENT

This Technical Guide is intended for studying of SIUR console for petrol stations and storage depots. It contains basic information regarding its:

- technical characteristics
- operation
- configuration

Information regarding connection to specific ATG systems and fuel dispensers and correspondent configuration of SIUR console can be received upon request to Technotrade LLC company.

Due to a reason that SIUR console firmware is constantly being developed in direction of improvement of its possibilities, changes are possible in final version, which are not described in given Technical Guide.

During the system development process given Technical Guide is also expanded and updated and new chapters are added. Latest version of this Technical Guide can be downloaded from the SIUR console web-page: <http://technotrade.ua/tank-monitoring-system.html>.

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In case if you find any mistakes, omissions in this document or have any suggestions on improvements to this document, please feel free to e-mail them to our support mailbox: support_1a@technotrade.ua. We will be grateful to you for this valuable information.

All technical questions regarding the SIUR console are welcome to be asked on support mailbox: support_1a@technotrade.ua. Our support team will be glad to help you.

Also, you can call to us or visit us on:

Technotrade LLC

Ukraine, 04114 Kiev, Priorska str. 10, office 1

Tel: +38-044-502-46-55, +38-044-502-46-77

Web: www.technotrade.ua

Mail: mail@technotrade.ua

SAFETY MEASURES

To reduce the risk of possible injury, electric shock, fire or damage to equipment, the following precautions should be observed when using the SIUR Console:

1. Before setting up and using the SIUR console please read this document carefully.
2. SIUR console should only be installed by qualified service engineers trained by the Manufacturer.
3. Manufacturer is not responsible for possible operations not indicated in this manual.
4. If any malfunction or error occurs with the SIUR console contact authorized service personnel or directly contact the Manufacturer.
5. Manufacturer refuses to be held liable for any possible injury to people and / or damage to equipment that occurs due to non-compliance with safety rules.
6. Personnel installing and using the SIUR console must be familiar with all safety regulations regarding this equipment.
7. In case of doubts regarding operation of the SIUR console contact authorized service personnel or directly contact the Manufacturer.
8. External intervention in construction of the SIUR console releases the Manufacturer from any liability to the competent authorities.
9. The SIUR console can be connected to level probes installed in fuel tanks in explosive dangerous areas where there is a possible risk of explosion and fire. Connection of level probes marked with explosion protection “intrinsically safe circuit” MUST be made through spark protection barriers that have a certificate, which meets requirements of these level probe. Connection of level probes marked with explosion protection “explosion-proof enclosure” in explosive dangerous zone MUST be made by means of armored cable.
10. When connecting the SIUR Console to fuel dispensers, loading risers of tank farms, level measuring systems, level probes and other devices, it is MANDATORY to comply with all safety rules and requirements given in the manuals for these devices.
11. SIUR Console is powered from 110-230 V AC lines. To avoid electric shock do not open and do not keep opened the casing of SIUR console during operation.
12. Power line of the SIUR console must contain an earthing wire that complies with the requirements set out in the Electrical Installation Rules.

APPOINTMENT

SIUR console is appointed for:

- monitoring of remains of fuel in tanks and their parameters in tanks of petrol stations and storage depots using level measurement systems and probes of various manufacturers
- control and monitoring over fuel dispensers, flowmeters of risers and petroleum products metering units at petrol stations and storage depots in dynamic mode
- temperature correction of petroleum products volume to 15 °C (when equipped with a TVC temperature correction device)
- tanks reconciliation
- sending notifications to user
- sending of accumulated data to central server for consolidated reporting

SIUR console provides control over dispensers (fuel, LPG, CNG) through built-in PTS forecourt controller. SIUR console when equipped with a TVC temperature correction device is able to calculate temperature-compensated volume at 15°C.

At connection to ATG systems/probes SIUR console provides registration, displaying and saving of following parameters (depending on used ATG system/probes):

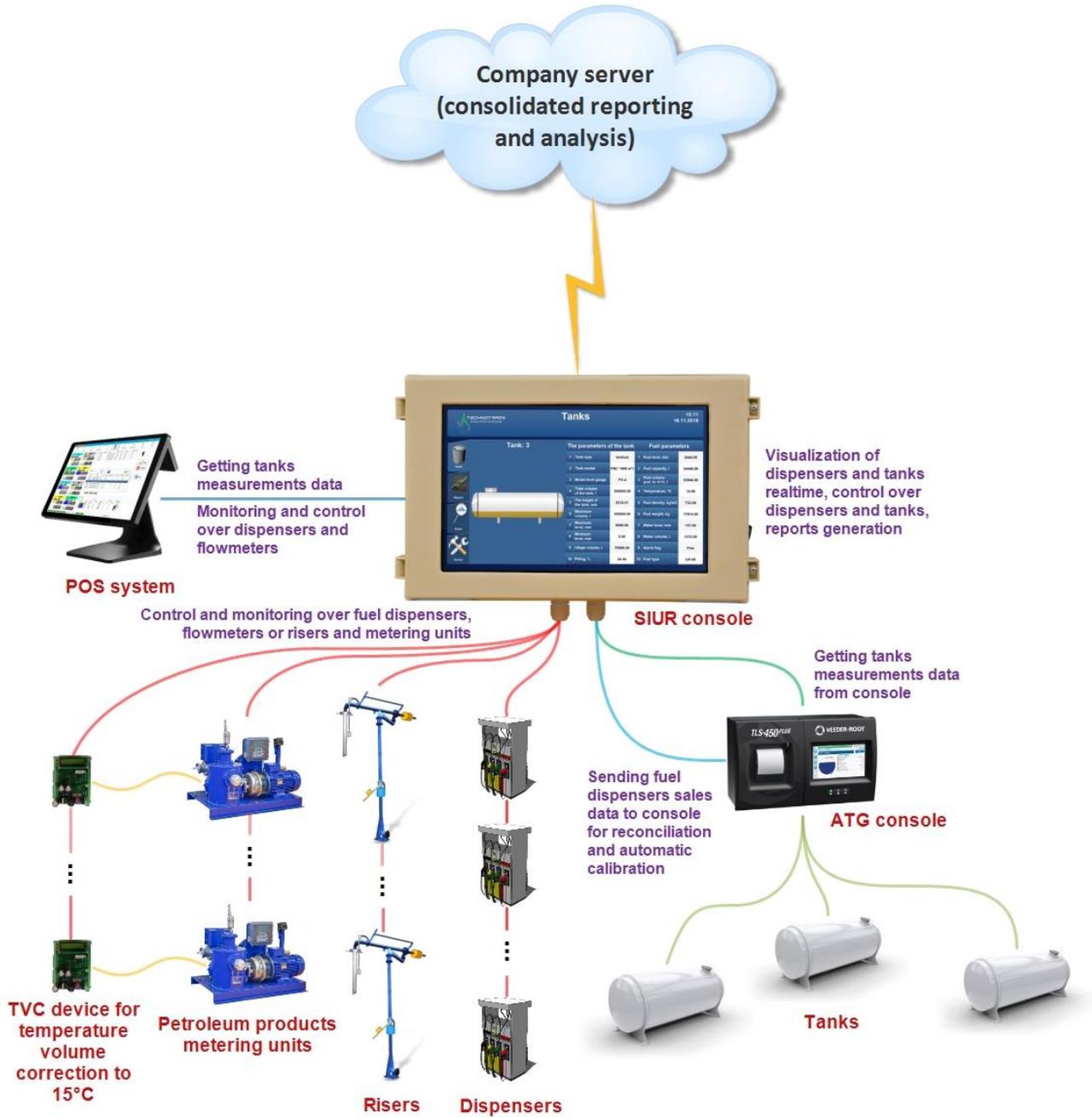
- product level
- product volume
- product temperature
- product ullage
- product temperature compensated volume
- product density
- product mass
- underproduct water level
- underproduct water volume
- tank leakage

Information on product/water volume can be taken directly from used ATG system, SIUR console can also provide calculation of volume based on product/water level, for this tanks' calibration charts should be input in the SIUR console.

SIUR console has built-in reports and charts, there are many parameters for flexible adjustments.

SIUR console automatically detects in-tank deliveries, report for in-tank deliveries can be generated.

SIUR console can be configured to automatically send reports to a remote server for formation of consolidated reports from several petrol stations or storage depots.



General scheme of connections

FUNCTIONS

- Control over dispensers (fuel, LPG, CNG) of various brands and models
- Monitoring over fillings made by dispensers, flowmeters of risers and metering units in dynamic mode, online visualization of fillings on screen
- Monitoring over ATG systems and probes of various brands and models, online visualization of measured parameters in screen
- Provision of tanks' calibration charts and calculation of product volume
- Automatic registration of in-tank deliveries and fillings of tanks
- Automatic registration of temperature changes in tank
- Generation of reports and charts
- Automatic sending of reports to a remote server for consolidated reporting from several petrol stations and storage depots
- Automatic sending of reports to emails of users
- Automatic signalization at emergency cases
- Automatic calculation of temperature-compensated volume at 15°C when equipped with a TVC temperature correction device
- Remote firmware update and configuration

TECHNICAL SPECIFICATION

##	PARAMETER	VALUE
1	Maximal number of connected dispensers and flowmeters	16 (up to 50 in extended version)
2	Maximal number of connected ATG probes in tanks	16 (up to 50 in extended version)
3	Communication interfaces with dispensers and flowmeters	4 x RS-485 (for dispensers with other interfaces connection is done through specialized interface converters)
4	Communication interfaces with ATG systems and probes	2 x RS-232, 1 x RS-485
5	Display	IPS display 10.1" with capacitive touchscreen
6	Voltage	220 V AC
7	Maximal current consumption	1 A
8	Temperature range	-20°C ÷ +60°C
9	Protection class	IP54
10	Weight	Up to 2 kg
11	Overall dimensions	315 x 215 x 85 mm

CONNECTION TO DISPENSERS AND ATG SYSTEMS

SIUR console provides connection to dispensers, flowmeters of risers and metering units and also to ATG systems and probes. Information on connection to any model can be received upon request to Manufacturer or from documentation.

List of supported dispensers

- | | | |
|---------------------------|-------------------------------------|--------------------------------------|
| 1. 2A | 47. GILBARCO | 93. PETROEQUIP |
| 2. ACTRONIC | 48. GREENFIELD | 94. PETROMECCANICA |
| 3. ADAST (ADAMOV SYSTEMS) | 49. HAKO | 95. PETROTEC |
| 4. AG WALKER | 50. HITACHI | 96. PROWALCO |
| 5. AGIRA | 51. HONG YANG | 97. PUMP CONTROL |
| 6. ANGI International | 52. IFSF (dispensers) | 98. PUMPTRONICS |
| 7. ARIEL | 53. IMW | 99. REAL-TECH |
| 8. ASPRO | 54. INTERMECH | 100. RIX |
| 9. ASSYTECH | 55. IPT | 101. SAFE |
| 10. ASTRON | 56. JAPAN ENERJUMP | 102. SALZKOTTEN |
| 11. AZT | 57. JAPAN TECH | 103. SANKI |
| 12. BAILONG | 58. KAISAI | 104. SATAM EQUALIS S |
| 13. BARANSAY | 59. KALVACHA | 105. SAVEL |
| 14. BATCHEN | 60. KIEVNIIGAZ | 106. SEA BIRD |
| 15. BENNETT | 61. KOREA ENE | 107. SHELF |
| 16. BLUE SKY | 62. KPG-2 | 108. SCHEIDT&BACHMANN |
| 17. CENSTAR | 63. KRAUS | 109. SHIBATA |
| 18. CFT Clean Fuel | 64. KRIPFLOW | 110. SLAVUTICH |
| 19. CHANGLONG | 65. KWANGSHIN | 111. SOMO PETRO |
| 20. COMPAC | 66. LANFENG | 112. STABILIZING |
| 21. COPTRON | 67. LAFON | 113. STAR |
| 22. CORITEC | 68. LIQUID CONTROLS | 114. TATSUNO (JAPAN) |
| 23. DATIAN MACHINES | 69. LG ENE | 115. TATSUNO EUROPE
(FORMER BENC) |
| 24. DEM G. SPYRIDES | 70. LOGITRON | 116. TATTAN |
| 25. DEVELCO | 71. MAIDE | 117. TEKSER |
| 26. DIGITAL FLOW | 72. MASER | 118. TIGER |
| 27. DINT | 73. MEKSAN / WAYNE SU86 | 119. TOKHEIM |
| 28. DONG HWA PRIME | 74. MEKSER | 120. TOKHEIM INDIA |
| 29. DURULSAN | 75. MEPSAN | 121. TOKICO |
| 30. EAGLESTAR | 76. MIDCO | 122. TOMINAGA |
| 31. ECOTEC | 77. MIDCOM | 123. TOPAZ |
| 32. EHAD | 78. MITHRA FUELING | 124. TOTAL CONTROL SYSTEMS |
| 33. EKOSIS | 79. MM PETRO (ZAP) | 125. TRANSPONDER |
| 34. EMGAZ DRAGON | 80. MOTOGAZ | 126. TRUE TECH |
| 35. EPCO | 81. MOUNTAIN CHINA | 127. UCAR ELEKTRIC |
| 36. ESIWELMA | 82. MRT | 128. UNICON-TIT |
| 37. EUROPUMP | 83. MS GAS | 129. VANZETTI |
| 38. FALCON LPG | 84. NARA | 130. WAYNE DRESSER |
| 39. FLOW | 85. NUOVA MIGAS | 131. WAYNE PIGNONE |
| 40. FORNOVO GAS | 86. NUOVO PIGNONE | 132. WELLDONE MACHINES |
| 41. FUELQUIP | 87. ONSUN | 133. WERTCO COMPANY TEC |
| 42. FUELSIS | 88. ORCA | 134. WINTEC ENERGY |
| 43. FUREN HIGHTECH | 89. PEC (GALLAGHER FUEL
SYSTEMS) | 135. YENEN |
| 44. GALILEO | 90. PECO | 136. ZCHENG GENUINE
MACHINES |
| 45. GASLIN | 91. PEGASUS | 137. ZHONGSHENG |
| 46. GERKON | 92. PETPOSAN | |

List of supported ATG systems and probes

- | | | |
|--------------------------|------------------------|--------------------------------|
| 1. ACCU | 19. HUMANENTEC | 37. QINGDAO GUIHE |
| 2. ALISONIC | 20. IFSF (ATG systems) | 38. RCS EPSILON |
| 3. ASSYTECH | 21. INCON | 39. RIKA |
| 4. BLUESKY | 22. KANGYU | 40. SENSOR |
| 5. CENSTAR | 23. KUNLUN | 41. SINOTECH |
| 6. DUT-E | 24. LABKO | 42. SKE LEVEL GAUGE |
| 7. EAGLESTAR | 25. LIGO | 43. START ITALIANA |
| 8. EBW | 26. MECHATRONICS | 44. STRUNA |
| 9. EMERSON ROSEMOUNT | 27. MEPSAN UNIMEP | 45. TECHNOTON |
| 10. ENRAF | 28. MTS ATG SENSORS | 46. TENET |
| 11. ESCORT FD | 29. ND | 47. UNIPROBE |
| 12. FAFNIR | 30. NORTH FALCON | 48. VEGA |
| 13. FRANKLIN FUELING | 31. O.L.E. | 49. VEPAMON |
| 14. GAMICOS | 32. OKET | 50. WINDBELL |
| 15. GILBARCO VEEDER ROOT | 33. OMNICOMM | 51. XT SENSORS |
| 16. HECTRONIC | 34. OMNTEC | 52. ZCHENG GENUINE
MACHINES |
| 17. HOLYKELL | 35. OPW | |
| 18. HONG YANG | 36. PHOENIX | |

USER INTERFACE

SIUR console user interface is made maximal simple and intuitive for easiness of operation. It is grouped into 4 sections:

- **Tanks** – displays configured tanks and their parameter grouped and individually
- **Колонки** – shows configured pumps (dispensers and flowmeters), allows to monitor fillings and also to make control with preset
- **Reports** – serves for generation of reports with filters selection
- **Сервис** – serves for configuration of SIUR console

Service section

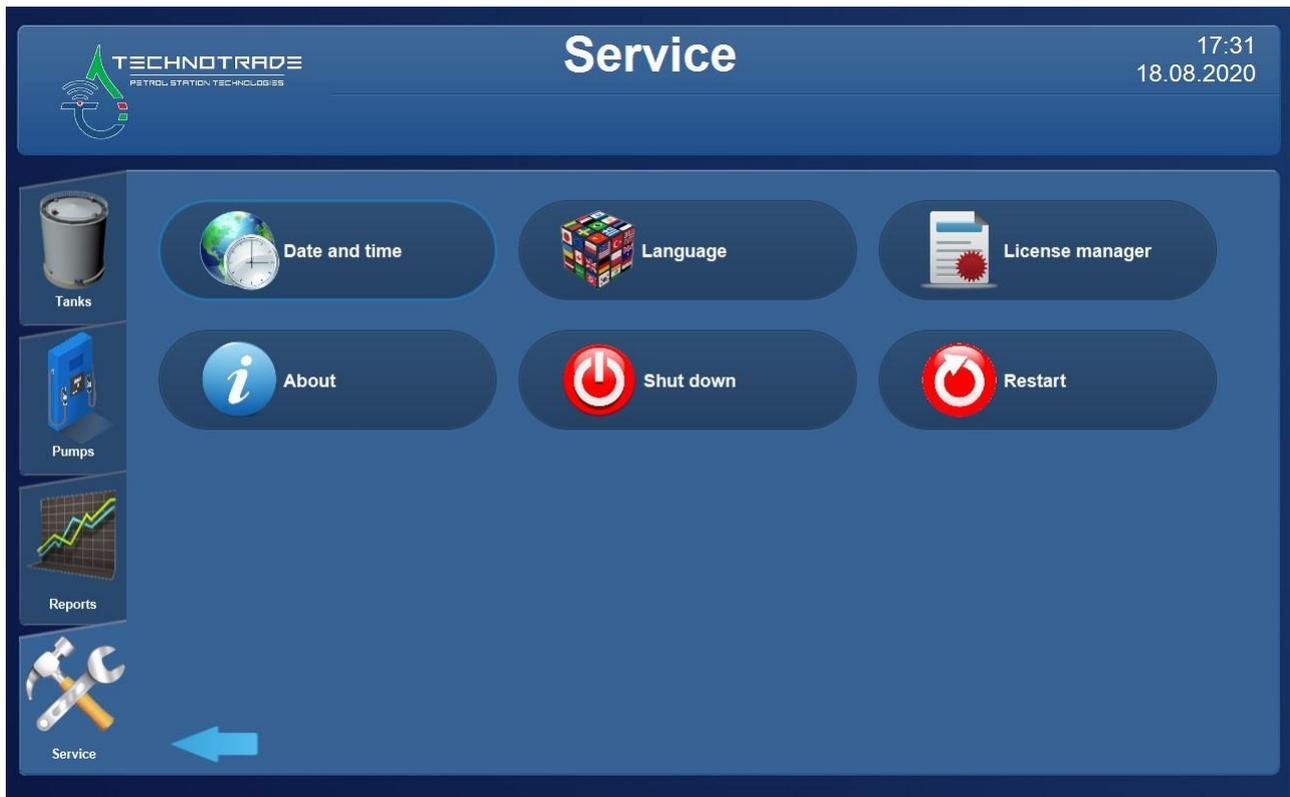
This section includes all settings for SIUR console operation.



Configuration of SIUR console includes the following subsections:

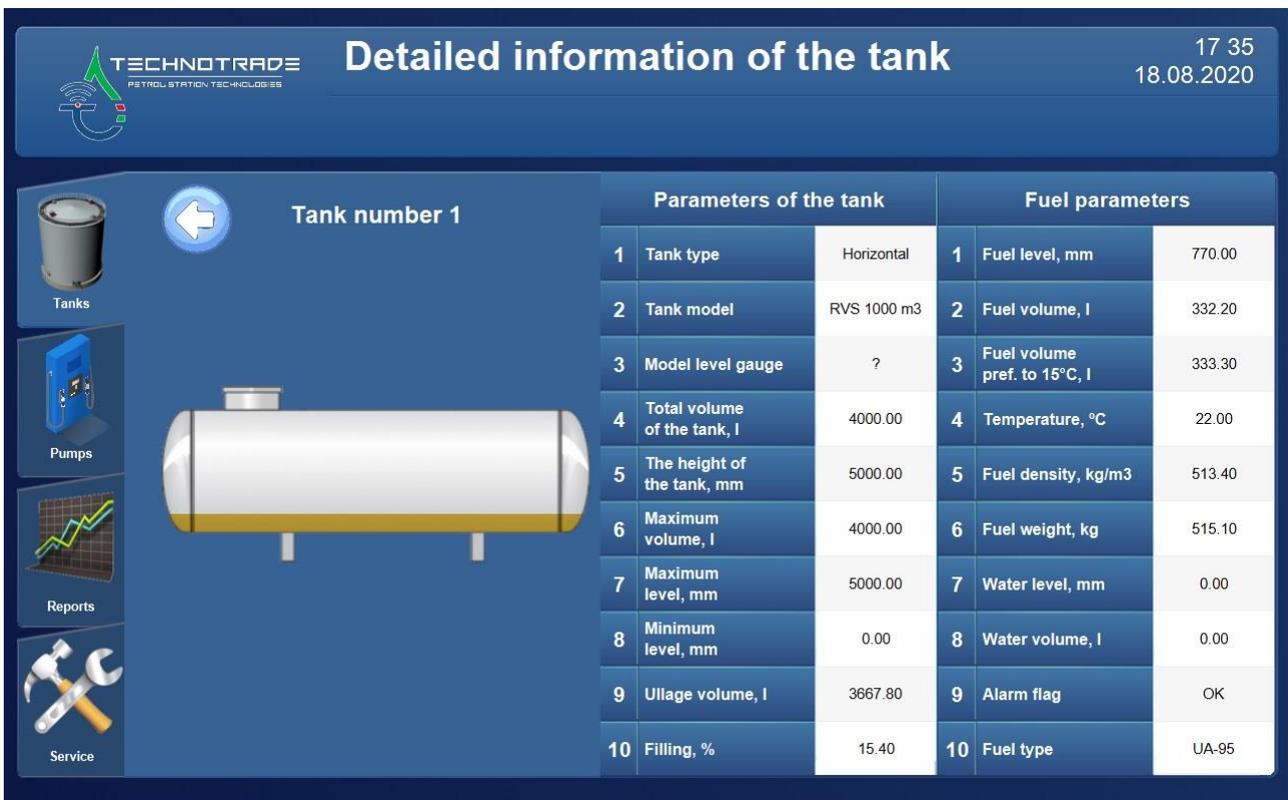
- **Site information** – serves for setting basic information about place of installation
- **Fuel grades** – serves for selection of fuel grades and prices
- **Tanks** – serves for configuration of tanks' parameters, selection of fuel grades, input of calibration charts, selection of displayed parameters, configuration of in-tank deliveries, others
- **Pumps** – serves for configuration of pumps' parameters, linking of nozzles to tanks and fuel grades, selection of operation modes, others
- **Channels of connection** – serves for selection of protocol for communication with connected equipment
- **Modbus** – serves for configuration of SIUR console operation with SCADA systems, where SIUR console works as a slave device
- **Contacts** – serves for configuration of contacts, to which automatic reports are to be sent to
- **Distribution of reports** – serves for selectin of data to be sent in reports to emails
- **Email** – serves for configuration of email box credentials, from which the reports are to be sent

- **Wi-Fi** – serves for configuration of wireless connection to LAN
- **Ethernet** – serves for configuration of wired connection to LAN
- **Remote server** – serves for configuration of automatic reports upload to remote server
- **Date and time** – serves for configuration of system date and time, selection of time zone
- **Language** – serves for selection of language for user interface
- **License manager** – serves for control over options installed in console license and adding new options
- **About** – serves for displaying current software version and Manufacturer information
- **Shutdown** – serves for console shutdown
- **Restart** – serves for console restart



Tanks section

Given section displays data on all tanks in grouped view. At this it is possible to select a specific tank and view detailed information about it.



SIUR console informs about emergency situations at following events:

- product level in tank exceeds the maximal allowed level set for the tank
- product level in tank becomes lower than the minimal allowed level set for the tank
- error of used ATG system or probe
- loss of communication with ATG system or probe

Pumps section

Given section displays data on all dispensers and flowmeters in grouped view.

The screenshot shows the 'Pumps' section of the SIUR console. The interface is dark blue with a white header. The header includes the 'TECHNOTRADE' logo and 'PETROL STATION TECHNOLOGIES' on the left, the title 'Pumps' in the center, and the time '17:36' and date '18.08.2020' on the right. On the left side, there is a vertical menu with icons for 'Tanks', 'Pumps', 'Reports', and 'Service'. The main area displays two pump status panels:

- 1 Nozzle is hang down:**
 - Amount: 00028560
 - Volume: 00001000
 - Volume 15°C: 00001200
 - Price: 002856
- 2 Nozzle is hang up: 1:**
 - Amount: 00006962
 - Volume: 00000247
 - Volume 15°C: 00000295
 - Price: 002856

At presence of option in SIUR console license for control over pumps then at selection of specific pump it is possible to provide control over it in the following modes:

- **Amount** – pump authorization for specific money amount
- **Volume** – pump authorization for specific volume
- **Full tank** – pump authorization without setting the dose
- **Start-Stop mode** – pump authorization is done automatically at taking up a nozzle

The screenshot shows the 'Pumps' section of the SIUR console with a control dialog for 'Pump number 2' overlaid. The dialog has a title bar with a close button (X) and a dropdown menu showing '1 - UA-95'. Below the dropdown are four tabs: 'Amount', 'Volume', 'Full tank', and 'Start-Stop mode'. The 'Volume' tab is selected, and a text input field contains the value '15.00'. Below the input field, the following information is displayed:

- Amount: 428,40 \$
- Volume: 15,00 l.
- Price: 28,56 \$

At the bottom of the dialog are two buttons: a green 'Start' button and a red 'Stop' button.

Reports section

Given section allows to generate reports and charts on operation with selection of filters.

Tank number	Ullage volume, l	Fuel level, mm	Fuel capacity, l	Fuel volume at 15°C, l	Fuel density, kg/m3	Ten	+
1	3667.8	770.0	332.2	333.3	513.4	22.0	
2	3634.58	847.0	365.42	366.63	564.74	22.2	
3	3601.36	924.0	398.64	399.96	616.08	22.4	
4	3568.14	1001.0	431.86	433.29	667.42	22.6	
5	3534.92	1078.0	465.08	466.62	718.76	22.8	
6	3501.7	1155.0	498.3	499.95	770.1	23.0	
7	3468.48	1232.0	531.52	533.28	821.44	23.2	
8	3435.26	1309.0	564.74	566.61	872.78	23.4	
9	3402.04	1386.0	597.96	599.94	924.12	23.6	
10	3368.82	1463.0	631.18	633.27	975.46	23.8	