PTS controller

over fuel dispensers and ATG systems

for petrol stations

Software Development Kit (SDK)

TECHNICAL GUIDE

(PTS controller PCB board modification: PTS-U2)

Review date: 12 Aug, 2012

“TECHNOTRADE LTD”

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PURPOSE OF THE DOCUMENT

This Technical Guide is intended for studying of PTS controller over fuel dispensers and ATG systems for petrol stations software development kit (SDK). It contains basic information regarding used hardware equipment and software application and tools supplied and used in PTS controller SDK structure.

Due to a reason that PTS controller firmware is constantly being developed in direction of improvements of its possibilities, new revisions of PTS controller are developed and manufactured, changes are possible in final version of the given Technical Guide, which are not described herein.

During the system development process given Technical Guide will be also expanded and updated and new chapters will be added. Latest version of this Technical Guide can be downloaded from the PTS controller web-page: http://www.technotrade.ua/fuel_pump_controller.html.

APPOINTMENT OF PTS CONTROLLER SDK

PTS controller over fuel dispensers and ATG systems for petrol stations is intended to be used in connection with a POS system or a cash register to provide simultaneous control over various types of electronic fuel delivery dispensers and automatic tank gauge systems (ATG systems) of various manufacturers using various proprietary communication protocols of manufacturers.

PTS controller SDK (Software Development Kit) is appointed on developers of POS software applications for petrol stations providing control over fuel dispensers and ATG systems through PTS controller.

PTS controller SDK allows developers to:

1. Study operation with the PTS controller.
2. Implement the PTS controller into own developed POS system or software application for control over fuel dispensers and ATG level measurement systems for petrol stations.
3. Debug own POS system or software application to work correctly with PTS controller by watching how NaftaPOS software provides it, implement the same behavior in own system.
4. Debug own software application to correctly provide control over various popular fuel dispensers locally (on the workplace) without a necessity to go to the petrol station and connect to real fuel dispensers using supplied with PTS SDK fuel dispensers software simulators, which simulate operation of various popular fuel dispensers. Through an interface converter RS-485 / RS-232, supplied together with PTS SDK, connect a PTS controller output RS-485 to a PC COM-port with fuel dispensers software simulators.

PTS SDK STRUCTURE

PTS controller SDK includes:

HARDWARE:

1. PTS controller over fuel dispensers and ATG systems for petrol stations - 1 pcs
2. Interface converter RS-485 / RS-232 - 1 pcs
3. USB software protection dongle Guardant (required for NaftaPOS software and fuel dispensers software simulators) - 1 pcs
4. Cabling

SOFTWARE:

1. NaftaPOS software for petrol stations – 1 license (protected by USB-dongle)
2. PumpDemo - free contracted version of NaftaPOS software for petrol stations
3. Software simulators of popular fuel dispensers
4. Software simulators of ATG systems (probes)
5. API for developers in various programming languages:
   - API for communication with PTS controller in C language with documentation under Windows and Linux operation systems
   - COM-object (with open source codes in Visual C++ 6.0) with methods and properties for communication with PTS controller and documentation to it
   - Open source application in Visual Basic 6.0 for control over fuel dispensers and ATG systems using COM-object
   - .NET library (with open source codes written in C#) for communication with PTS controller and documentation to it
   - Open source full-function application in C# language for provision of full control over fuel dispensers and ATG systems using .NET library
6. "All in one" configuration tool for configuration, firmware update, logging and diagnostics of the PTS controller
7. Useful tools for debugging of communication with PTS controller

PTS SDK TECHNICAL FEATURES

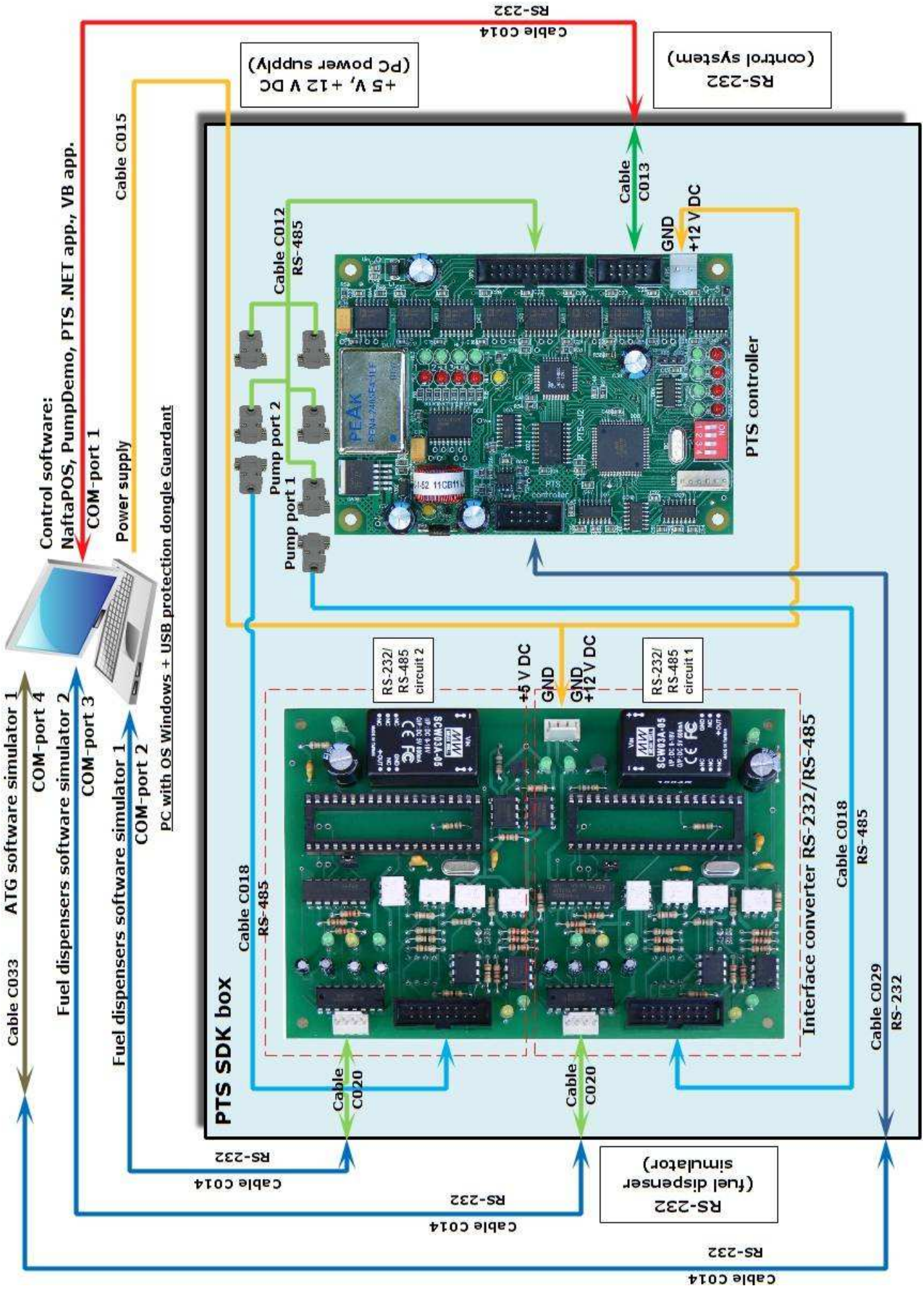
Specification:	
Voltage	+5 V, +12 V DC
Current consumption	450 mA max
Temperature range	-40°C ÷ +80°C
Weight	1500 g
Overall dimensions	240 x 200 x 100 mm

Communication ports:	
PC port	RS-232
Pump port	RS-232

Supported communication protocols:	
Input	UniPump (TECHNOTRADE LTD company private protocol)
Output	Currently present: Fuel dispensers communication protocols: 1. ADAST Easycall, 2. TiT UniPump, 3. WAYNE Dart, 4. MM Petro ZAP RS-485 , 5. GILBARCO Two-wire, 6. TOKHEIM Controller-Dispenser Communication protocol, 7. TATSUNO Benč PDE, 8. TATSUNO SS-LAN, 9. DEVELCO, 10. SAFE Graf, 11. GALILEO PumpControl GC21, 12. SLAVUTICH FD-Link 13. SB T10 AR 14. SHELF 15. TiT UniGaz 16. BATCHEN Email 17. PUMALAN Marconi 18. Korea EnE 19. BENNETT Current Loop 20. BENNETT RS-485 21. WAYNE USCL 22. NUOVO PIGNONE CL 23. PEC Gallagher 24. BLUE SKY 25. PROWALCO SPDC-1, MPDC-1 26. TOKICO SS-LAN 27. SANKI ATG systems communication protocols: 1. GILBARCO Veeder Root 2. START ITALIANA SMT-XMT 3. PETROVEND4 4. STRUNA Kedr spec. 1.4 5. FAFNIR VISY-Quick 6. ASSYTECH 7. HECTRONIC HLS

	Quantity of communication protocols depends on firmware version of PTS controller.

PTS SDK STRUCTURE



PTS SDK box includes 2 boards mounted inside of a plastic case (PTS controller board and RS-232/RS-485 interface converter board) and all required cablings for power supply and communication of these boards.

PTS controller board serves for organization of communication with fuel dispensers and ATG systems. Control software supplied together with PTS SDK (NaftaPOS software, PumpDemo, PTS .NET application, VB test application) or self-developed POS system software, which uses UniPump communication protocol for communication with PTS controller (or its API, COM-object, .dlls, etc for this matter) provide control over PTS controller through a COM-port, to which PTS controller is connected through cable C013. PTS controller pump port using connectors of its cable C012 is connected with fuel dispensers.

RS-232/RS-485 interface converter board serves for connecting of PTS controller pump channels (in RS-485 interface) with COM-port of PC (in RS-232 interface), where fuel dispensers simulators are to be launched. RS-232/RS-485 interface converter board has 2 independent conversion circuits, so it is possible to simultaneously connect 2 fuel dispensers simulators to PTS controller pump channels using the same RS-232/RS-485 interface converter board. Using cables C018 the RS-232/RS-485 interface converter board is connected to pump channels of PTS controller (connectors of cable C012).

For connection with ATG systems the PTS controller has a cable C029, connectors of which are in RS-232 interface and can be directly connected with ATG systems or to COM-port of the PC (through cable C033), where ATG system software simulator is launched.

Cable C014 serves as a standard prolonger of RS-232 interface.

Thus it is possible to debug a correct operation of software, being developed, with the PTS controller without a necessity to connect to real fuel dispensers and ATG systems, but using fuel dispensers software simulators and ATG systems software simulators.

PTS CONTROLLER TECHNICAL FEATURES

Appointment

PTS controller over fuel dispensers and ATG systems for petrol stations is intended to be used in connection with a POS system or a cash register to provide simultaneous control over various types of electronic fuel delivery dispensers and automatic tank gauge systems (ATG systems) of various manufacturers using various proprietary communication protocols of manufacturers.

More technical information regarding PTS controller can be found in PTS controller technical guide on: http://www.technotrade.ua/fuel_pump_controller.html.

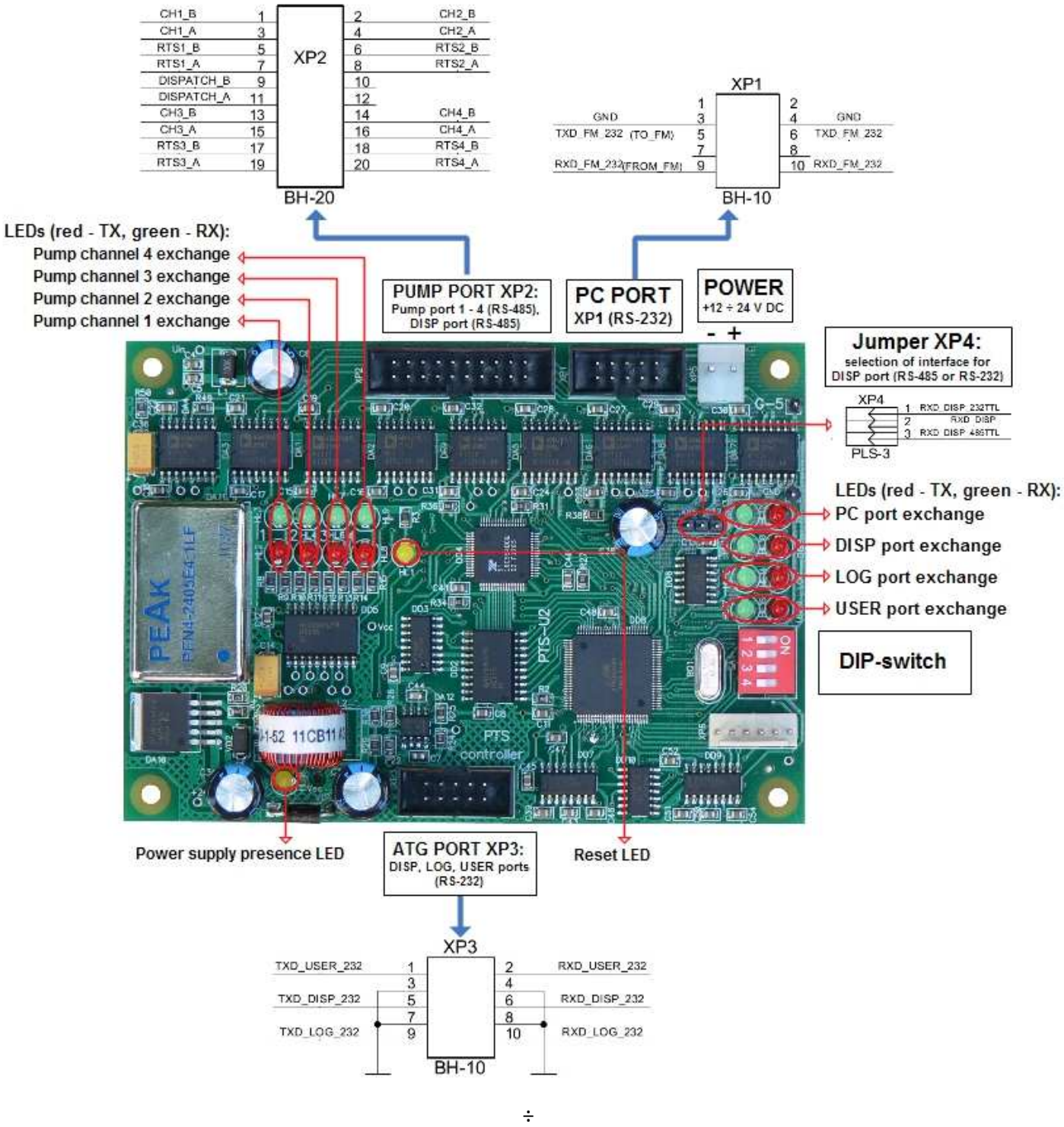
Specification

Power supply voltage	12 – 24 V DC
Current consumption	200 mA max
Temperature range	-40°C ÷ +80°C
Weight	120 g
Overall dimensions	120 x 85 x 20 mm

Communication ports

PORT NAME		INTERFACE	PURPOSE
PC PORT		RS-232	Connection with a personal computer (PC), a POS system or a cash register
PUMP PORT	**Pump port 1**	Optically isolated RS-485: 2 wires for lines A and B, 2 wires for RTS control	Connection with fuel dispensers using common communication protocol (up to 16 fuel dispensers)
	Pump port 2	Optically isolated RS-485: 2 wires for lines A and B, 2 wires for RTS control	Connection with fuel dispensers using common communication protocol (up to 16 fuel dispensers)
	Pump port 3	Optically isolated RS-485: 2 wires for lines A and B, 2 wires for RTS control	Connection with fuel dispensers using common communication protocol (up to 16 fuel dispensers)
	Pump port 4	Optically isolated RS-485: 2 wires for lines A and B, 2 wires for RTS control	Connection with fuel dispensers using common communication protocol (up to 16 fuel dispensers)
	DISP port (RS-485)	Optically isolated RS-485: 2 wires for lines A and B	1. PTS controllers interconnection for simultaneous control over the same fuel dispensers (up to 16 PTS controllers) and ATG systems 2. Connection with ATG systems (probes) using common communication protocol (up to 16 ATG probes)
ATG PORT	**DISP port (RS-232)**	RS-232	Connection with ATG system (console)
	LOG port	RS-232	1. Connection with ATG system (console) 2. Writing of operation log of PTS controller interaction with fuel dispensers, ATG systems, PTS interconnection
	USER port	RS-232	Connection with ATG system (console)

PTS CONTROLLER BOARD CONNECTORS AND INTERFACES



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NOTE! Jumper XP4 serves for selection of DISP channel interface between RS-485 and RS-232.

INTERFACE CONVERTER RS-232/RS-485 PURPOSE

Appointment

Interface converter RS-232 / RS-485 is used to convert signals of RS-232 interface into signals of RS-485 interface and backwards.

More technical information regarding interface converter RS-232/RS-485 can be found in technical guide on: http://www.technotrade.ua/rs232_to_rs485_converter.html.

Specification

Power supply voltage	+12 V DC, +5 V DC
Current consumption	250 mA max
Temperature range	0°C ÷ +40°C
Weight	120 g
Overall dimensions	145 x 100 x 20 mm

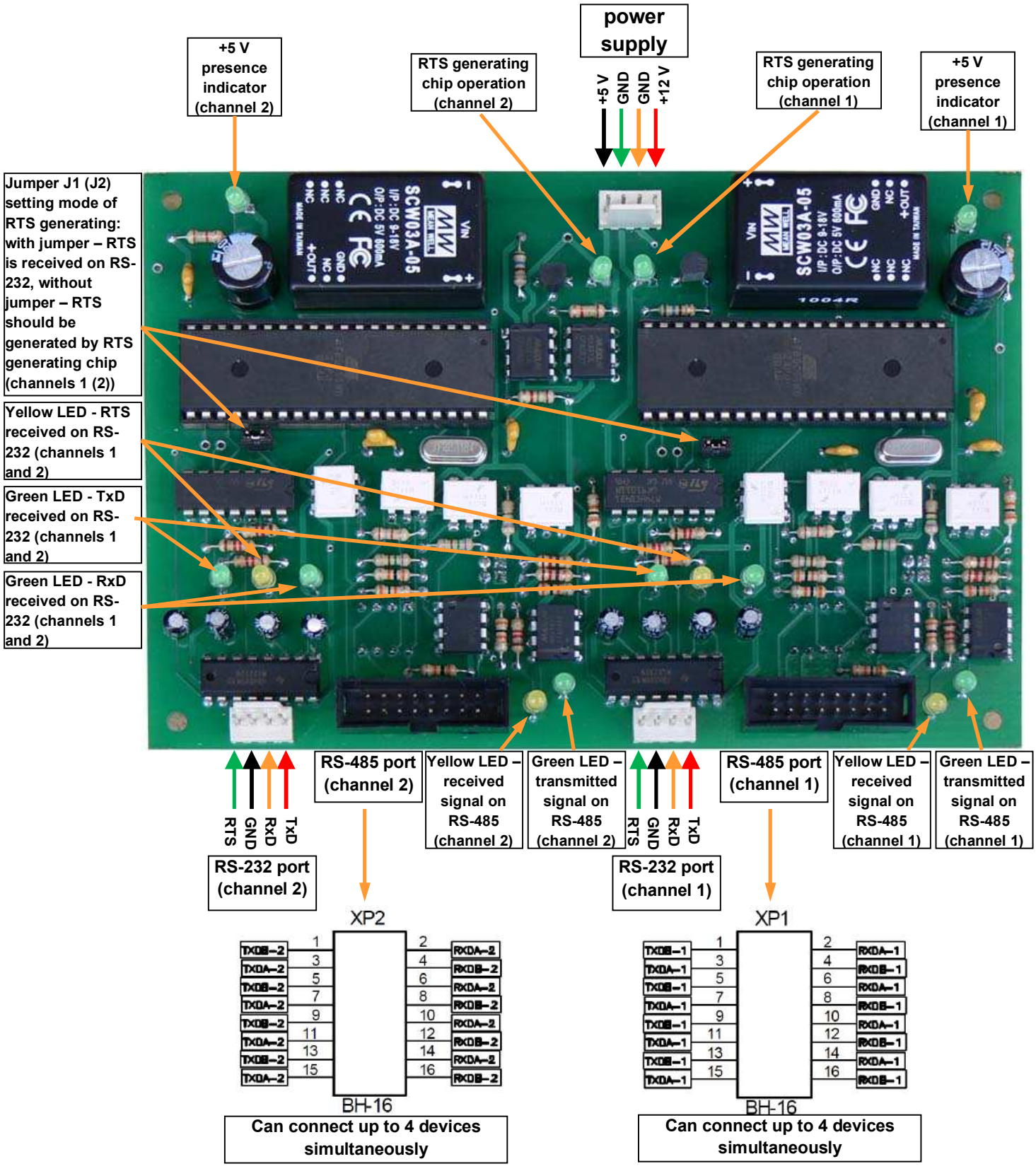
Communication ports

RS-232 port	RS-232 (can be with RTS control)
RS-485 port	Half-duplex (2-wire) or full-duplex (4-wire)

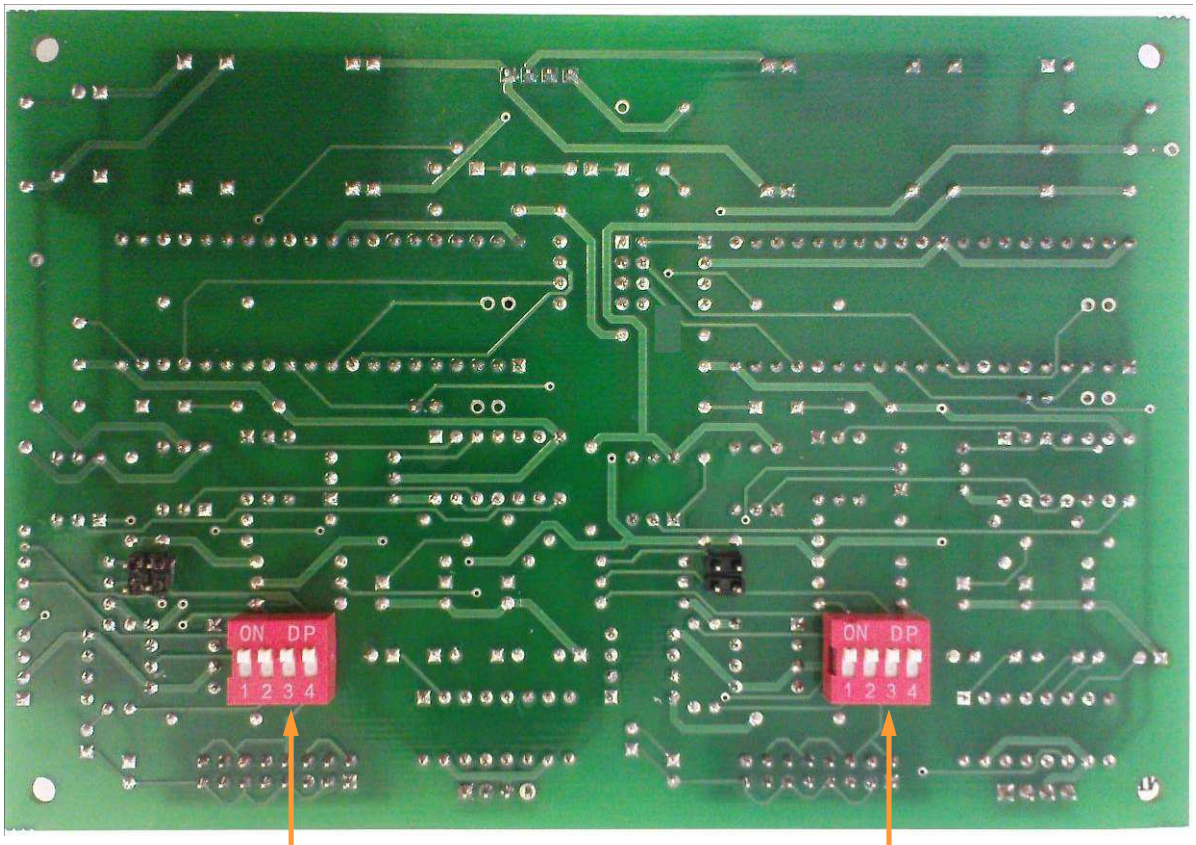
Features

Channels	Converter contains 2 separate independent channels
Galvanic isolation	Receiver and transmitter are galvanically isolated
RTS control	RS-232 port can receive RTS control, for cases when it does not receive RTS control a RTS generating chip should be installed

INTERFACE CONVERTER RS-232/RS-485 BOARD CONNECTORS AND INTERFACES



Top view


ON DP
1 2 3 4
ON DP
1 2 3 4
Switch S1 – configuration of channel 1
Switch S2 – configuration of channel 2

Bottom view

INTERFACE CONVERTER RS-232/RS-485 OPERATION

Signals of RS-232 interface enter the MAX232 chip, where are converted into signals of TTL logics, and after conversion go through optocouplers H11L1, that serve for galvanic isolation of transmitter and receiver, enter the TTL input of MAX485 chip, from the output of which signals of RS-485 interface are received. Analogous behavior takes places in contrary direction of signals.

The board of the Converter has 2 separate channels, the only thing which unites them is source voltage +5 V, which feeds interface RS-232. Voltage +5 V for circuits of RS-485 interface of the channels is taken from separate DC-DC converters with galvanical isolation for the channels.

Depending on the state of switches Sn (where n=1,2 – number of channel) output of RS-485 interface can be adjusted for operation in half-duplex or full-duplex modes (2-wire or 4-wire schemes of connection accordingly). When switches Sn:1, Sn:3, Sn:4 (where n=1,2 – number of channel) are in position "OFF" – the Converter works in full-duplex (4-wire) mode of RS-485 interface, in position "ON" - the Converter works in half-duplex (2-wire) mode of RS-485 interface. Switch Sn:2 (where n=1,2 – number of channel) is intended for switching on (position "OFF") or turning off (position "ON") of echo mode in half-duplex (2-wire) mode of RS-485 interface (repeating of all signals, received on input).

Half-duplex (2-wire) mode of RS-485 interface requires presence of RTS (Request To Send) signal on the input of RS-232 interface for synchronization of transmit/receive. In case if RTS signal is impossible to receive from the source of signal of RS-232 interface, then it is possible to generate it with a help of RTS generating chips of each channel, which are installed only in case of such necessity. If input of RS-232 interface contains RTS signals and RTS generating chips are not installed then it is necessary to place a jumper Jn (where n=1,2 – number of channel) for the required channel, in contrary case the jumper should be removed.

USB SOFTWARE PROTECTION DONGLE GUARDANT

Appointment

USB protection dongle Guardant is required for running of NaftaPOS software and fuel dispensers software simulators. To run this software it is necessary to have the dongle inserted in the USB port. Electronic protection dongle Guardant – is a device that is connected to USB port (or a parallel port LPT in older versions), located on a panel of a PC motherboard. Electronic protection dongle Guardant is necessary for protection of NaftaPOS software and fuel dispensers software simulators from unauthorized copying and illegal distribution. Scope of protection is that the dongle contains part of the code of protected software. Without a dongle being inserted to PC protected software will not launch and correspondent error will be shown to user.

Installation

To install Guardant dongle drivers run GrdDriversEN.msi.

Guardant USB dongle drivers are installed during NaftaPOS software installation process or can be installed/updated any time later:

During installation process it is necessary to follow all steps in the installation wizard until installation is completed.

NAFTAPOS SOFTWARE FOR PETROL STATIONS

Installation

NaftaPOS software can be downloaded using a link:
http://titdev.org.ua/download/eugene/NaftaPOS/naftapos.rar.

User Manual on NaftaPOS (English language variant) can be downloaded using a link: http://titdev.org.ua/download/eugene/NaftaPOS/NaftaPOS_user_manual.pdf. It is strongly recommended to read User Manual on NaftaPOS prior to installation.

More technical information regarding NaftaPOS software can be found on NaftaPOS software web-page: http://www.technotrade.ua/petrol_station_software.html

Front-Office software NaftaPOS is intended for control over technological processes, automated measurement and commercial account at petrol stations (also called fuel stations or gas stations) and petroleum storage depots.

Area of application – petrol stations for dispensing of light petroleum products, diesel fuel, liquified petroleum gas (LPG), compressed natural gas (CNG), multifuel petrol stations, petroleum storage depots.

NaftaPOS system is developed with account of all modern requirements to systems for automation of petrol stations, at this it is oriented as on small petrol stations, so as on big petrol complexes with organization of several working places of operators and administrator (Back-Office) of a petrol station.

NaftaPOS software is to be installed on a POS terminal (or a standard PC) with Microsoft Windows operation system (supported OS Windows 2000, XP, Embedded POSReady 2009, Vista, 7).

Hard drive of a PC should be divided into two logical drives C:\ and D:\. Logical drive C:\ should have an installed OS Microsoft Windows, necessary set of drivers for correct operation of motherboard peripherals, file managers.

Installation of NaftaPOS software is recommended to be made to logical drive D:\ (drive D:\ is set in installer by defaults).

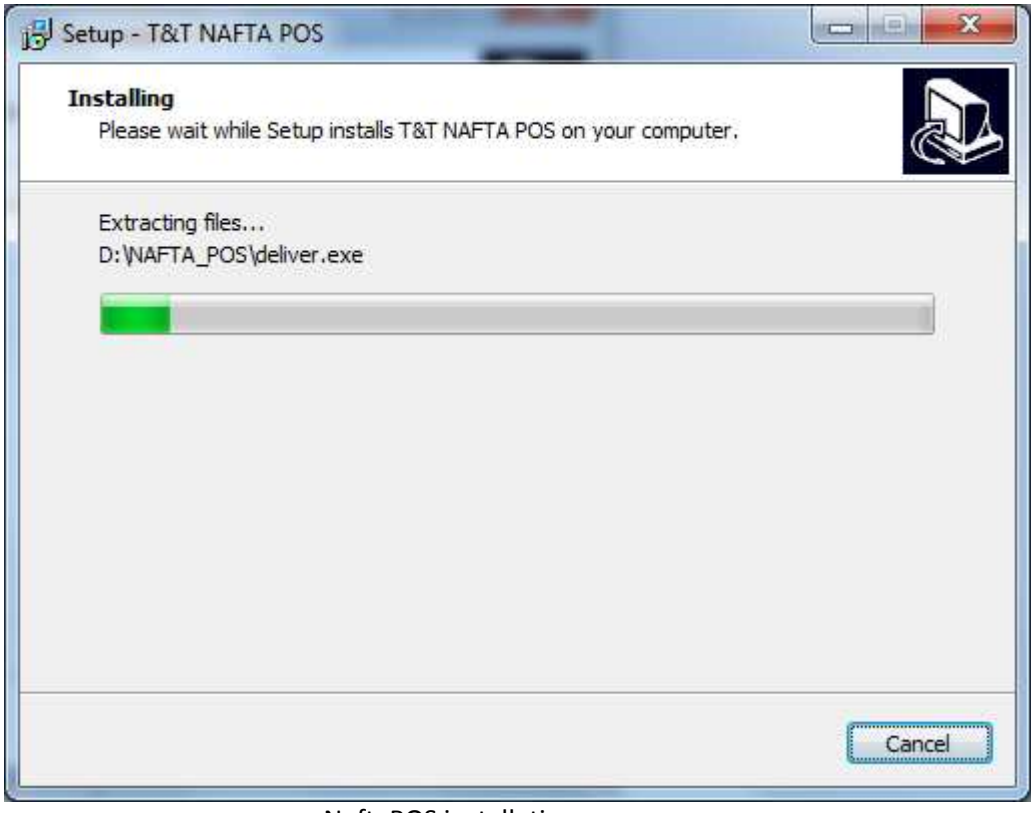
At using NaftaPOS you should in Windows Control Panel in configuration of regional parameters on tabs "Numbers" and "Currency unit" as a "Separator of integer and fractional parts" set '.' (point, dot).

Minimal requirements to a PC include the following:

- 1 GHz CPU
- 1 GB RAM
- 60 GB HDD

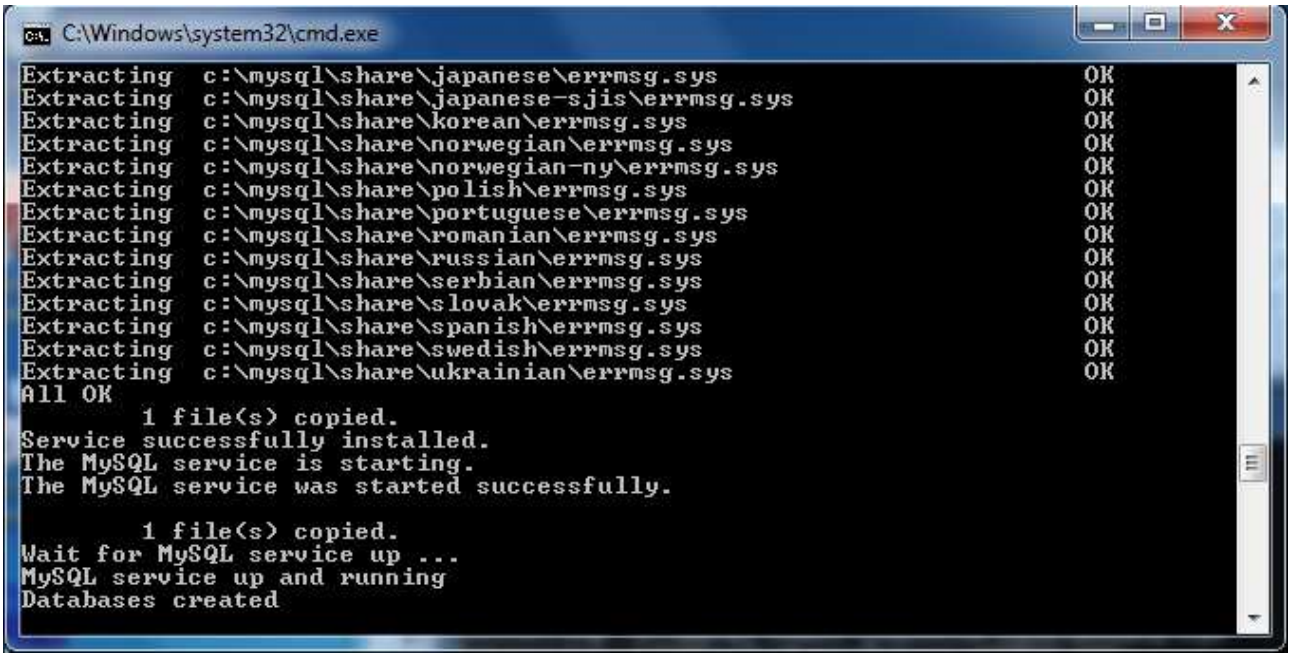
Installation of NaftaPOS software is made by running an installation file naftapos.exe and following instructions, specified in installation wizard windows:

Make sure that the system is installed on drive D:\.



NaftaPOS installation process

During installation process MySQL RDMS will be installed (starting MySQL service):

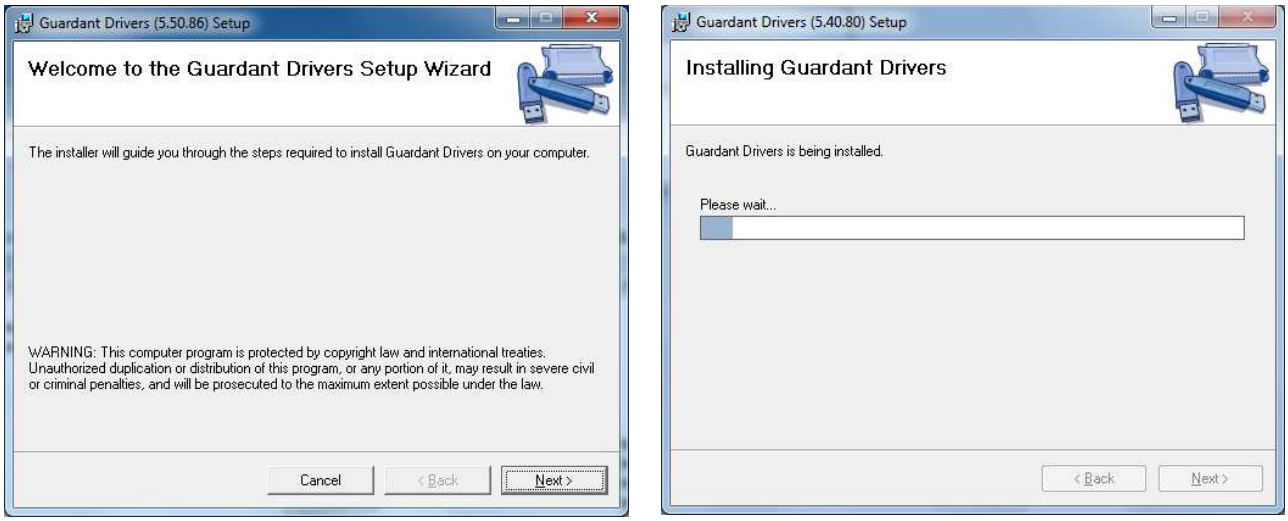


NaftaPOS installation process – MySQL DBMS installation

Borland Database Engine will be installed during NaftaPOS software installation process, so it is important to agree with a request on its installation:

NaftaPOS installation process – Borland Database Engine installation

Guardant dongle drivers are installed during NaftaPOS software installation process, so it is important to agree with a request on its installation:



Installation process – Guardant dongle drivers installation

During installation the following NaftaPOS services will be installed:

- T&T barcode server
- T&T database server
- T&T Scheduler
- T&T log service

NaftaPOS installation process – service installation

After installation of NaftaPOS software a logical drive D:\ will contain the following directories and files:
Directory "NAFTA_POS" with all files of NaftaPOS software;
NaftaPOS system files that track its operation (log-files):

- !autorun_err.txt;
- !clean_db_err.txt;
- !backup_err.txt,
- !hour_err.txt,
- autorun.txt,
- backup.txt,
- hour.txt;
- clean_db.txt;
- Cmd_log.txt;
- CashErr.txt,
- Controller.txt,
- dblog.txt,
- main_logfile.txt;
- others.

By content of these log-files it is possible to track reasons of possible errors and misoperations arisen during software operation and lead a log of actions performed by operator of the petrol station. This information is written in logs that at necessity can be sent to TECHNOTRADE LTD company for defining of found errors and their initial reasons with subsequent fixing of these errors.

Configuration of NaftaPOS software

For configuration of NaftaPOS software it is necessary to have:

- administrator rights in Windows XP operation system
- administrator rights in NaftaPOS system

Configuration of NaftaPOS software is made in configuration tool POSSet.exe (D:\NAFTA_POS\POSSet.exe) which can also be run from NaftaPOS software by selecting an item from main menu 'Administrator' → 'Configuration'.

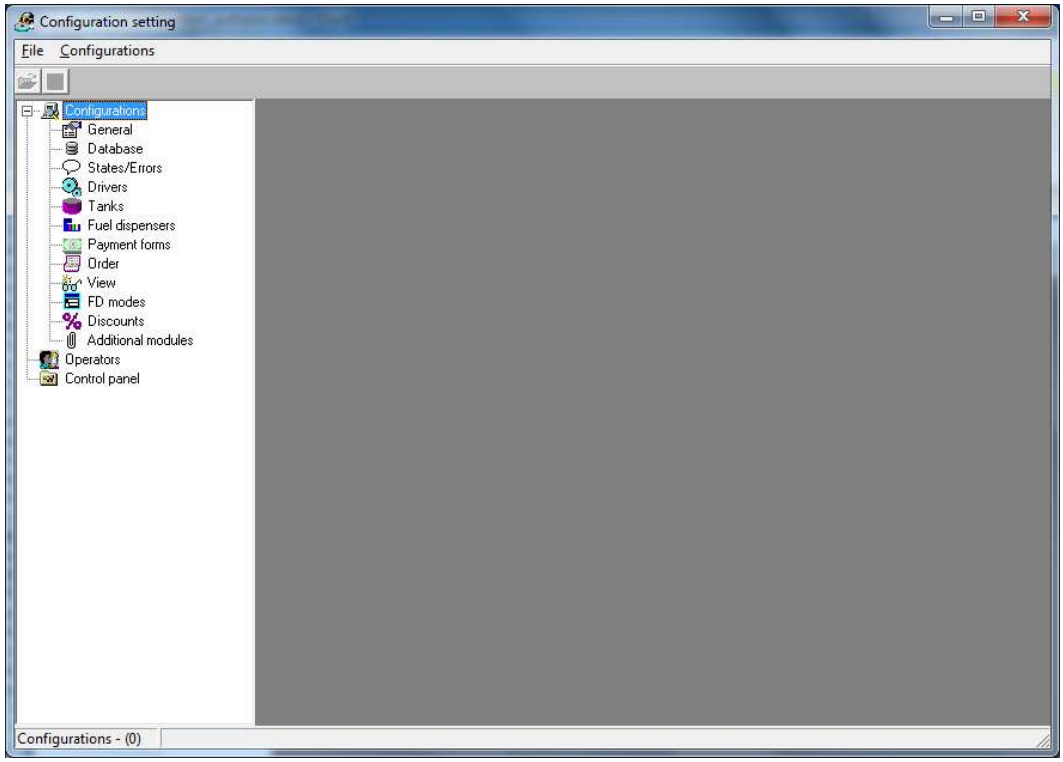
At entering the configuration tool a user is requested to authenticate in order to prove his permission to make configurations of the system:

Authentication window

By defaults after installation there is only 1 user present with the following credentials:

- login: Service
- password:

After logging inside the configuration tool the following window is shown, where on the left side – there is a selector of tabs to be configured, and on the right side – configurable parameters of selected tab.

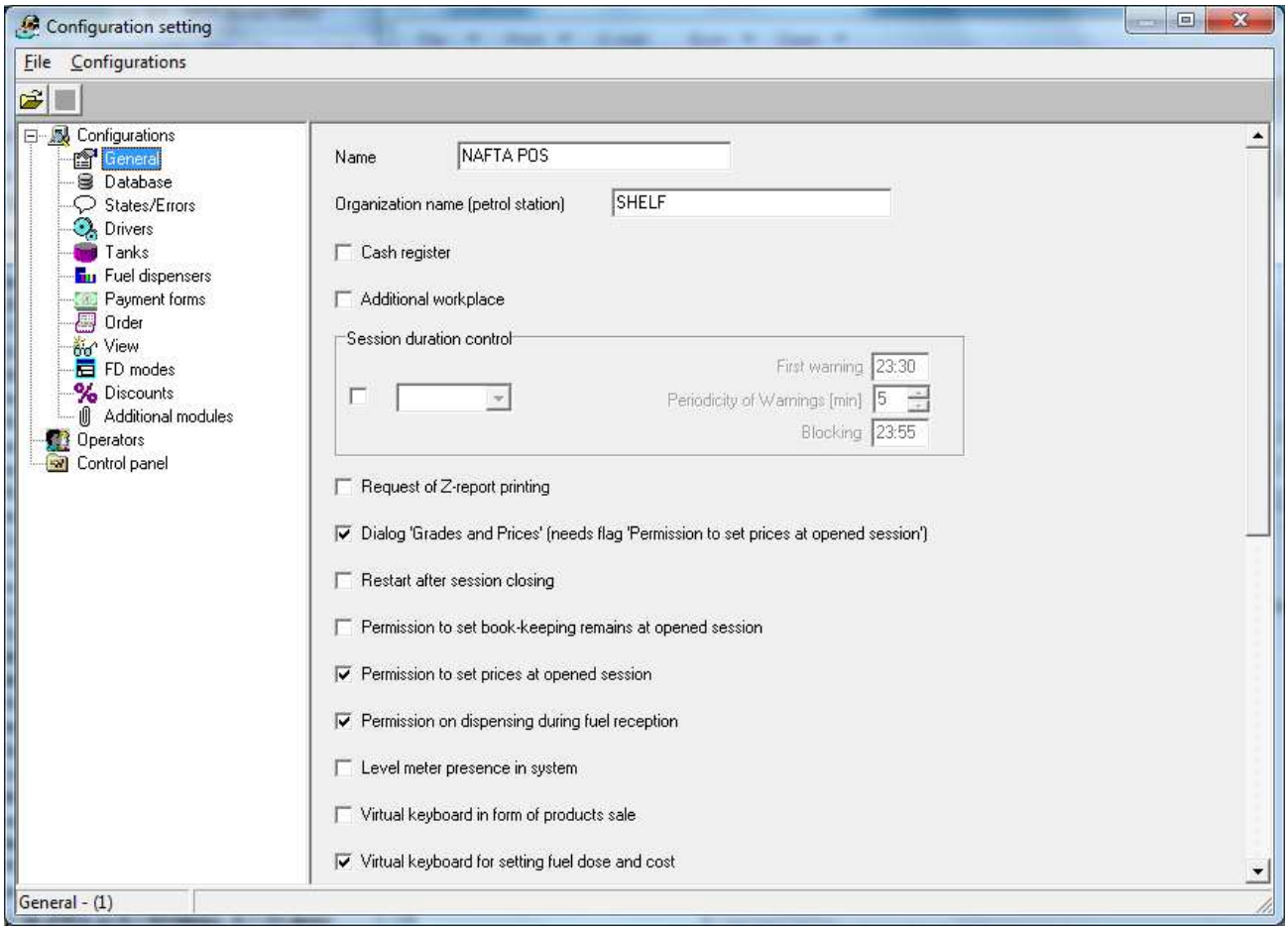


POSSet.exe – main view of configuration tool

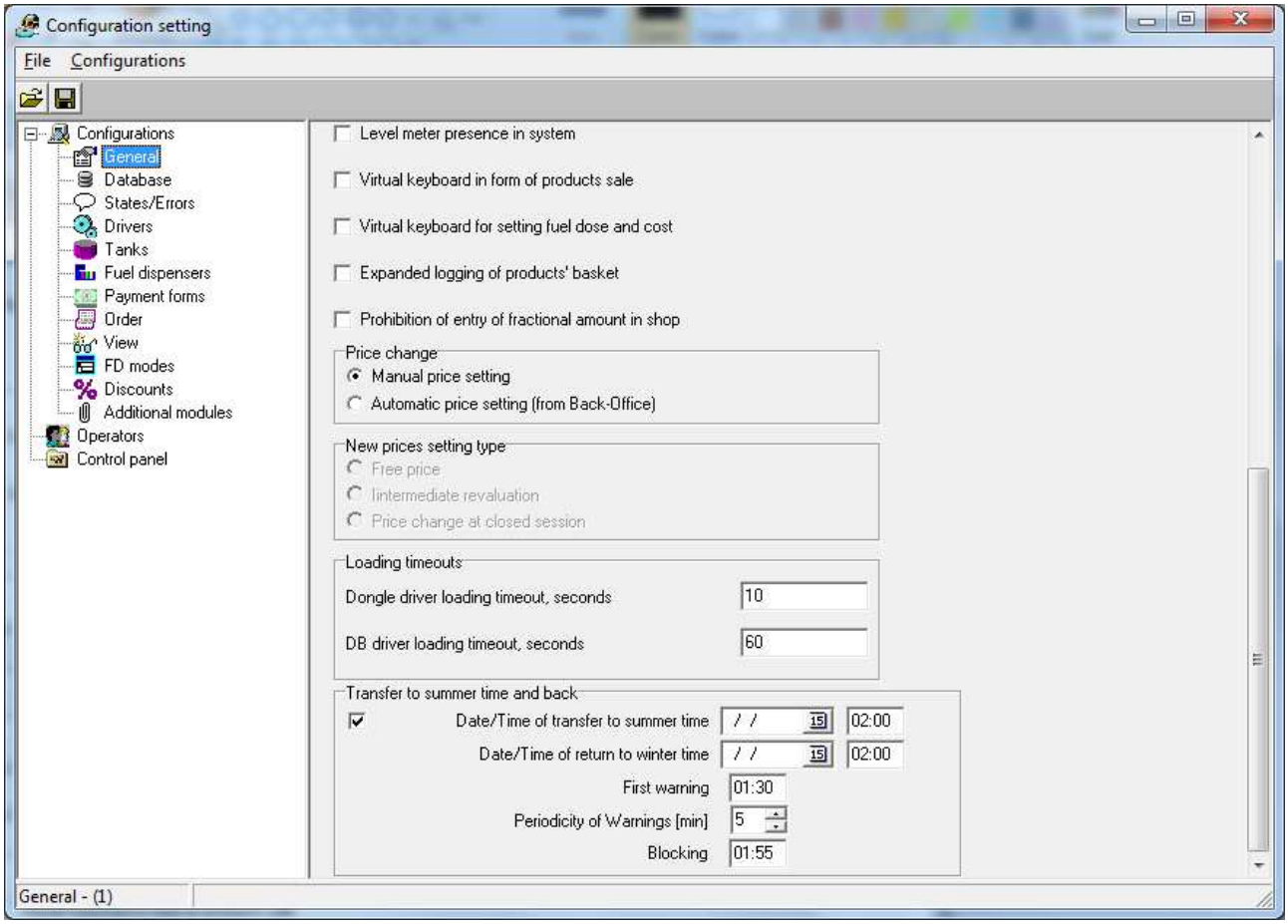
Initial configuration of NaftaPOS should include:

1. On tab ‘General’ check the following checkboxes:
   - Dialog ‘Grades and Prices’ (needs flag ‘Permission to set prices at opened session’)
   - Permission to set prices at opened session
   - Permission on dispensing during fuel reception

   Other checkboxes can be left unchecked.
   Additionally check ‘Manual price setting’ in Price change panel.

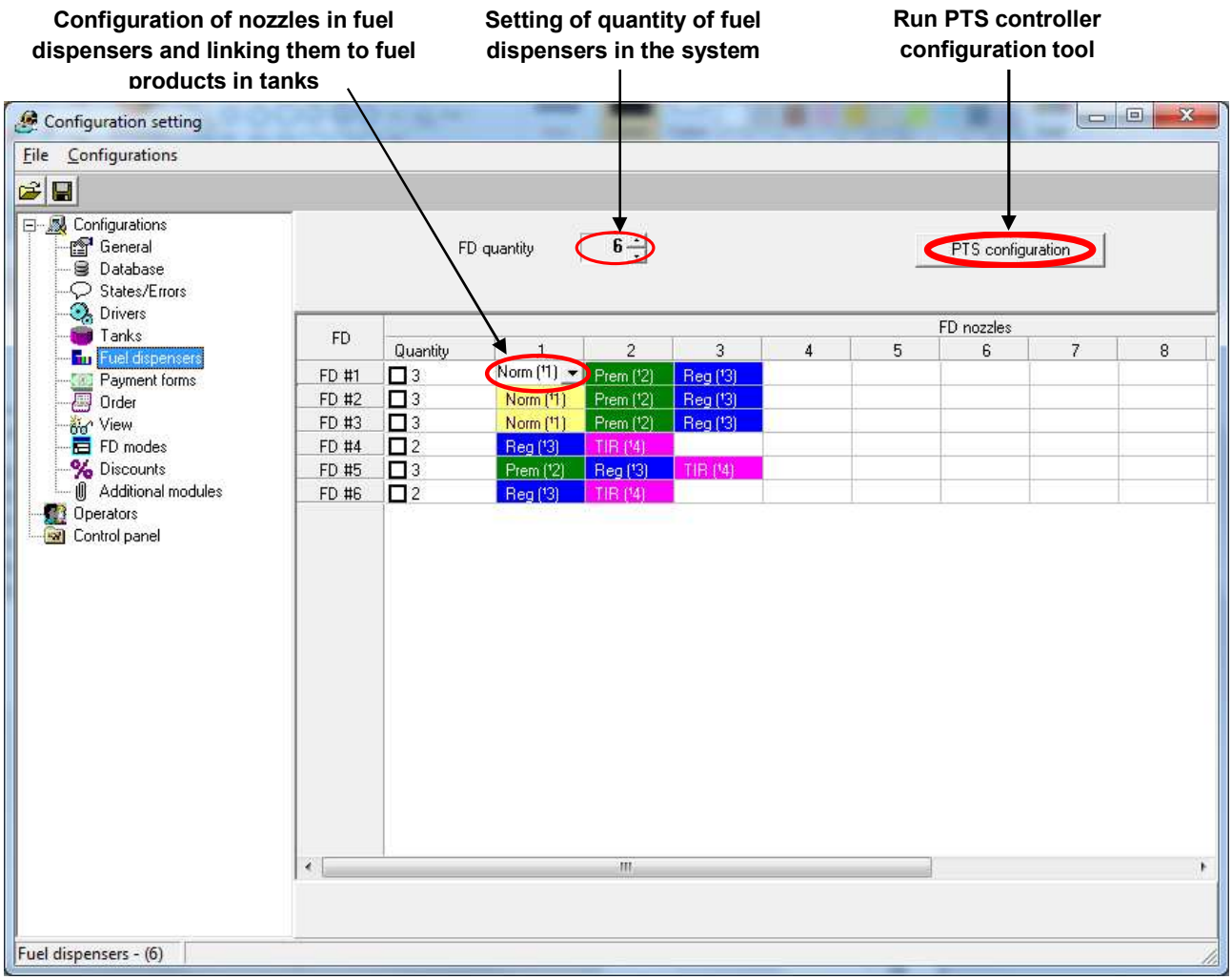


NaftaPOS configuration tool – “General” tab, view 1



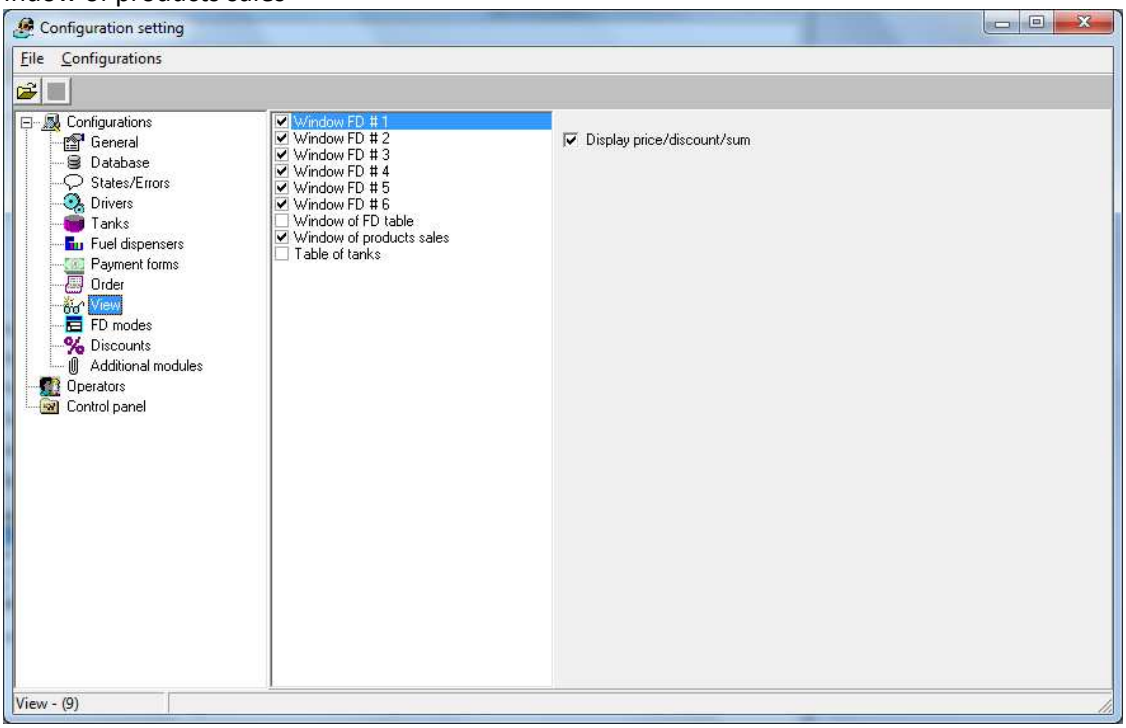
NaftaPOS configuration tool – “General” tab, view 2

2. On tab ‘Fuel dispensers’ select quantity of displayed fuel dispensers (FD quantity) equal 4.



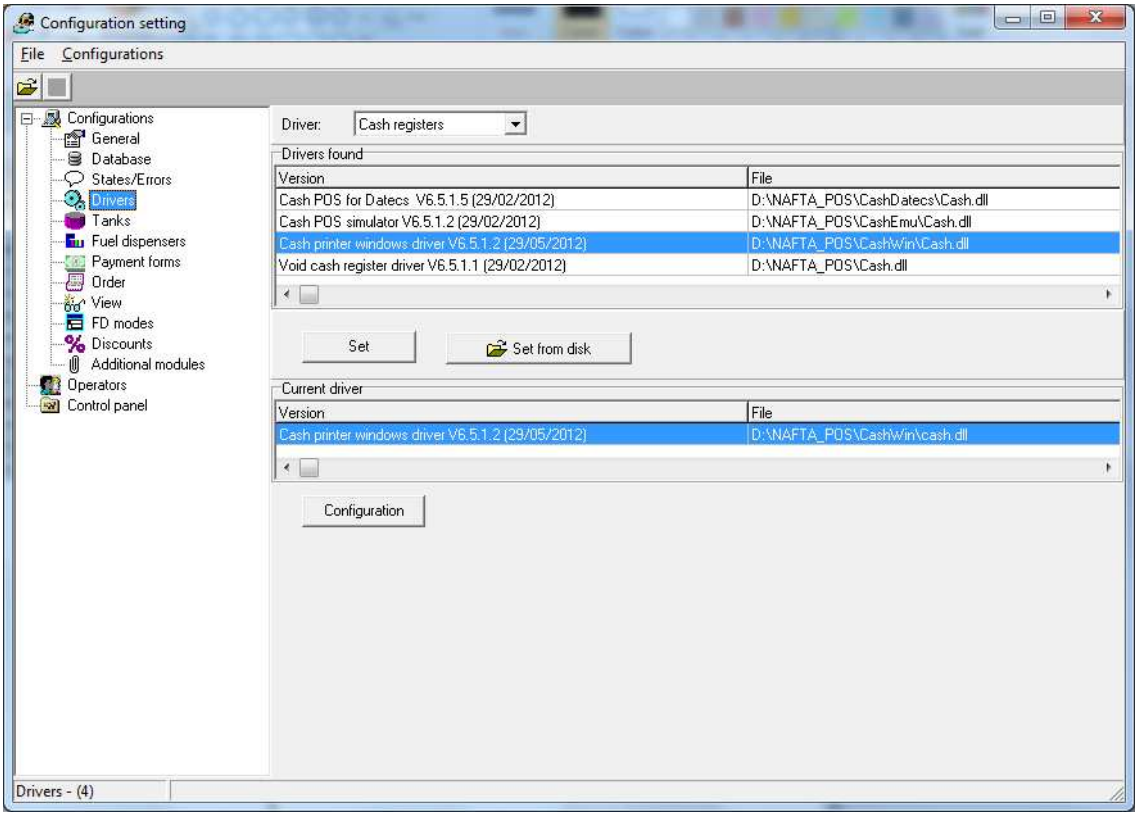
Configuration of fuel dispensers and their nozzles in system

3. On tab ‘View’ check checkboxes near
   - Window FD #1
   - Window FD #2
   - Window FD #3
   - Window FD #4
   - Window of products sales



Configuration of set of windows displayed in the main panel of the system

4. Tab ‘Drivers’ serves for configuration of drivers of connected equipment to NaftaPOS software, namely:
   - Cash registers (receipt printers)
   - Forecourt controllers
   - ATG systems
   - Barcode scanners



NaftaPOS configuration tool – “Drivers” tab: configuration of drivers of connected equipment

Using a dropdown list "Driver" it is possible to select equipment, for which a driver is to be set. This list includes the following items:

- Cash register
- Controller
- Tanks
- Barcodes scanner
- Controller service
- Tanks service

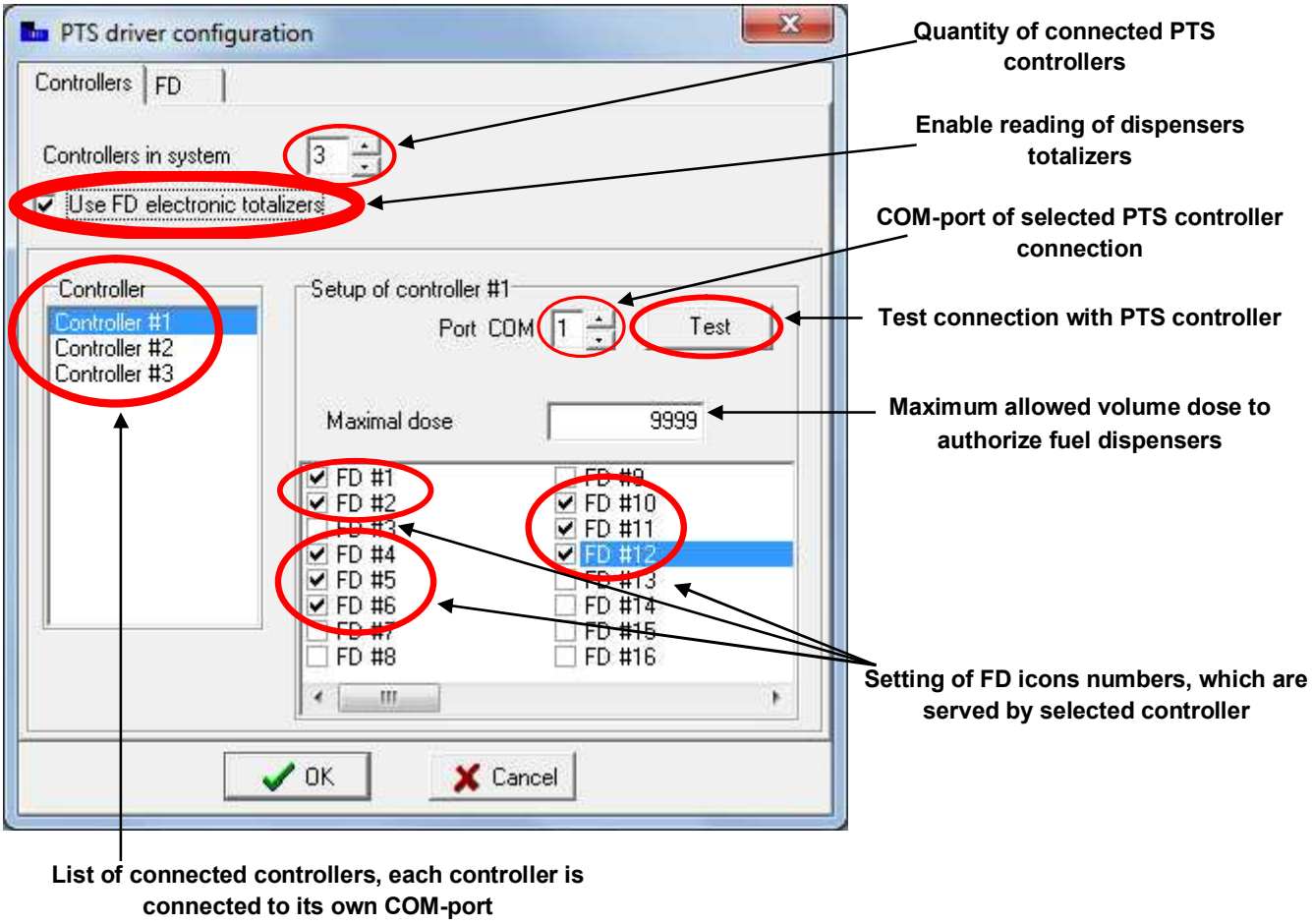
For test operation it is recommended to set the following configuration:

- As driver of cash register select "Void cash register driver"
- As driver of controller select "PTS controller"
- As driver of tanks select "PTS ATG driver"

Configuration of pump controller

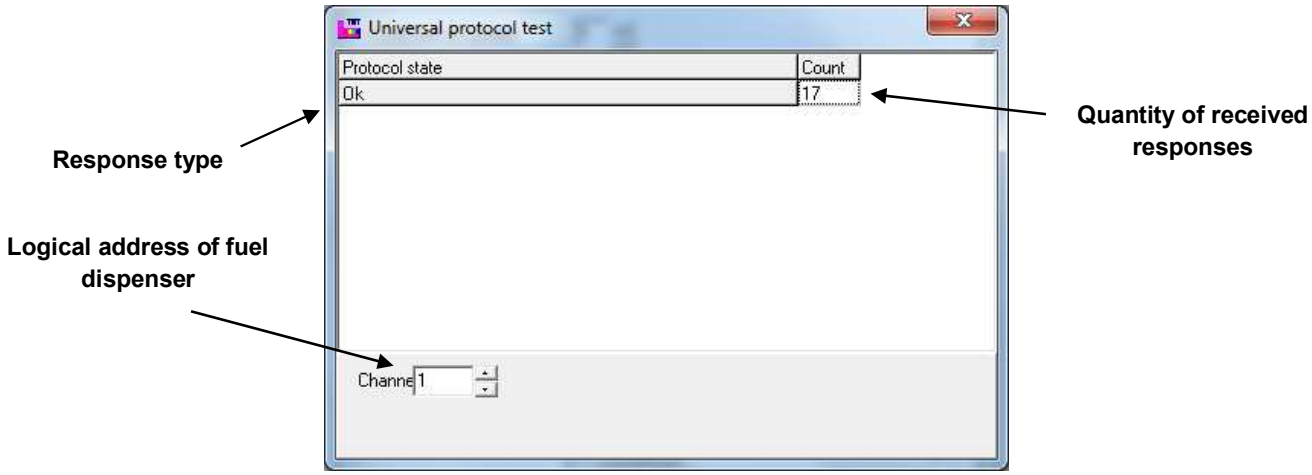
Driver "PTS controller" is used to provide control over fuel dispensers using the PTS controller.

Configuration of the PTS controller driver includes the following:



Configuration of "PTS controller" driver (tab "Controllers")

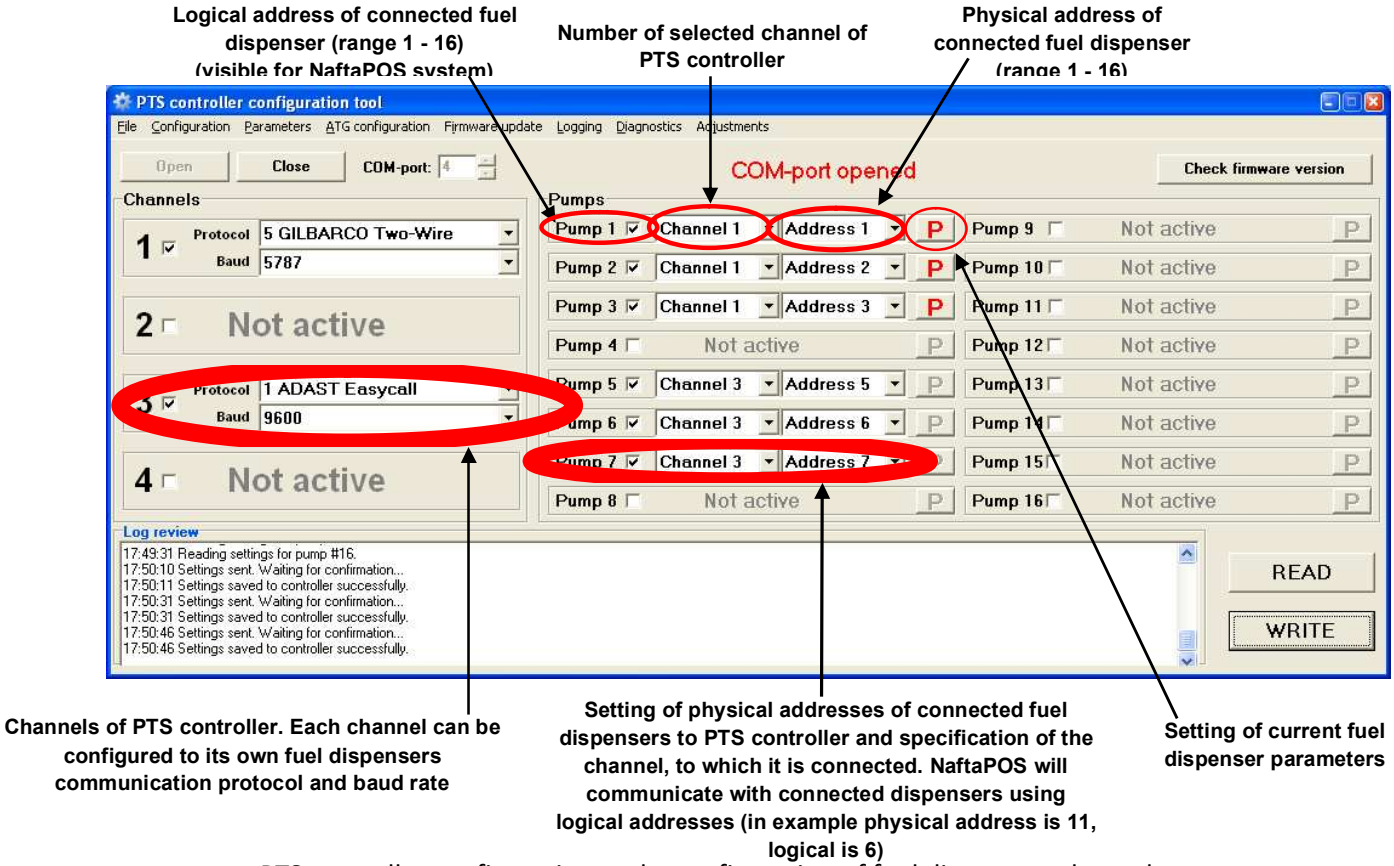
Clicking of button "Test" opens a window for checking communication with the current PTS controller on specified COM-port: If response is OK – communication is successful, otherwise various errors will be displayed.



Test of communication with PTS controller

In configuration of "PTS controller" driver only logical addresses of dispensers are set, the original physical addresses are specified in PTS controller configuration tool.

Configuration of PTS controller is made by calling pts_conf.exe tool, which is launched from tab "Fuel dispensers" by clicking a button "PTS configuration" (location on the disk is D:\NAFTA_POS\pts_conf\pts_conf.exe"). General view of PTS controller configuration tool is shown on image:



PTS controller configuration tool – configuration of fuel dispensers channels

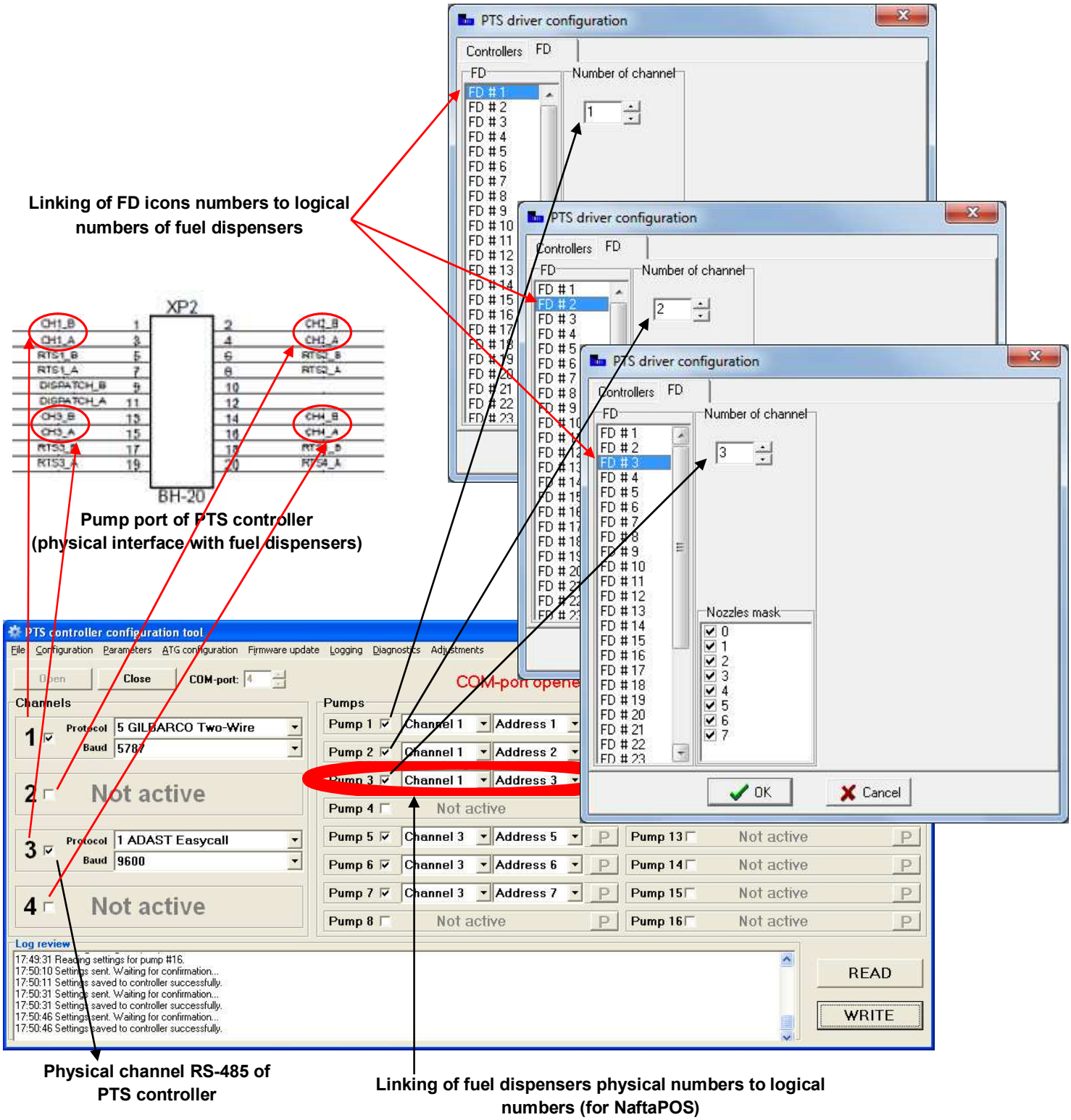
NOTE!

Due to a reason of constant development of PTS controller and adding to it communication protocols of new fuel dispensers and ATG systems PTS controller configuration tool is also constantly being developed. That is why in order to have the latest version of the configuration tool and the latest firmware of the PTS controller – request it from "TECHNOTRADE LTD" company. Location of PTS controller configuration tool (in case of installation of NaftaPOS on drive D:\) is "D:\NAFTA_POS\pts_conf\".

More detailed information regarding PTS controller and its configuration can be found on the web-page of the PTS controller: http://www.technotrade.ua/fuel_pump_controller.html.

Linking of FD icons numbers to logical addresses of fuel dispensers set in PTS controller configuration tool is made on tab “FD” of PTS controller driver:

Field “Nozzles mask” serves for specification of what nozzles are enabled in selected FD (for normal operation all checkboxes should be checked).



Configuration of “PTS controller” driver (tab “FD”) – linking of FD icons numbers to logical numbers of fuel dispensers

Driver "Virtual controller" is used for simulation of fuel dispensers. At using of this driver NaftaPOS can simulate presence of actual fuel dispensers, but at this no real dispensers are connected to the system. This driver is often used in situations when between all the dispensers on the petrol stations there 1 (or several) dispensers, which can not be automated, but account on these dispensers should be lead. In such a way NaftaPOS will indicate FD icons on the screen and virtual sales through these dispensers will be possible to be made, which will be indicated in the reports.

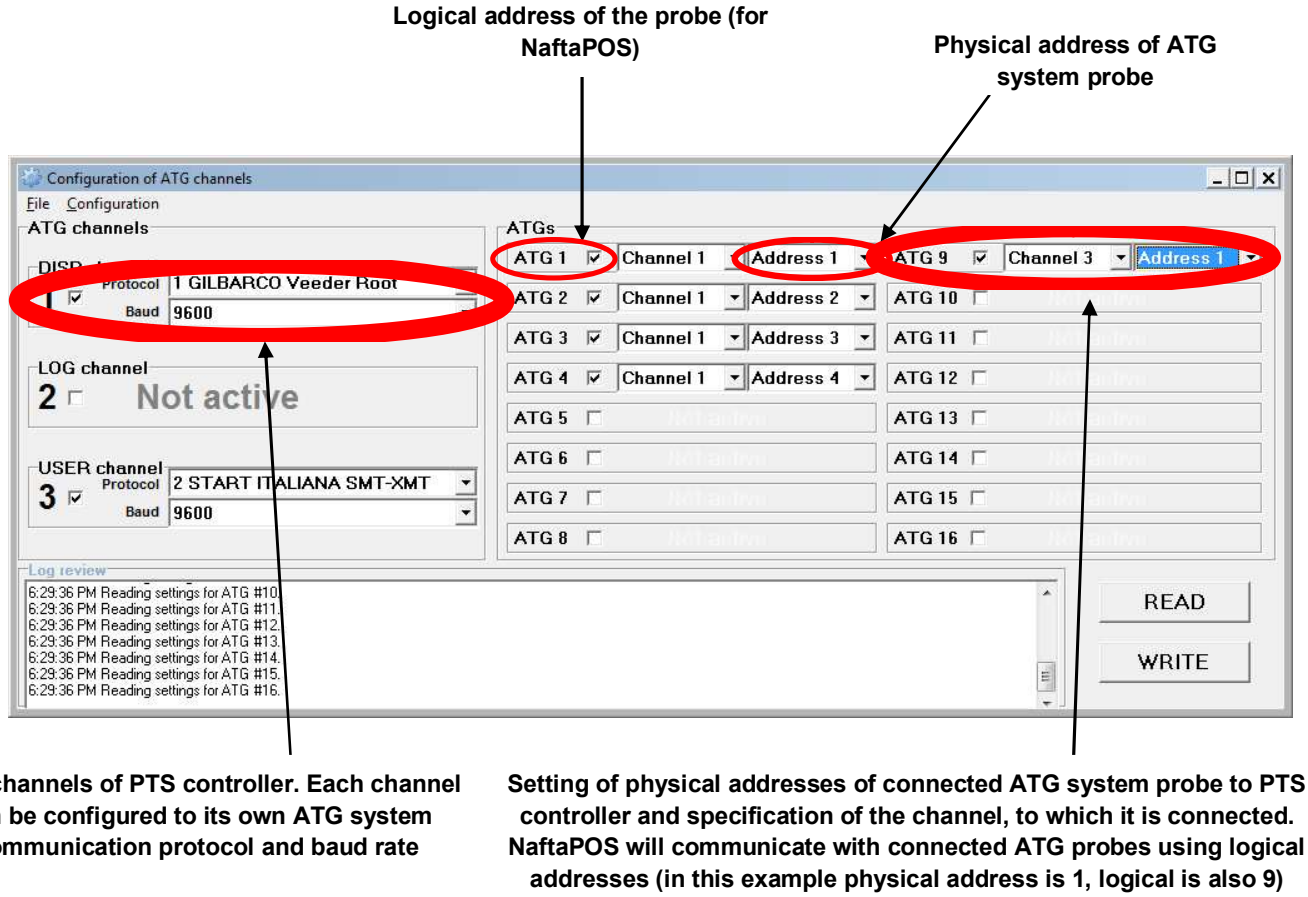
Driver "Virtual controller (HIGHSPEED)" is used for simulation of fuel dispensers like driver "Virtual controller", but unlike it dispensing is made very quickly and there is no need to wait until dispensing is finished no matter what is the order value.

Configuration of ATG controller

Driver "PTS ATG driver" is used for communication with various ATG systems using the PTS controller..

In configuration of "PTS ATG driver" driver only logical addresses of ATG system probes (sensors) are set, the original physical addresses of probes are specified in PTS controller configuration tool.

Configuration of PTS controller is made by calling pts_conf.exe tool, which is launched from tab "Fuel dispensers" by clicking a button "PTS configuration" (location on the disk is D:\NAFTA_POS\pts_conf\pts_conf.exe"). Configuration of the connected ATG systems is made from a main menu item "ATG configuration" → "Configuration of ATG channels" as shown on the image:



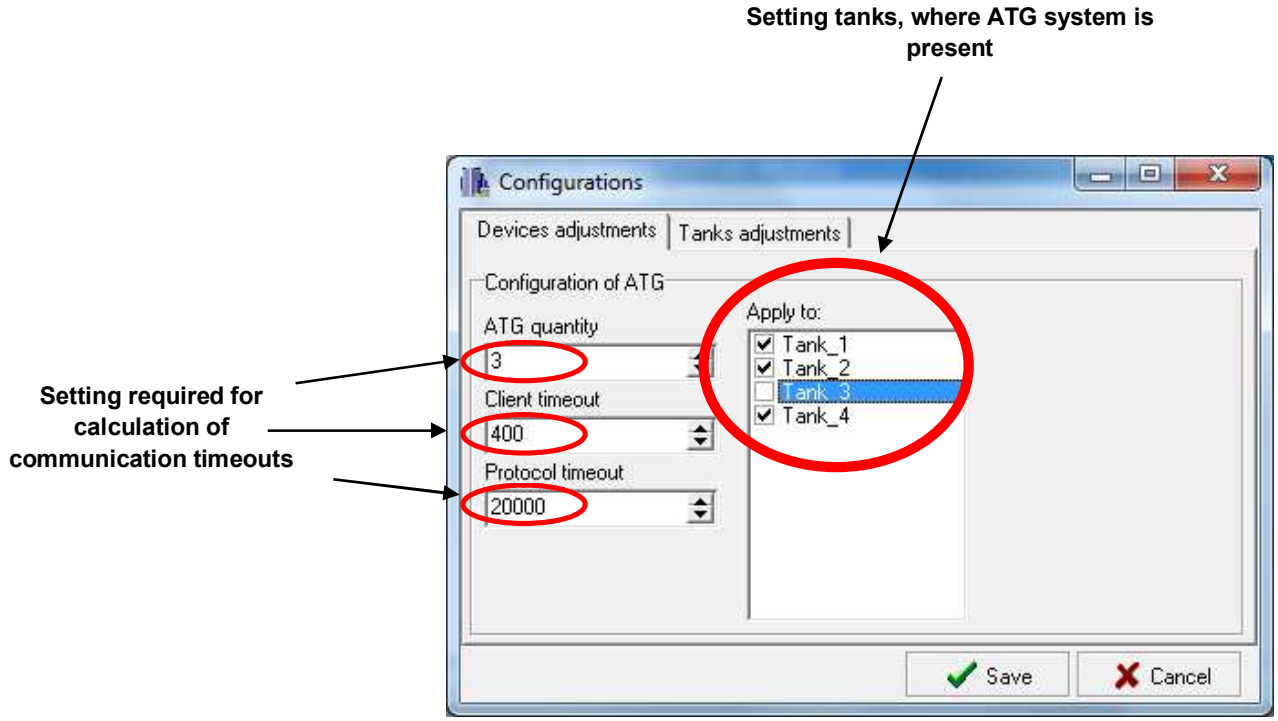
PTS controller configuration tool – configuration of ATG systems channels

NOTE!

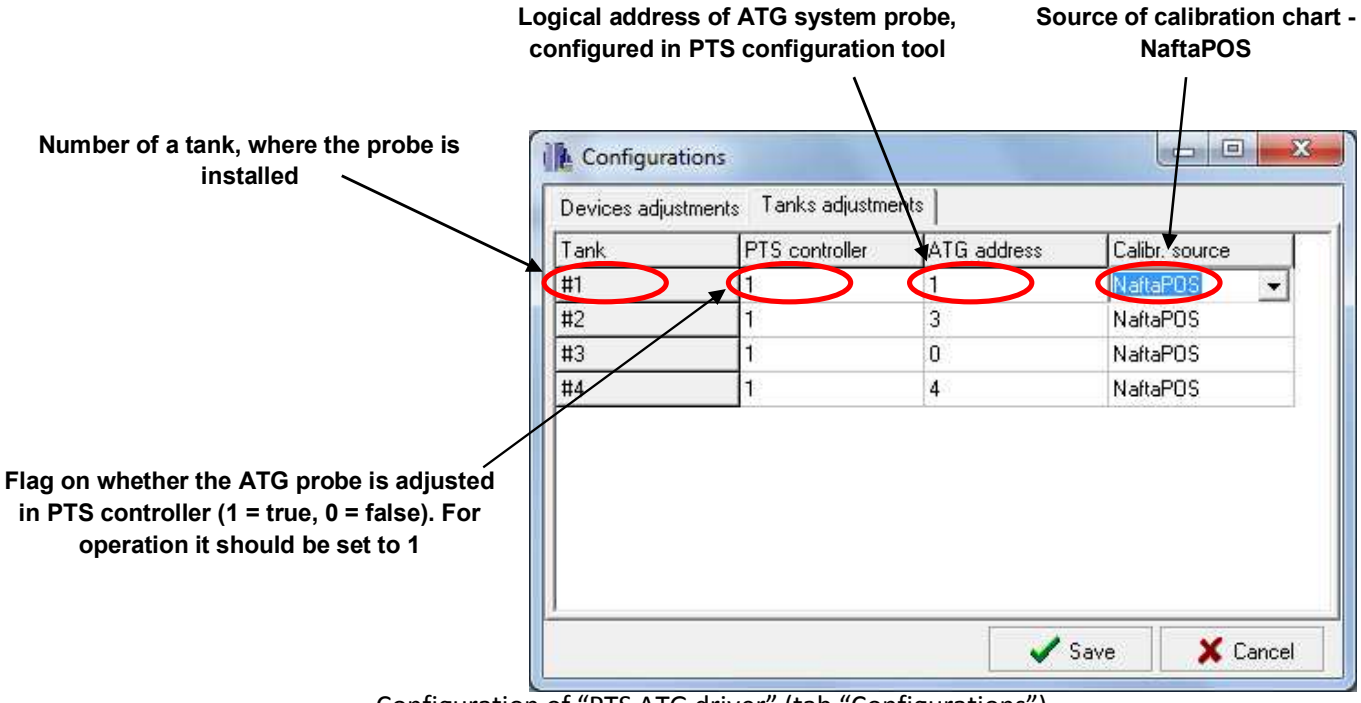
Due to a reason of constant development of PTS controller and adding to it communication protocols of new fuel dispensers and ATG systems PTS controller configuration tool is also constantly being developed. That is why in order to have the latest version of the configuration tool and the latest firmware of the PTS

controller – request it from "TECHNOTRADE LTD" company. Location of PTS controller configuration tool (in case of installation of NaftaPOS on drive D:\) is "D:\NAFTA_POS\pts_conf\".
More detailed information regarding PTS controller and its configuration can be found on the web-page of the PTS controller: http://www.technotrade.ua/fuel_pump_controller.html.

Configuration of the PTS controller driver includes the following:



Configuration of "PTS ATG driver" (tab "Devices adjustments") – configuration of ATG probes quantity and their application in tanks



Configuration of "PTS ATG driver" (tab "Configurations")

Driver "Driver of virtual tank" is used for simulation of ATG system presence in system. This driver should be set, when there is no ATG system connected. In this case a checkbox "Level meter presence in system" on tab "General" should be unchecked.

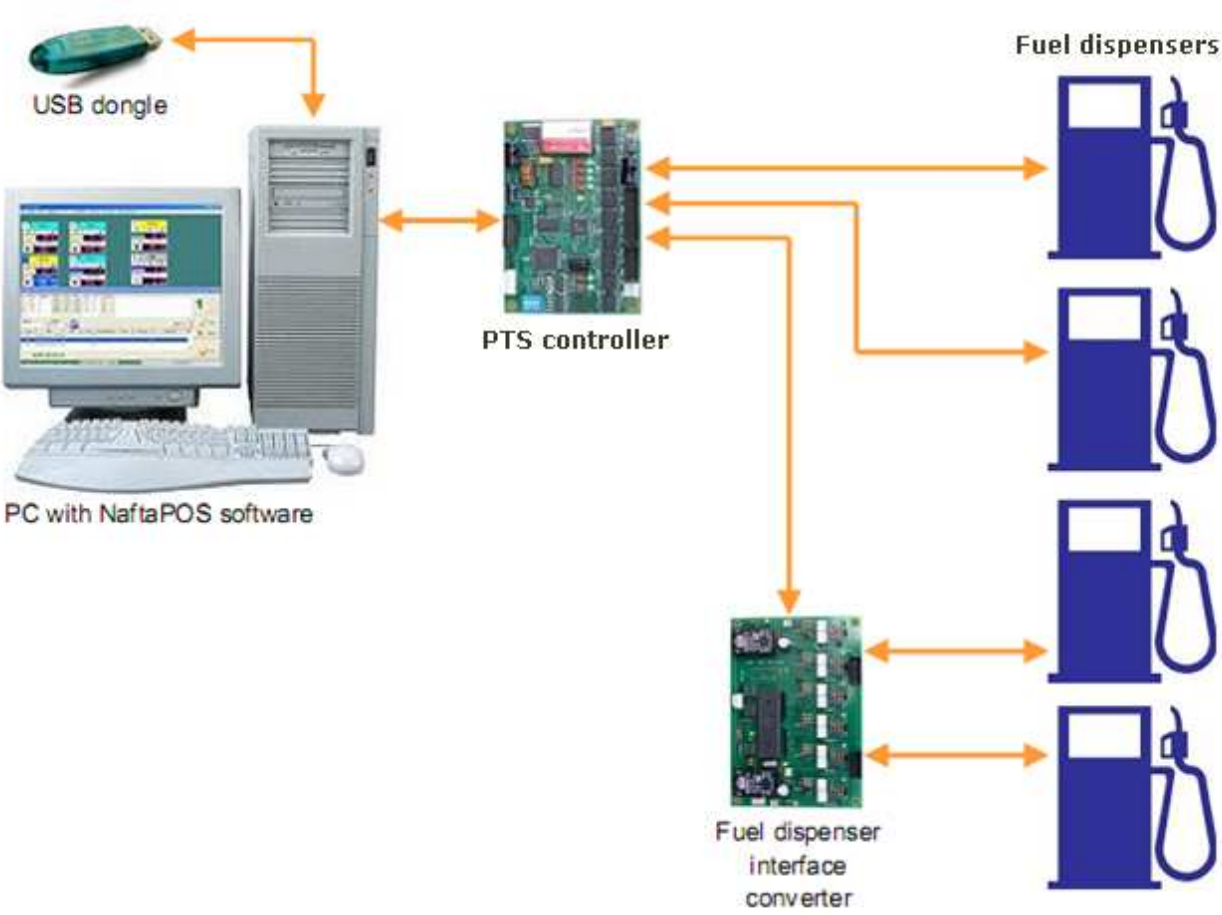
Starting of NaftaPOS software

NaftaPOS software is to be started by running AZSPos.exe (D:\NAFTA_POS\ AZSPos.exe). After checking of connected equipment you will see a desktop of NaftaPOS (graphical user interface is adjustable in right-mouse button menu).

In "NAFTAPOS" sessional mode of operation is applied. Operator at beginning of work should open a new session (in main menu tab 'SESSION' → item 'NEW SESSION'). Session control is to be applied in countries with fiscal legislation and can be switched off in configuration tool POSSet.exe (on tab 'General' checkbox 'Session duration control').

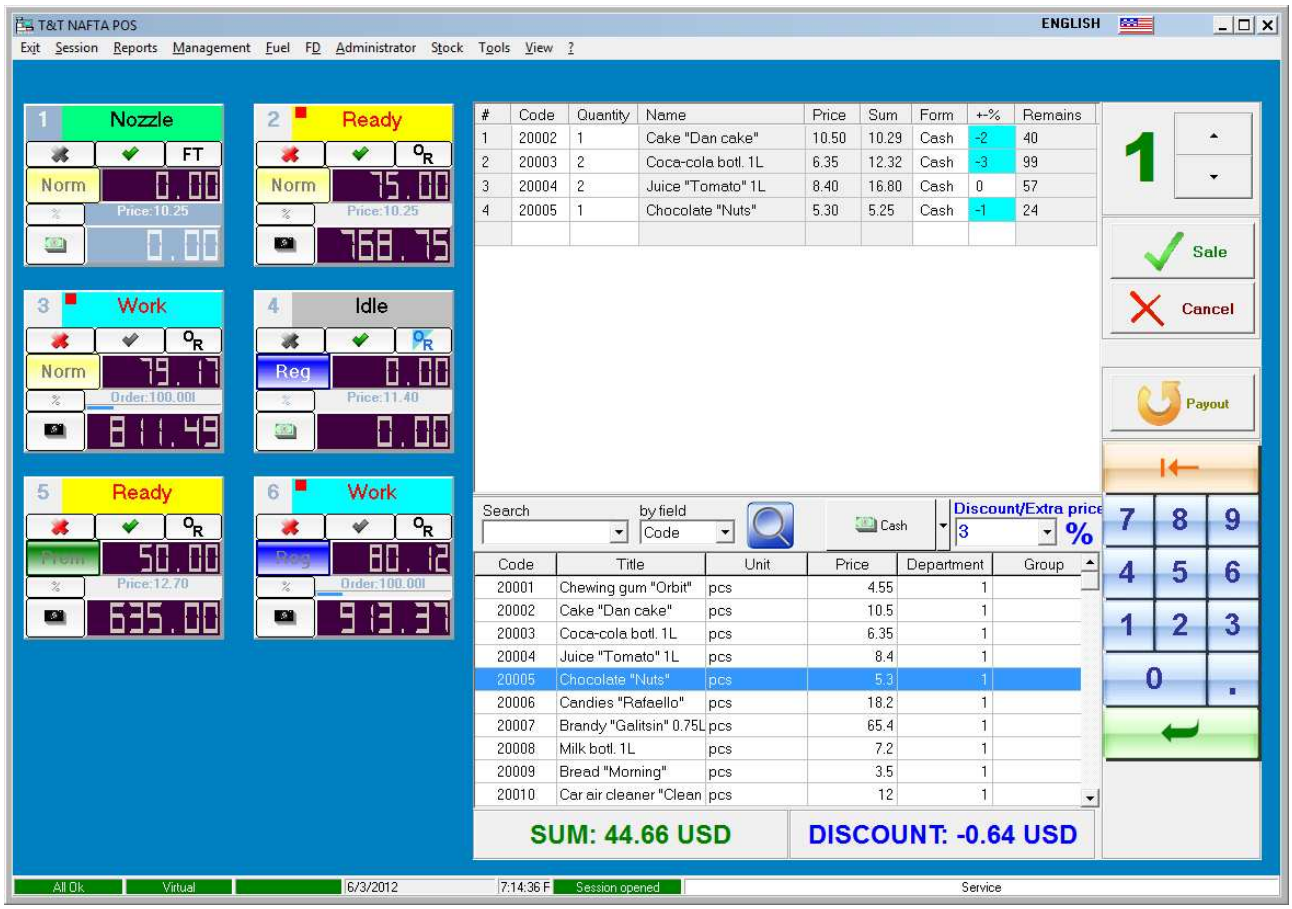
Connect PTS controller to PC in accordance to a scheme shown on picture below. Run NaftaPOS software (D:\NAFTA_POS\AZSPos.exe). Start a new working session (in main menu tab 'SESSION' → item 'NEW SESSION') under 'Service' user.

To understand better how to work in NaftaPOS and lead control over fuel dispensers, sales of products, management over a petrol station – please see online video on the NaftaPOS software web-page: http://www.technotrade.ua/petrol_station_software.html.

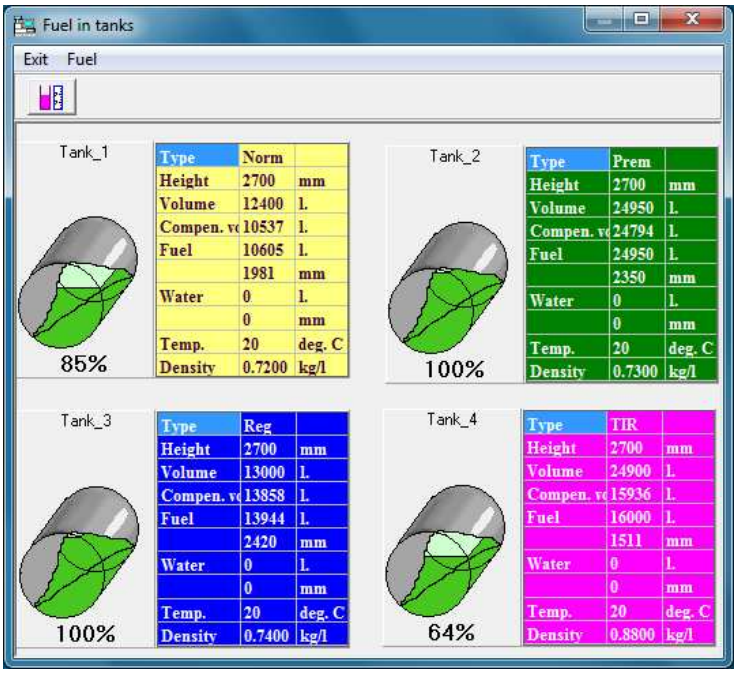


Connection scheme of a PC with NaftaPOS software to fuel dispensers through PTS controller.

For translation of NaftaPOS software into any language it is necessary to translate English language text strings in file nafta.lng.txt (D:\NAFTA_POS\nafta.lng.txt) into a new language.



Main view of NaftaPOS software for petrol stations (control over fuel dispensers and sales of products).



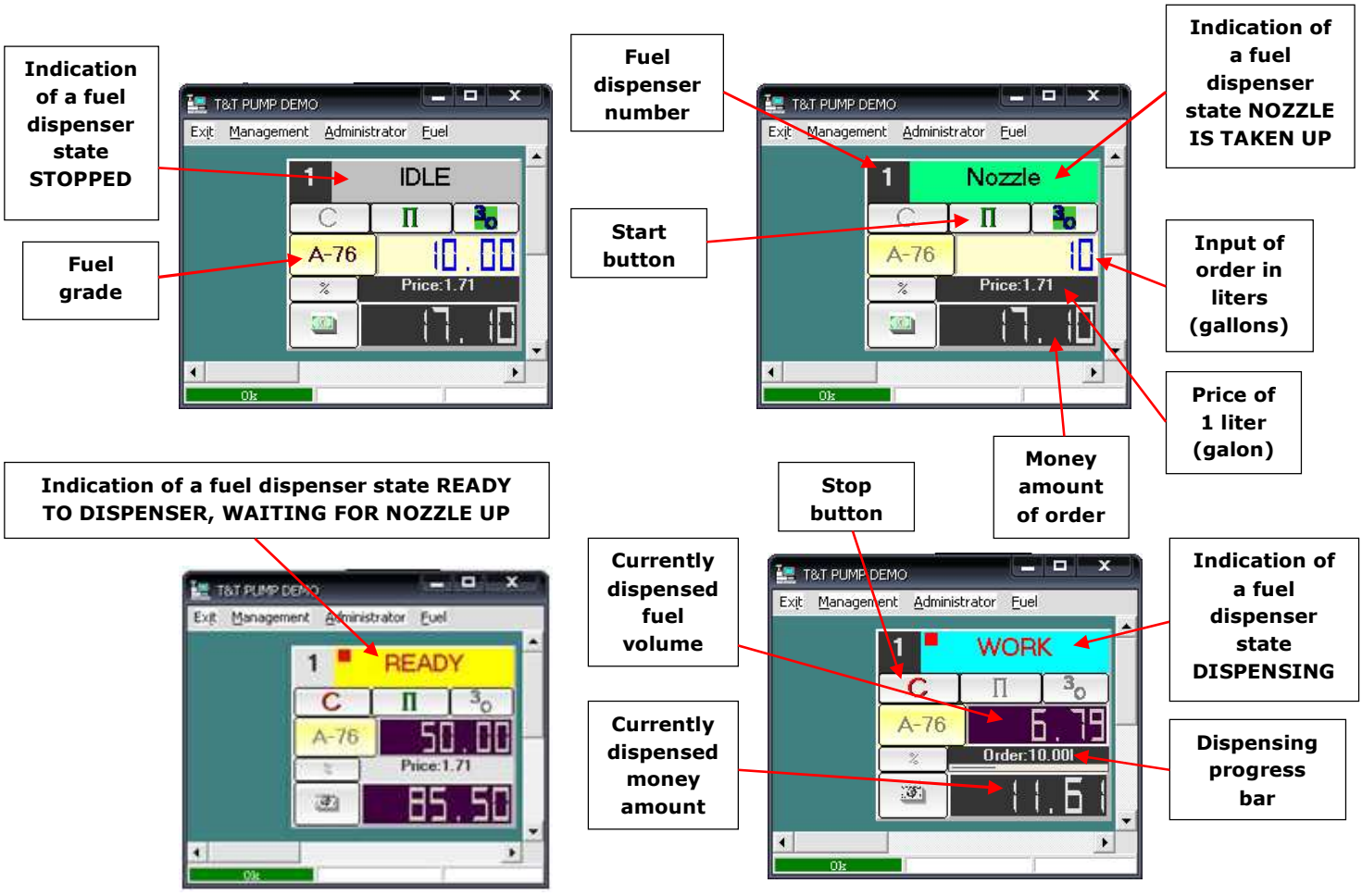
Current remains of fuel in tanks.

PUMPDEMO SOFTWARE

PumpDemo software is a contracted version of NaftaPOS software used for debugging purposes. It does not require installation.

Configuration of PumpDemo includes:

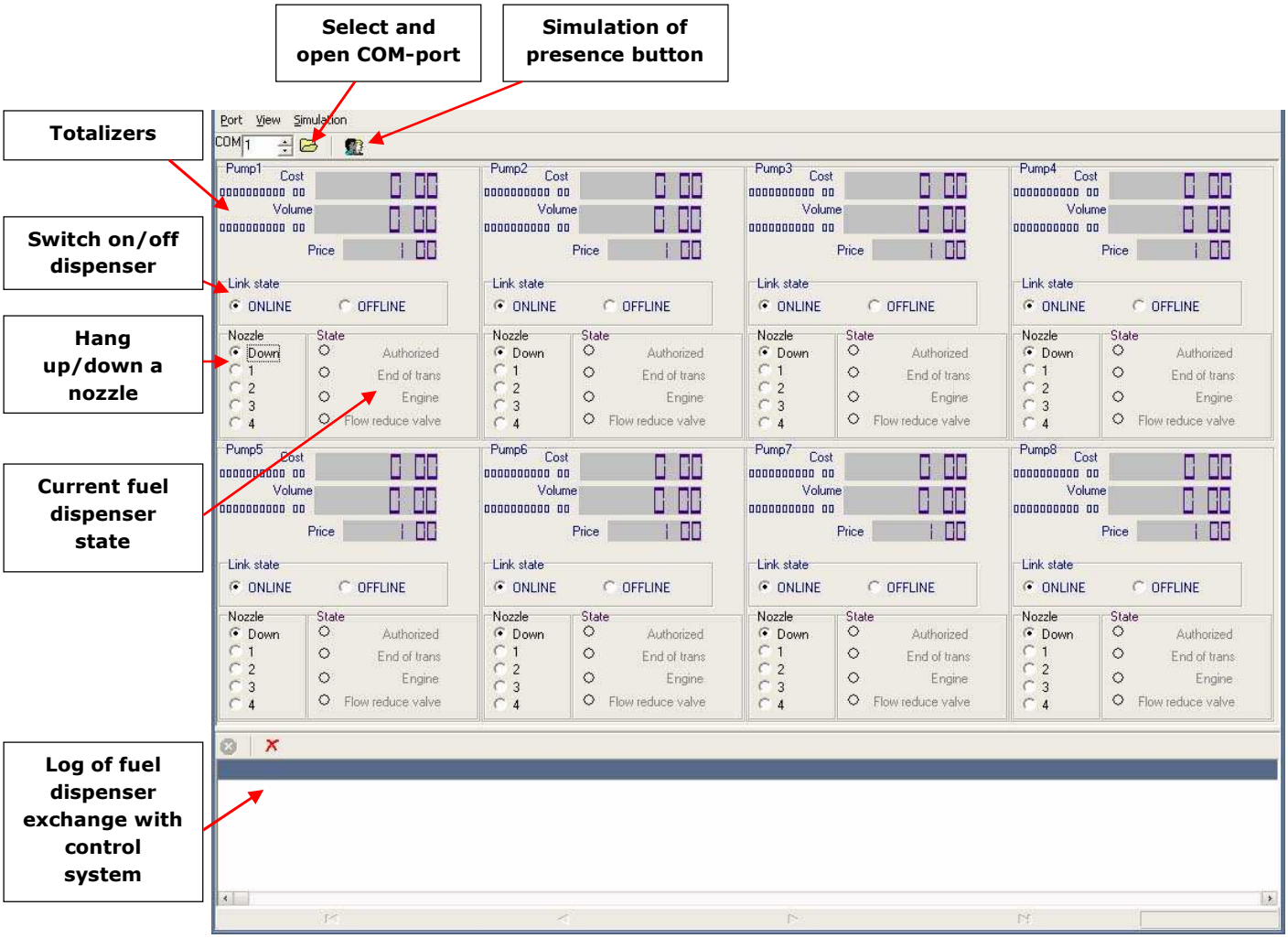
1. Settings of fuel dispensers linking and connection of PTS controller using file setup.bat (same as in NaftaPOS PTS controller driver configuration described above).
2. Configuration of fuel dispenser icons, settings of fuel prices in file AZSDemo.dat.



FUEL DISPENSERS SOFTWARE SIMULATORS

PTS SDK includes fuel dispensers software simulators with a purpose to enable debugging of PTS controller implementation in third party software. Purpose of software simulators is to debug operation of control software over fuel dispensers through PTS controller in the office (without a necessity to connect to real fuel dispensers).

Fuel dispenser software simulators provide simulation of operation with popular fuel dispensers using proprietary communication protocols.

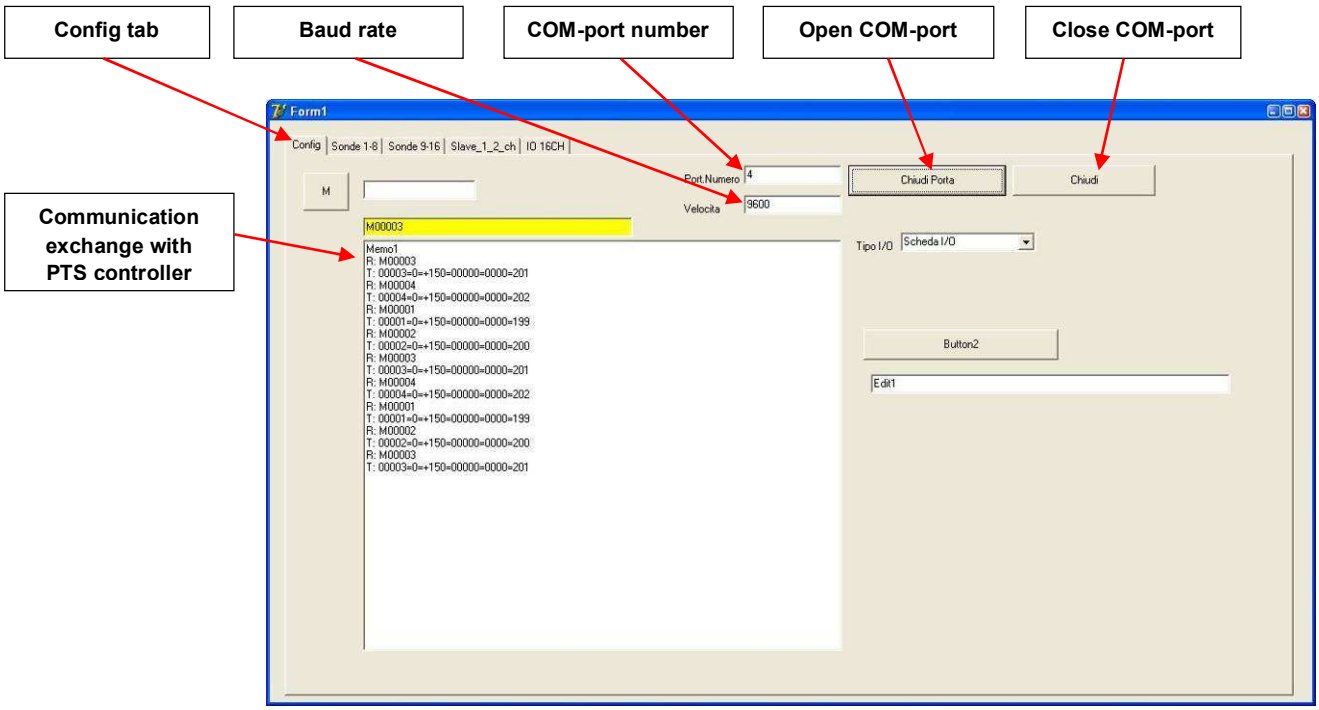


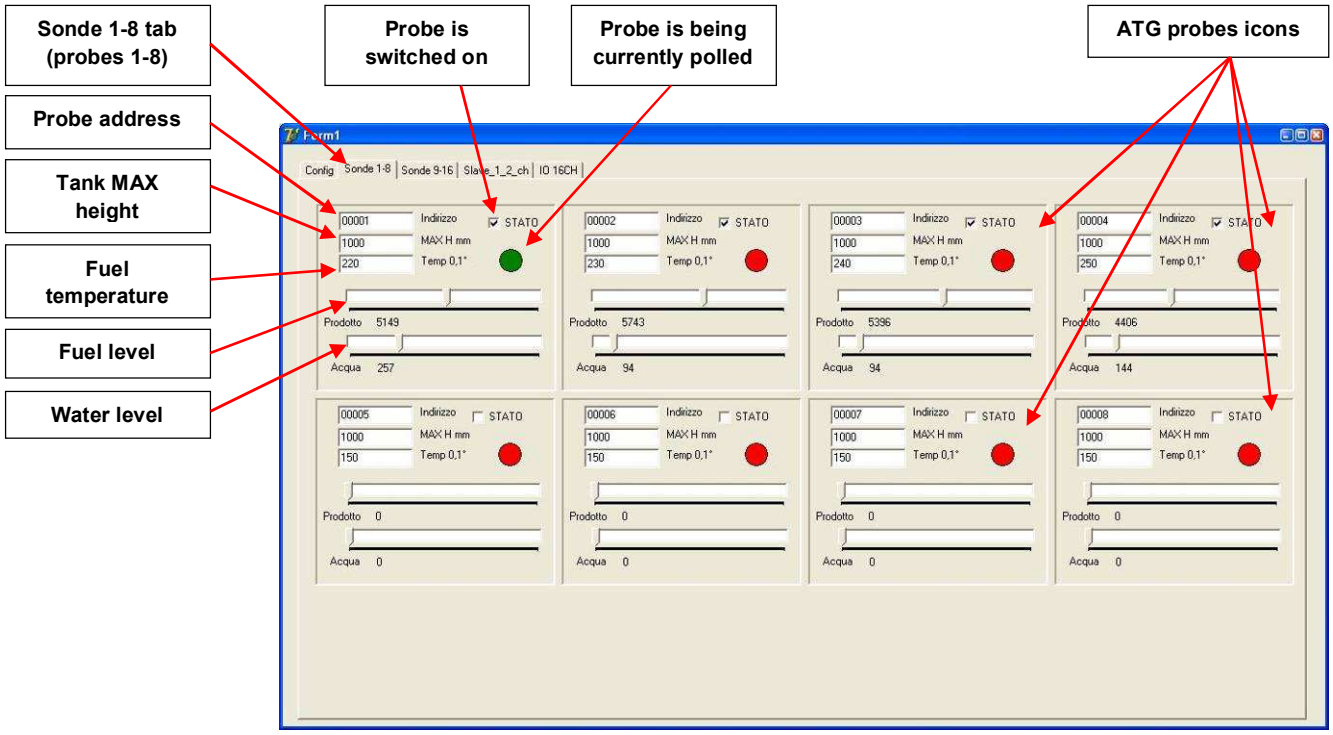
NOTE!

Operation of fuel dispenser software simulators is possible only on PC with a software protection dongle Guardant inserted.

START ITALIANA ATG PROBES SOFTWARE SIMULATOR

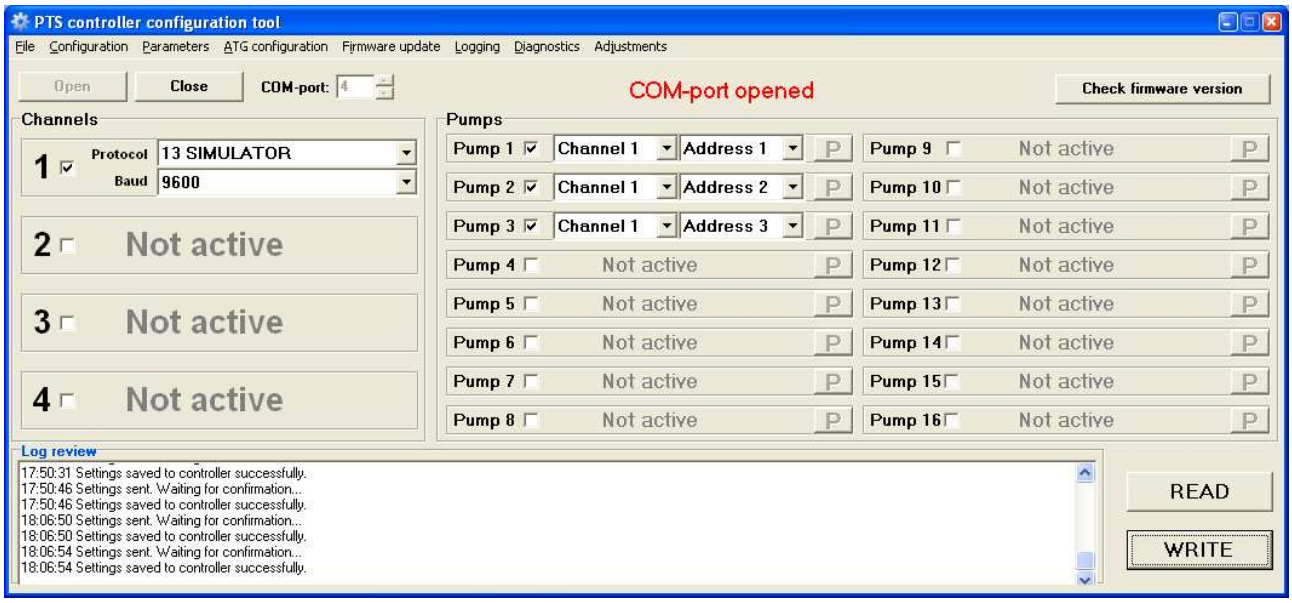
PTS SDK include ATG probes software simulator of Start Italiana. Purpose of the software simulator is to enable debugging of PTS controller and ATG probe at implementation of PTS controller in third party software. Purpose of software simulators is to debug operation of control software over ATG systems through PTS controller in the office (without a necessity to connect to ATG system or probes).





PTS CONTROLLER PUMP SIMULATOR

PTS controller firmware between its pump protocols has a protocol “13 SIMULATOR”, which allows to simulate presence of a fuel dispenser. Baud rate at this can be set to any possible.



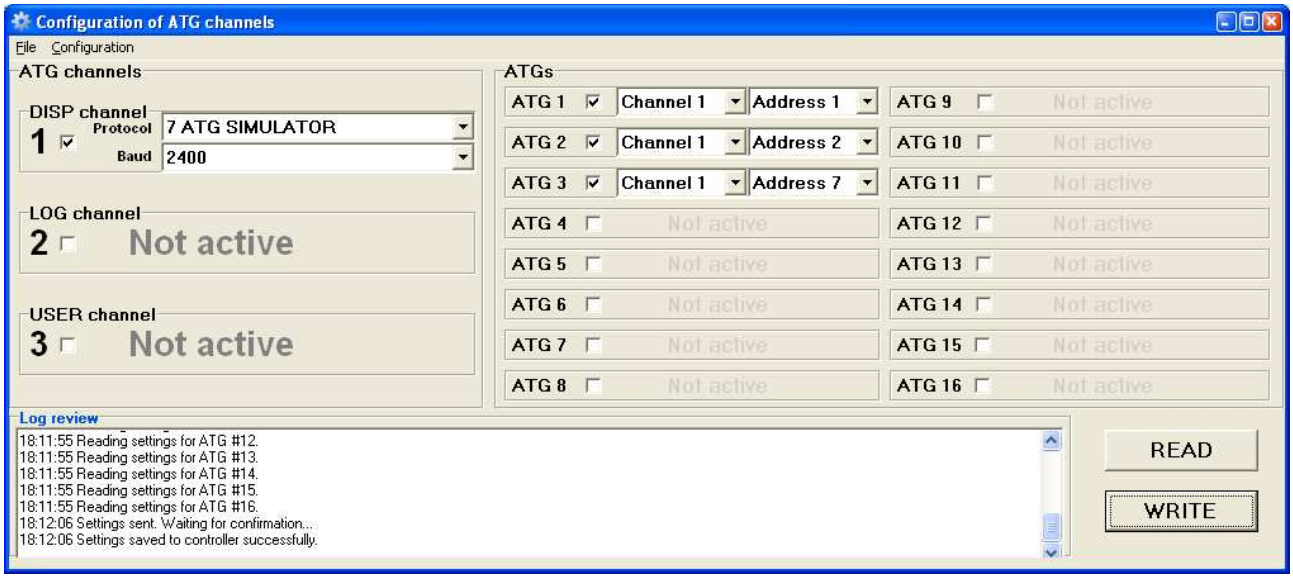
At this the dispenser has only nozzle 1 and it is always taken up.
It is possible to:

- authorize a dispenser with preset volume or amount values
- simulate dispensing of fuel through this dispenser and stop it at necessity
- read total counters values (both amount and volume)
- set prices to dispenser and get prices from dispenser

Purpose of the pump simulator protocol is to help developers in debugging of the control software over PTS controller at absence of real dispenser pumphead for connection or software simulators of fuel dispenser.

PTS CONTROLLER ATG PROBE SIMULATOR

PTS controller firmware between its ATG probes protocols has a protocol "7 ATG SIMULATOR", which allows to simulate presence of connected ATG probe. Baud rate at this can be set to any possible.



At this depending on the selected address of the ATG probe output measurement values will be the following:

For address 1 – dynamically changing all measurement parameters looping in the following sequence:

		Measurement number								
		1	2	3	4	5	6	7	8	9
Measurement parameter	Product level, mm	1000	1250	1500	1750	2000	2250	2500	2750	3000
	Water level, mm	100	125	150	175	200	225	250	275	300
	Product volume, l	8000	10000	12000	14000	16000	18000	20000	22000	24000
	Water volume, l	800	1000	1200	1400	1600	1800	2000	2200	2400
	Temperature, deg. C	11	12	13	14	15	16	17	18	19
	Product temperature compensated volume, l	8500	10500	12500	14500	16000	17500	19500	21500	23500
	Product ullage, l	22000	20000	18000	16000	14000	12000	10000	8000	6000
	Product density, kg/m^3	720	730	740	750	760	770	780	790	800
	Product mass, kg	5760	7300	8880	10500	12160	13860	15600	17380	19200

Duration between changes equals 2 seconds.

For addresses 2-16: statically fixed measurement values:

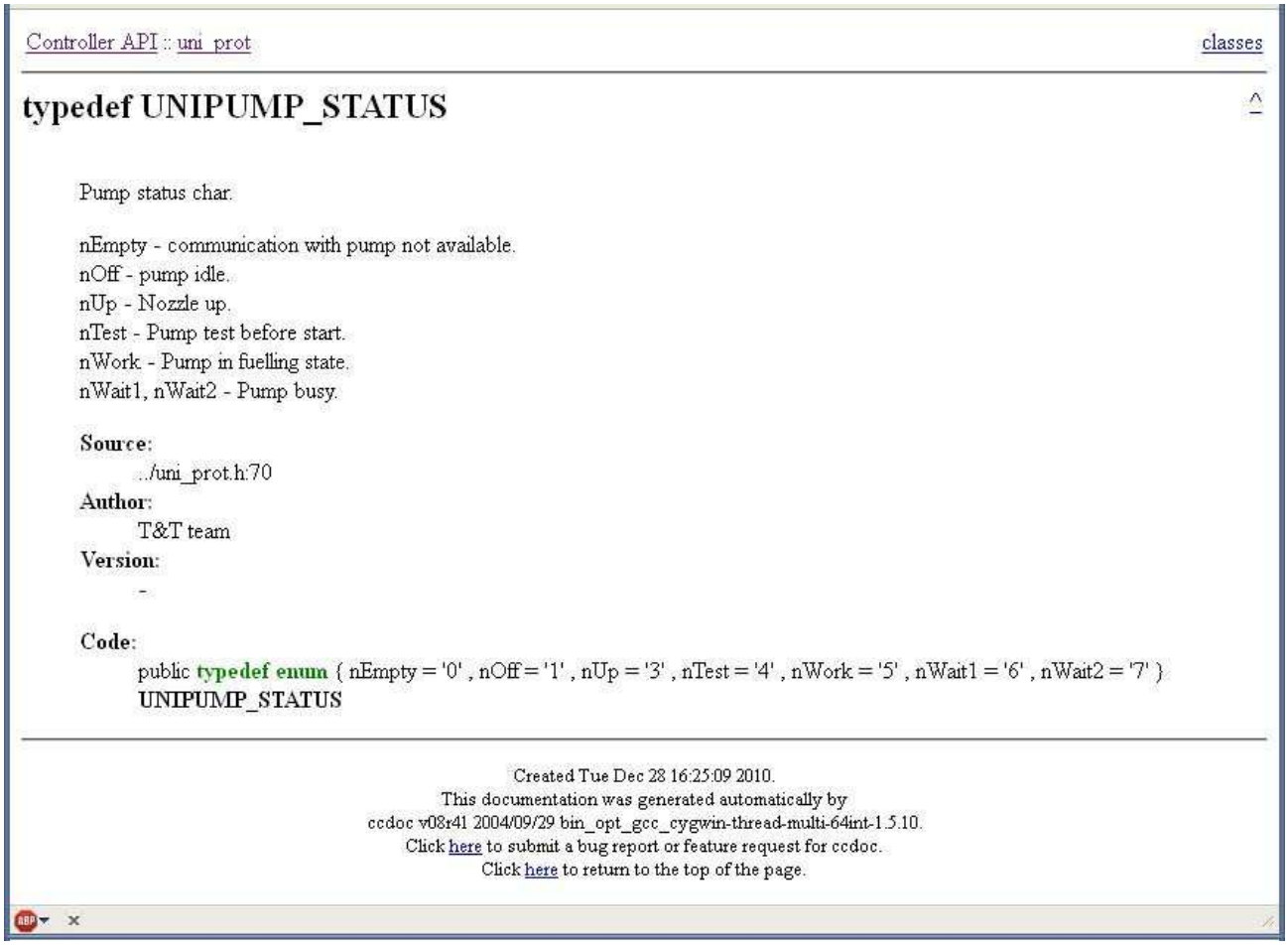
- product level – address + 123.4 mm (example - for address 6: 6123.4 mm)
- water level – address + 56.7 mm (example - for address 9: 956.7 mm)
- temperature – address + .8 deg. C (example - for address 12: 12.8 deg. C)

PTS CONTROLLER API: C LANGUGAGE API WITH EXAMPLES

PTS controller is supplied together with functions written in C language for communication with it and performing of all required actions.

```
/*-------------------------------------------------------------------------*/
int handle_response(UNI_RESPONSE *r)
{
  unsigned char buffer[256];

  if(error(convert_response(r, buffer, sizeof(buffer))))
    return -1;

  switch( ((EMPTY_RESPONSE *)buffer)->code )
  {
    case uAmountInfo:
    {
      AMOUNT_RESPONSE *ar;
      ar = (AMOUNT_RESPONSE *)buffer;
      printf("amount(n:%d,t:%d,v:%d,a:%d)\n", ar->nozzle, ar->trans_no, ar->volume, ar->amount);
      trans_status = idle;
      break;
    }

    case uTransactionInfo:
    {
      TRANSACTION_RESPONSE *tr;
      tr = (TRANSACTION_RESPONSE *)buffer;
      printf("trans(n:%d,t:%d,v:%d,a:%d,p:%d)\n", tr->nozzle, tr->trans_no, tr->volume, tr->amount, tr->price);
      //Close transaction
      printf("Transacrtion %d finished. Volume=%d\n", tr->trans_no, tr->volume);
      printf("trans_close\n");
      trans_close(serial, 0, tr->trans_no);
      trans_status = can_close;
      break;
    }

    case uTotalInfo:
    {
      TOTAL_RESPONSE *tr;
      tr = (TOTAL_RESPONSE *)buffer;
      printf("total(n:%d,t:%d,v:%d,a:%d)\n", tr->nozzle, tr->trans_no, tr->volume, tr->amount);
      break;
    }
```

Description of the API is given in an HTML compiles help file.



Controller API :: uni_prot classes

typedef UNIPUMP_STATUS

Pump status char.

nEmpty - communication with pump not available.
nOff - pump idle.
nUp - Nozzle up.
nTest - Pump test before start.
nWork - Pump in fuelling state.
nWait1, nWait2 - Pump busy.

Source:
../uni_prot.h:70

Author:
T&T team

Version:
-

Code:
public typedef enum { nEmpty = '0' , nOff = '1' , nUp = '3' , nTest = '4' , nWork = '5' , nWait1 = '6' , nWait2 = '7' }
UNIPUMP_STATUS

Created Tue Dec 28 16:25:09 2010.
This documentation was generated automatically by
ccdoc v08r41 2004/09/29 bin_opt_gcc_cygwin-thread-multi-64int-1.5.10.
Click here to submit a bug report or feature request for ccdoc.
Click here to return to the top of the page.

PTS CONTROLLER API: PTS CONTROLLER .NET APPLICATION

Purpose

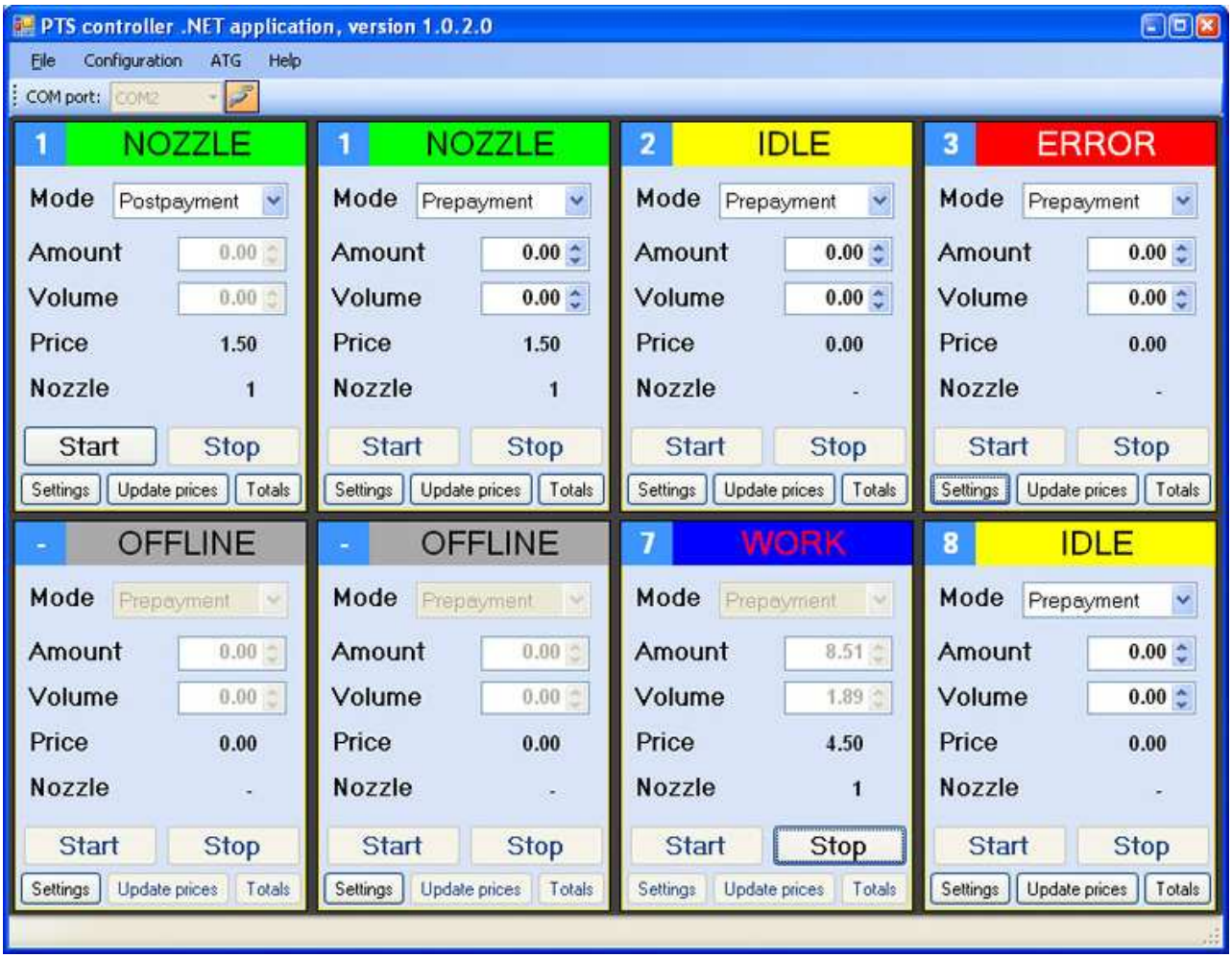
In order to provide control over PTS controller and simplify work of developers, writing on Microsoft .NET Framework in implementation of UniPump communication protocol of PTS controller and give an open source example of application for control over fuel dispensers and ATG systems at petrol station a .NET library (with open source on C# and documentation on methods and properties) and PTS controller .NET application (with open source on C#) are provides.

PTS controller .NET application is intended for developers of software to provide a possibility to easier implement PTS controller over fuel dispensers and ATG systems inside their software by using code of PTS controller .NET application. PTS controller .NET application comes with an open source code.
PTS controller .NET application is based on TiT.PTS.dll library, which contains methods and properties for control over fuel dispensers ATG systems through the PTS controller.
PTS controller .NET application is written on C# language and requires .NET Framework 3.5 for operation.

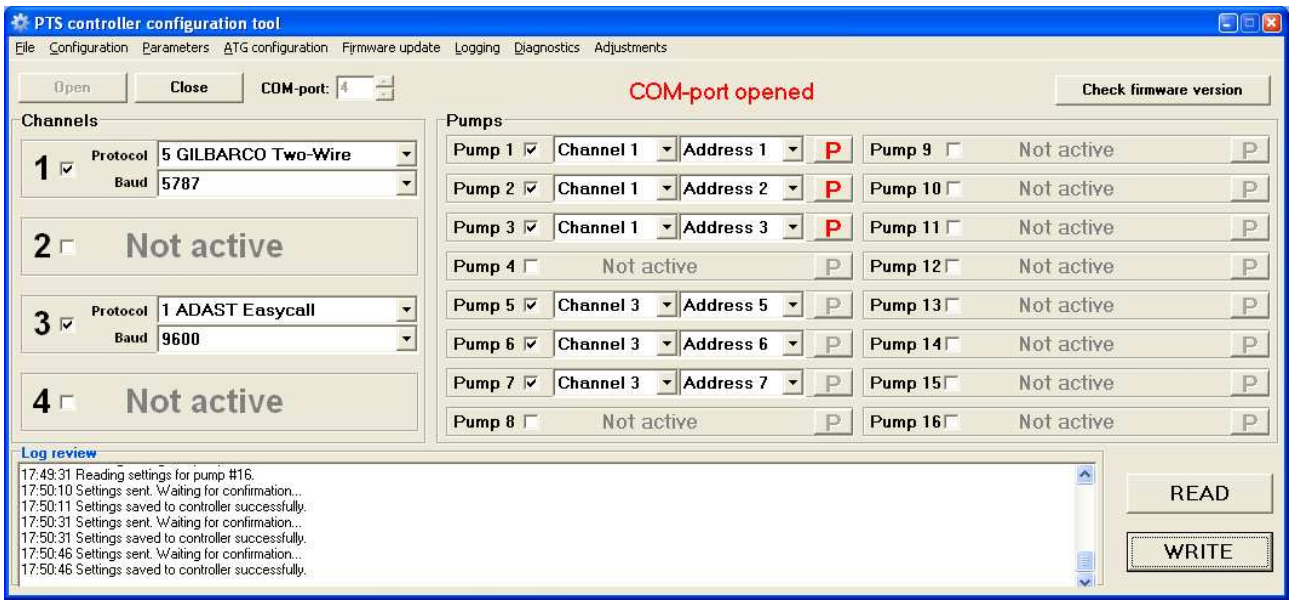
Start

To launch PTS controller .NET application run PtsApplication.exe, select from a dropdown list a COM port name, to which PTS controller is connected, and press a button to open a selected COM port.

Note: connection with PTS controller is made through a 3-wire realization of RS-232 interface, an asynchronous half-duplex channel, baud rate 57600 baud without a parity check. This configuration is hardly coded inside a program.



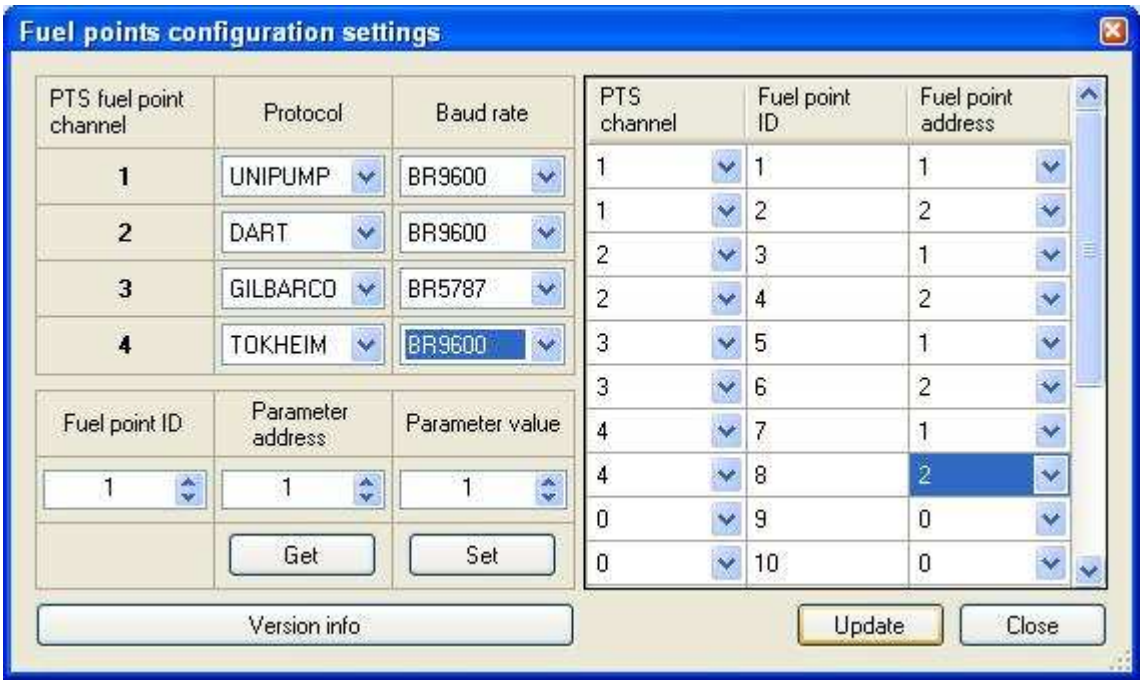
Configuration of PTS controller



Configuration of fuel points

Configuration of PTS controller is made either using built-in configuration forms for pumps and for ATG systems or using a built-in PTS configuration tool (pts_conf).

After establishing a connection with a PTS controller select from top menu "Configuration" an item "Fuel points configuration settings".



In window "Fuel points configuration settings" configuration of connected fuel points to the PTS controller is made:

1. **Configuration of PTS controller pump output channels**

Selection of communication protocols and baud rates for 4 pump output channels.

2. Linking PTS pump output channels with fuel points

Selection of fuel points addresses linking to the PTS controller pump output channels. At this each fuel point address means a physical address configured in the fuel dispenser, fuel point ID means a logical number of a fuel point in the PTS controller.

Maximum quantity of connected fuel points that can be connected to the PTS controller equals to 16. At this up to 16 fuel points can be connected to each of the pump channels of the PTS controller, but not more than 16 fuel points totally connected to all pump channels of the PTS controller.

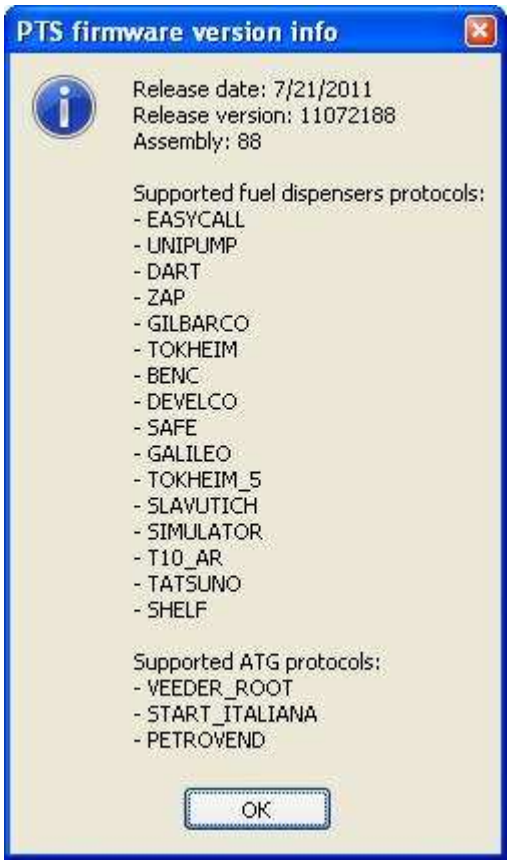
3. Configuration of PTS controller parameters

PTS controller for each of the connected fuel points (IDs from 1 to 16) has configurable parameters, which are used for setting specific configuration of the connected fuel dispensers (like local country currency and price ranges values, quantity of digits, etc). Range of parameters' addresses is from 1 to 32. Values of parameters lay in range from 00000000 to FFFFFFFF. Writing of a parameter in the PTS controller for a specified fuel point ID will set this parameter inside the PTS controller for the specified fuel point ID. Writing of a parameter to a broadcasting fuel point ID (00) will set the parameter for the PTS controller itself. Writing of a parameter with number 00 will cause nulling of all parameters for the specified fuel point ID or the PTS controller itself.

4. Version information of PTS controller

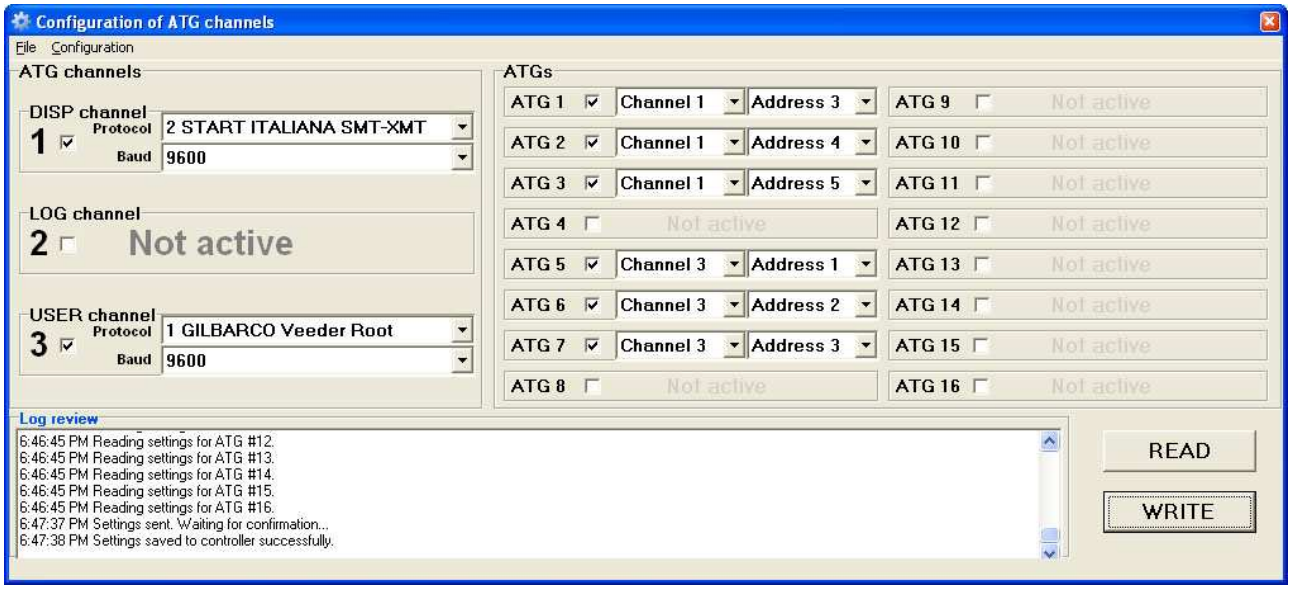
Reading of information from PTS controller about its

- Firmware release date
- Firmware release version
- Firmware release assembly
- Supported fuel dispensers communication protocols
- Supported ATG systems communication protocols

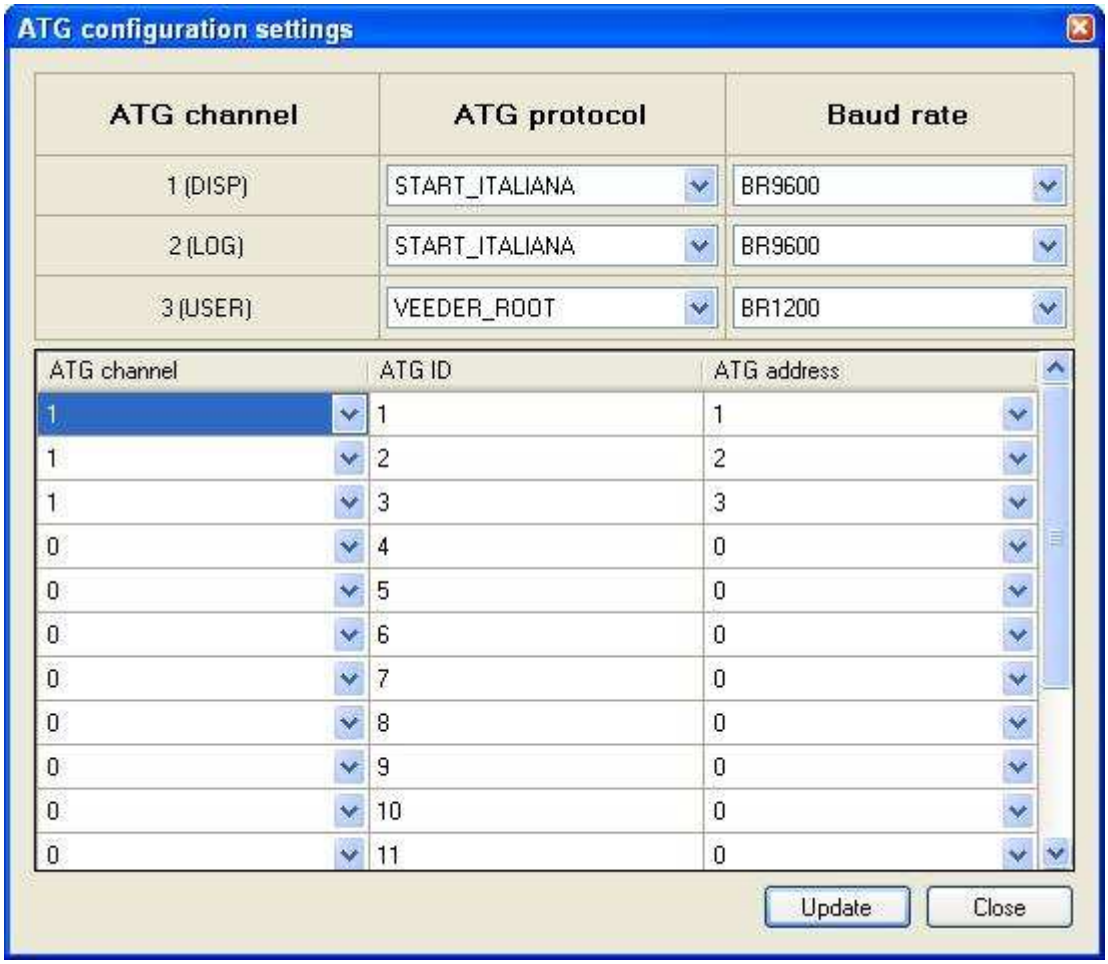


Configuration of connected ATG systems (probes)

Configuration of PTS controller is made either using built-in configuration forms for pumps and for ATG systems or using a built-in PTS configuration tool (pts_conf).



Select from top menu on ATG measurements windows from tab "Configuration" an item "ATG configuration settings".



In window "Fuel points configuration settings" configuration of connected fuel points to the PTS controller is made:

1. Configuration of PTS controller ATG output channels

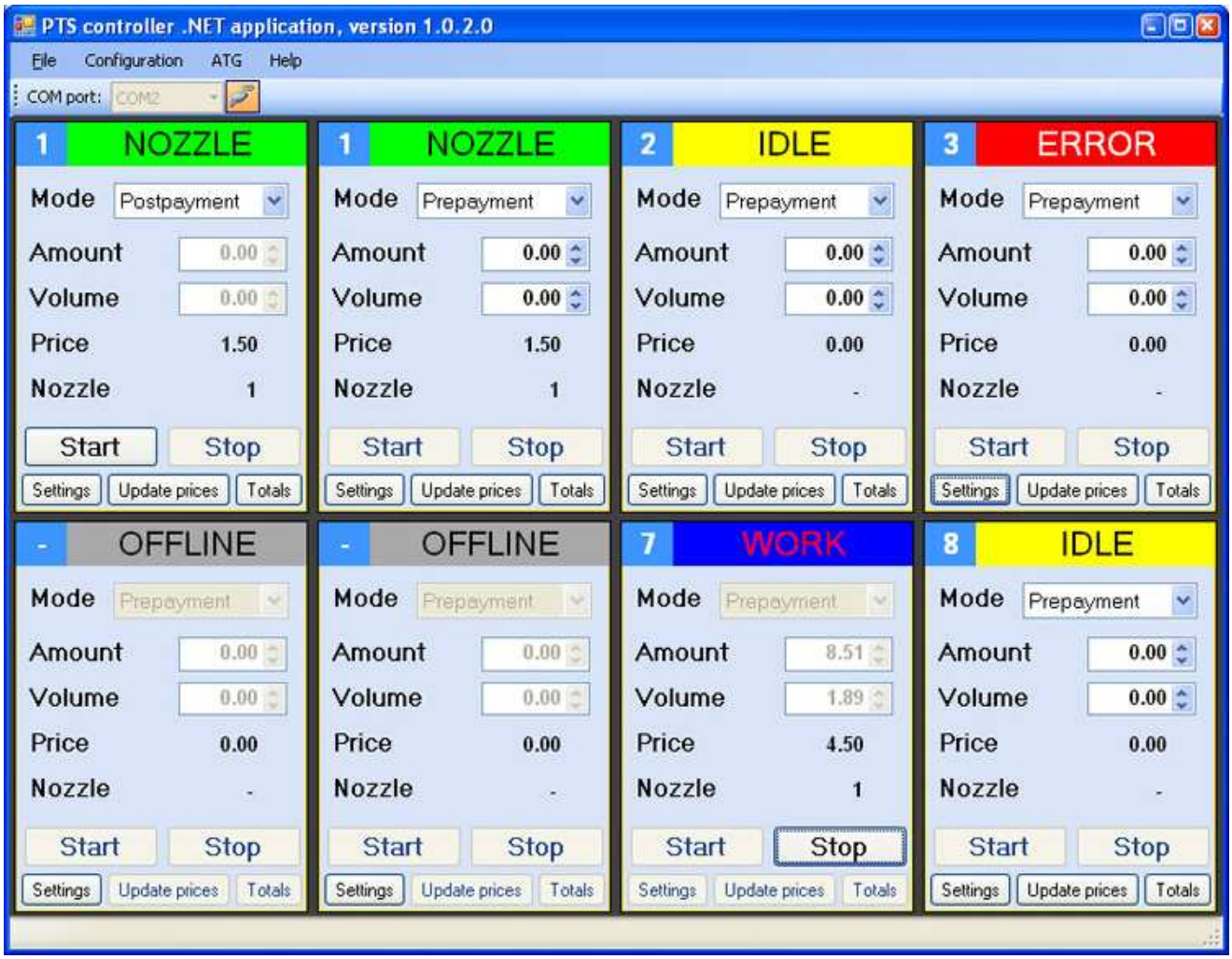
Selection of communication protocols and baud rates for 3 ATG output channels.

2. Linking PTS ATG output channels with ATG systems (probes)

Selection of ATG probes addresses linking to the PTS controller ATG output channels. At this each ATG probe address means a physical address configured in the ATG system (probe), ATG probe ID means a logical number of a ATG probe in the PTS controller.

Maximum quantity of connected ATG probes that can be connected to the PTS controller equals to 16. At this up to 16 ATG probes can be connected to each of the ATG channels of the PTS controller, but not more than 16 ATG probes totally connected to all ATG channels of the PTS controller.

Main view



In main view 8 fuel point icons are shown on the screen, which are to be linked to physical fuel points and show its state.

Each of the displayed fuel point icons contains information about:

- **Fuel point ID** - a logical number of a fuel point in PTS controller (number displayed in top left corner, displaying with a symbol "-" means a fuel point not set)
- **Status –** status of a fuel point (displayed in a top line)

- **Mode** – selection between Prepayment mode (required to specify money amount or volume of fuel to be dispensed) and Postpayment mode (does not require to specify money amount or volume of fuel to be dispensed)
- **Amount** – money amount for which a fuel dispensing should be made (in a range 0,00 – 9999,99)
- **Volume** – fuel volume for which a fuel dispensing should be made (in a range 0,00 – 9999,99)
- **Price** – price per 1 liter/gallon of fuel
- **Nozzle** – number of an active nozzle that is taken up (displaying with a symbol "-" means no nozzle is taken up)

Possible statuses of fuel points:

- **OFFLINE** – fuel point is not active, is not set or is controlled in a manual mode
- **IDLE** – fuel point is in idle state (all nozzles are hang down)
- **NOZZLE** – nozzle is taken up, waiting for allowance on fuel dispensing
- **READY** – fuel dispensing is allowed, test of indicator is running
- **WORK** – fuel dispensing is in process
- **TransactionCompleted** – transaction is finished normally, waiting for a nozzle to be hang down
- **TransactionStopped** - transaction is finished abnormally, waiting for a nozzle to be hang down
- **ERROR** – Status of an error

Each of the fuel point icons contains the following buttons:

1. **Start** – start of fuel dispensing (fuel point authorization)
2. **Stop** – stop of fuel dispensing
3. **Settings** – opens a window for setting of fuel point icon configurations
4. **Update prices** – clicking leads to setting of prices per 1 liter/gallon of fuel for all nozzles of a fuel point with which current fuel point icon is linked
5. **Totals** – opens a window for reading of fuel point totalizers

Settings of fuel point icons

Given window contains a dropdown list with all 4 pump channels of the PTS controller, selecting each of which leads to displaying of all fuel points' IDs and corresponding fuel points' addresses configured to given pump channel for a PTS controller in a field below. Selecting one of the fuel point IDs and pressing OK button leads to linking given fuel point icon to selected fuel point ID and displaying its status. Selecting of a PTS pump channel with value 0 will lead to switching off a fuel point icon.

Given window for each of the fuel points also contains a list of 6 nozzles for setting of prices per 1 liter/gallon of fuel, dispensed through these nozzles, in a range 0,00 – 99,99. If a fuel point has less than 6 nozzles – prices will be set only for first number of nozzles, which a fuel point has.

Clicking 'Set prices' button leads to updating prices on selected fuel point. Clicking 'Get prices' leads to receiving of prices from selected fuel point.

Clicking OK button leads to updating a fuel point icon and updating (creating) a file "Config.xml" in root folder with configuration of fuel point icons. At launching of a PTS controller .NET application next time configuration of fuel point icons will be read from this file "Config.xml" in root folder.

Reading of fuel point totalizers

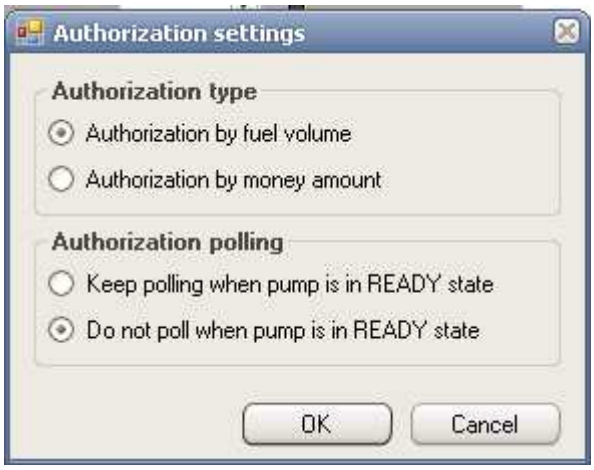
Selecting of a button "Totals" on a fuel point icon and clicking a button Update in it leads to reading of totalizers from a selected fuel point.

Authorization settings

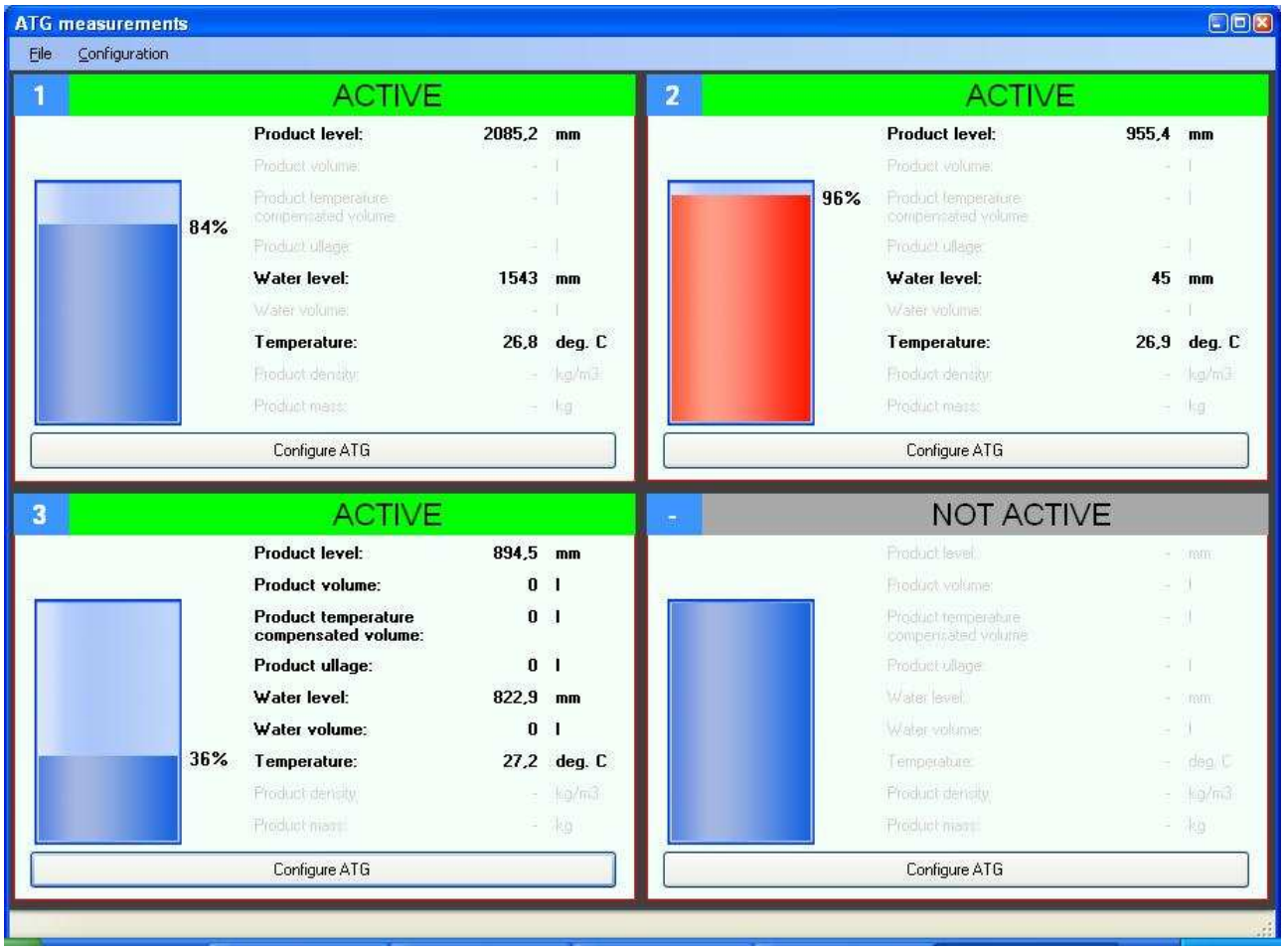
Selection from top menu "Tools" an item "Authorization settings" leads to opening a new window, which allows adjustment of

1. Authorization type of fuel dispensers:
- **Authorization by fuel volume** – used for most fuel dispensers
- **Authorization by money amount** – used for old and rare fuel dispensers

2. Authorization polling:
- **Keep polling when pump is in READY state** – keep sending authorization in READY state (until nozzle is taken up of fuel point and it is authorized)
- **Do not poll when pump is in READY state** – send authorization only once at clicking on a 'Start' button of fuel point icon



Displaying ATG systems probes states



In ATG view 4 ATG icons are shown on the screen, which are to be linked to physical ATG systems (probes) and show its state.

Each of the displayed ATG icons contains information about measured by ATG system (probe) parameters of petroleum product inside tanks. Depending on the type (communication protocol)of ATG system (probe) the following data may be displayed:

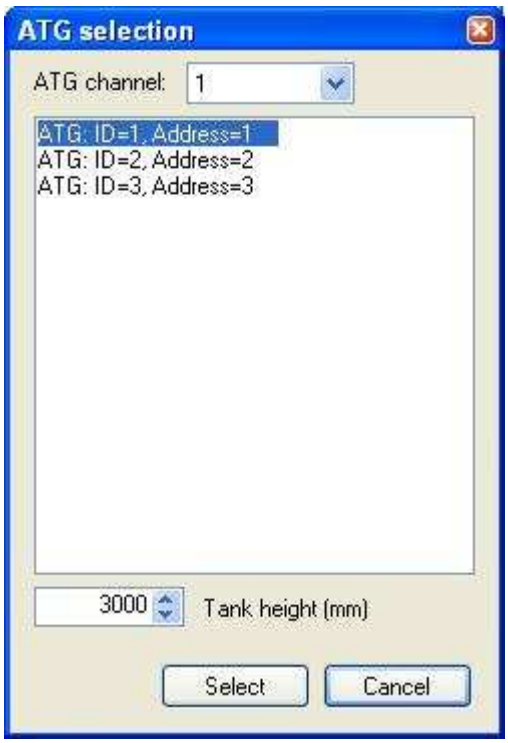
- **Product level** (accuracy 0.1 mm)
- **Product volume** (accuracy 1 liter)
- **Product temperature compensated volume** (accuracy 1 liter)
- **Product ullage (volume)** (accuracy 1 liter)

- **Water level** (accuracy 0.1 mm)
- **Water volume** (accuracy 1 liter)
- **Temperature** (accuracy 0.1 degree Celcium)
- **Product density** (accuracy 0.1 kg/m^3)
- **Product mass** (accuracy 0.1 kg)

If ATG system does not support any the parameters – a correspondent value label on ATG icon stays disabled.
Picture of a tank on the ATG icon shows visually level of product in tank compared to tank height (which should be equal to ATG probe height).

If ATG icon is linked with an ATG system – its state is “ACTIVE”, else – “NOT ACTIVE”.

Settings of ATG probe icons

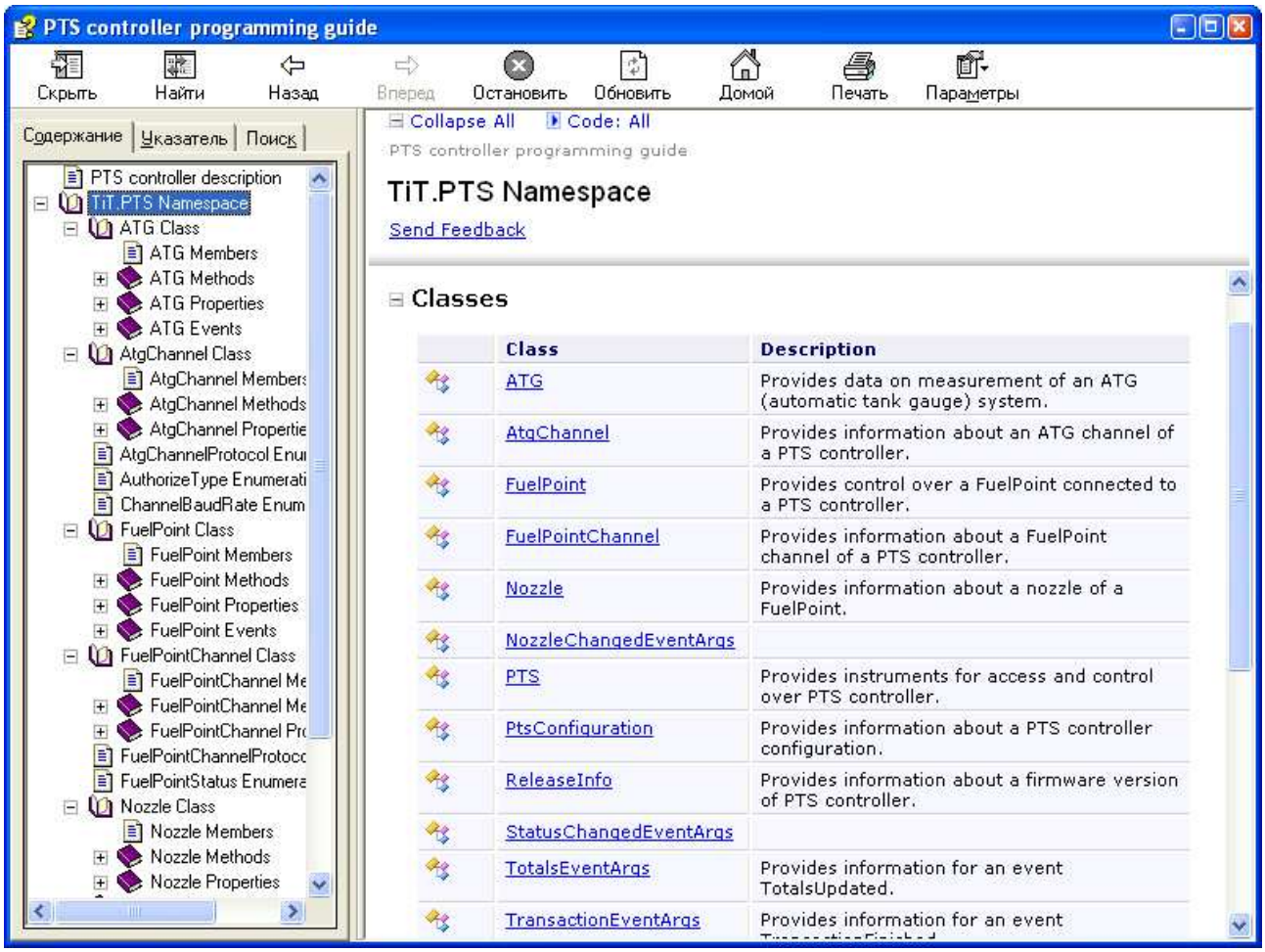


Given window contains a dropdown list with all 3 ATG channels of the PTS controller, selecting each of which leads to displaying of all ATG probes’ IDs and corresponding ATG probes’ addresses configured to given ATG channel for a PTS controller in a field below. Selecting one of the ATG probe IDs and pressing OK button leads to linking given ATG probe icon to selected ATG probe ID and displaying its state. Selecting of a PTS ATG channel with value 0 will lead to switching off a ATG probe icon.

Given window for each of the ATG probes also contains a field for entering height of a tank with installed probe (which is considered to be a maximum level of product allowed for given tank).

TiT.PTS classes help file

PTS controller .NET application is based on a number of classes which documentation describing methods and properties is supplied together with it.



PTS CONTROLLER API: PTS COM-OBJECT

In order to provide control over PTS controller and simplify work of developers, writing on Microsoft Visual Studio in implementation of UniPump communication protocol of PTS controller a COM-object with methods and properties for operation with PTS controller is provided.

COM-object is compiled on Visual C++ 6.0 and is supplied together with a test application, written on Visual Basic 6.0.

Documentation of COM-object describes all methods and properties of the COM-object and its application.

PTS controller COM interface manual

"TECHNOTRADE LTD"
www.technotrade.ua

Commands:

Open PTS device

pts_open()

in properties:
pts_portnum - COM port number
pts_portspeed - COM port baud rate

return values:
success: device id (not 0)
failed: 0 (see pts_error and pts_errorstring properties)

Close PTS device

pts_close()

return values:
success: 1
failed: 0 (see pts_error and pts_errorstring properties)

Set config of device

pts_setconfig
(only after pts_setconfigchannel and pts_setconfigpump)

return values:
success: 1
failed: 0 (see pts_error and pts_errorstring properties)

To register PTSDriver.dll library in Windows OS perform command

```
REGSVR32 PTSDriver.dll
```

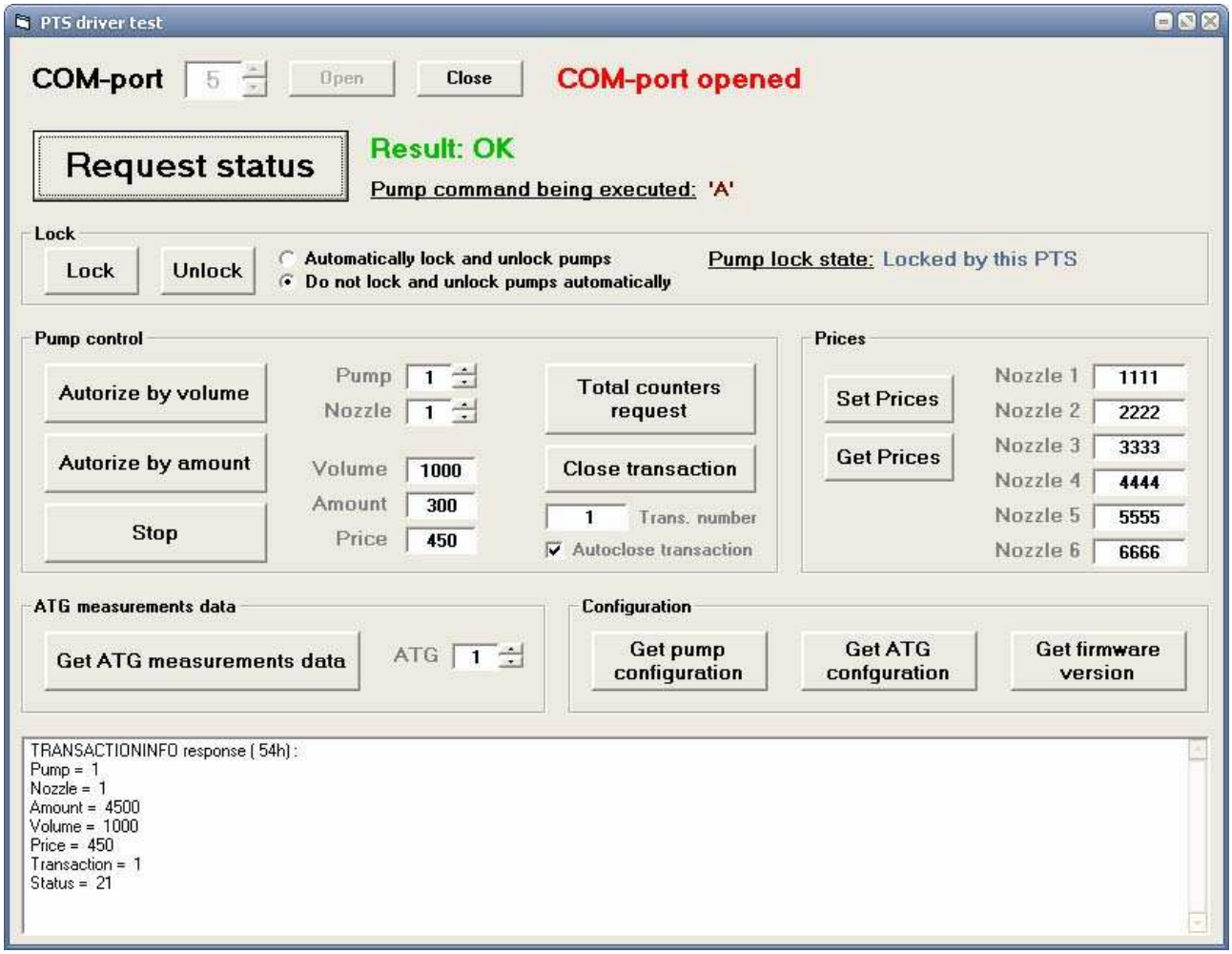
from PTS_SDK\API TOOLS\PTS_COM_object\PTS_COM_OBJECT\PTSDriver\Debug\ folder.

PTS CONTROLLER API: VB APPLICATION ON BASIS OF PTS COM-OBJECT

Purpose

In order to provide control over PTS controller and simplify work of developers, writing on Visual Basic programming language in implementation of PTS controller into their software an open source visual basic application is provided. This VB application is written on VB 6.0 and uses PTS COM-object to provide control over PTS controller. It supports all commands from UniPump communication protocol of PTS controller and gives examples for testing of all functions provided by the PTS controller.

Thus developers on VB language can view how control over PTS controller is provided and implement the same functions in own developed POS applications for petrol stations.

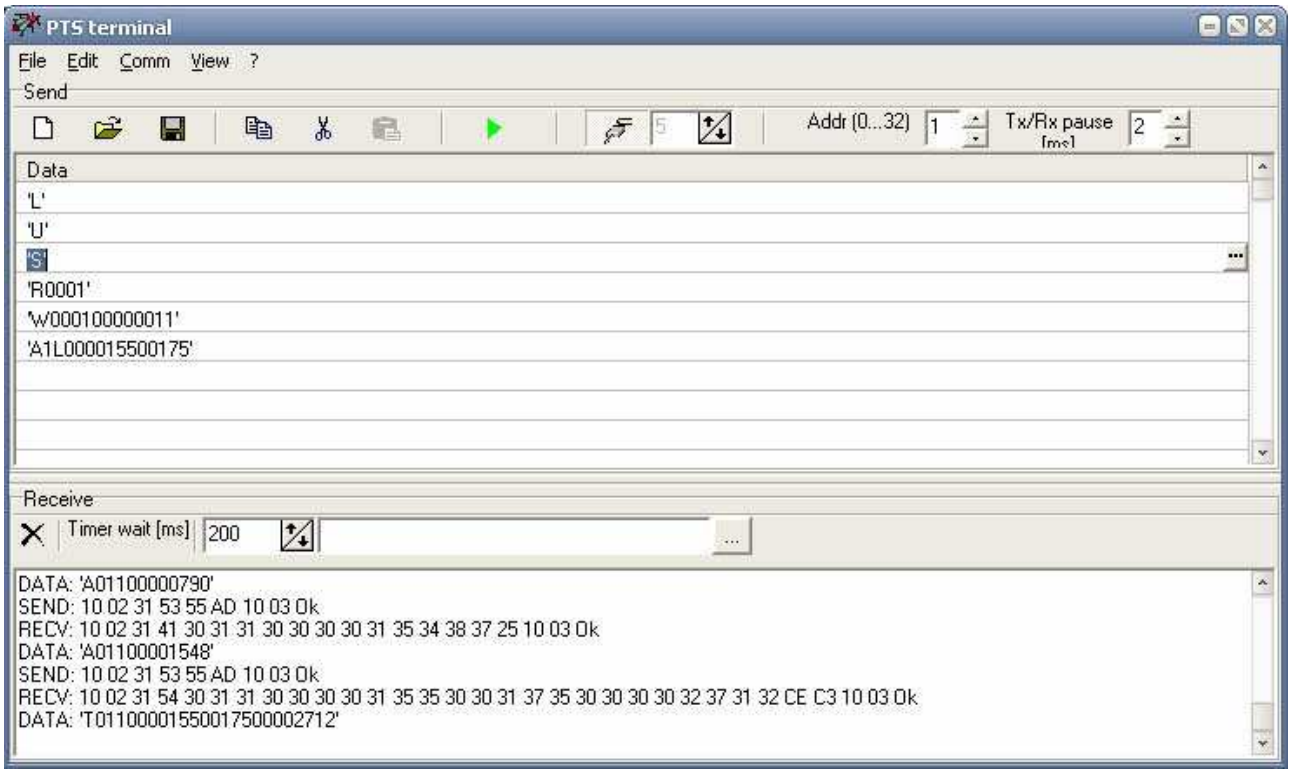


PTS CONTROLLER TOOLS: PTS TERMINAL

Purpose

In order to provide debugging of PTS controller operation a PTS terminal is provided. It allows to send to PTS controller requests formed by bytes in accordance with UniPump communication protocol commands without a necessity to add framing bytes and CRC.

Thus developers during development of own POS system software can test sending of packages to PTS controller and receive PTS responses and in such a way compare with own developed POS application.



PTS CONTROLLER SDK: STEP-BY-STEP CONFIGURATION

Purpose

In order to simplify understanding of PTS controller SDK operation and assembling this step-by-step instruction is provided. It describes basic steps to be made with PTS controller SDK to assemble it correctly and also to install and configure software coming in its structure.

Step 1. Downloading of PTS controller SDK software

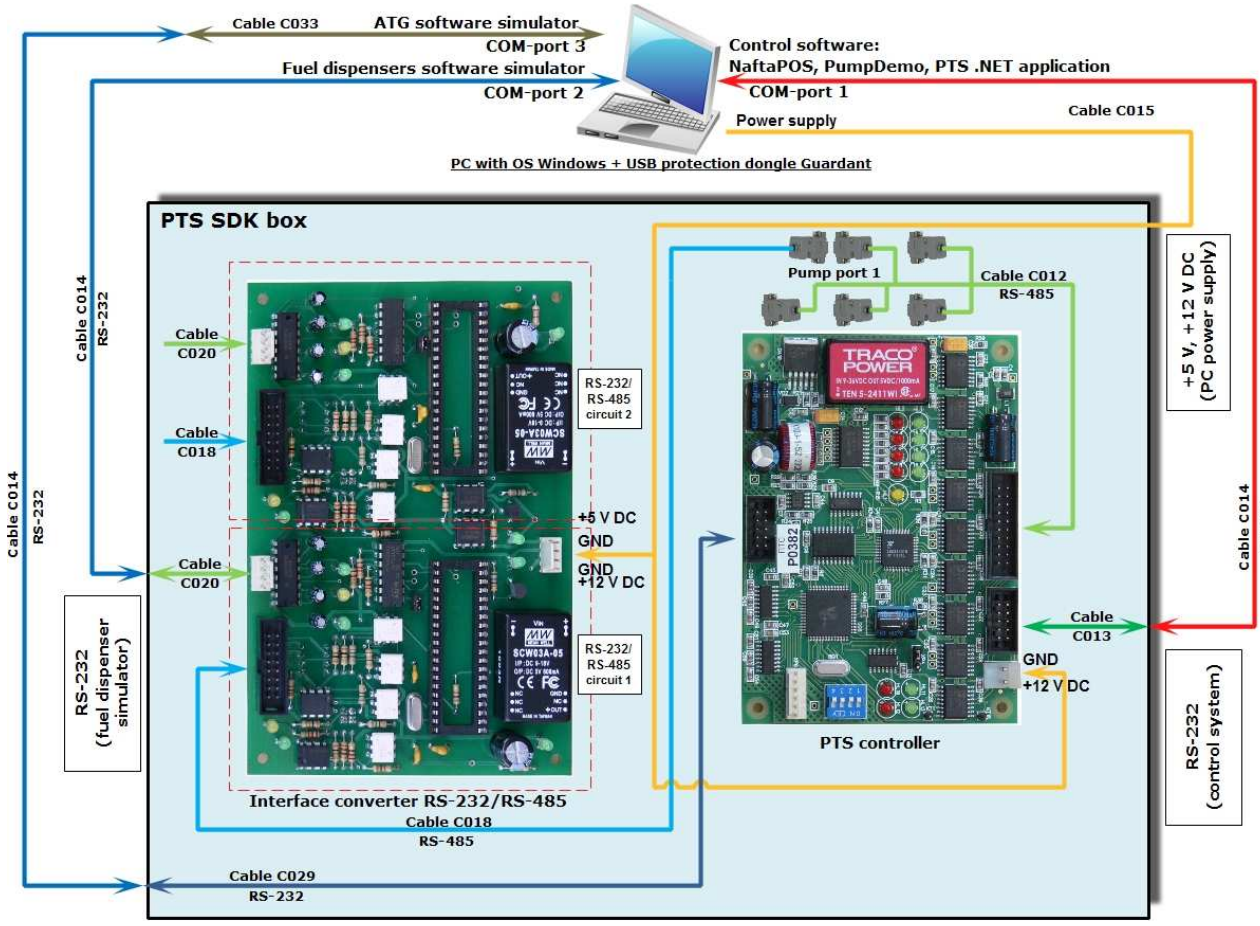
Using a link for download of PTS controller SDK software it is necessary to get all files from it. The files should include:

- API tools
  - Open source PTS NET application with documentation
  - Open source PTS COM-object with documentation
  - Open source VB test application
  - Open source C language API for PTS controller
  - UniPump communication protocol description for PTS controller
- Software tools
  - NaftaPOS software for petrol stations
  - PumpDemo util
  - PTS controller configuration tool (pts_conf)
  - PTS terminal
  - USB dongle drivers
- Software simulators
  - Fuel dispensers software simulators
  - ATG systems (probes) software simulators
- Documentation
  - User manuals
  - Technical guides

Step 2. Assembling PTS controller SDK scheme and connection to PC

For connection of PTS controller SDK cabling it is necessary to have at least 2 COM-ports available in PC (one COM-port – for control system, other COM-port – for fuel dispenser software simulator or ATG probe software simulator). It is recommended to use at least 1 native COM-ports in the PC (built in a PC motherboard), but in case of their absence it is possible to use standard USB-to-COM interface converter cables, having configured COM-port driver to use FIFO settings: Tx = 1, Rx = 1.

Scheme of connections should be the following:



So, PTS controller is to be connected to a COM-port of the PC using cable C013 (cable C013 comes mounted to the PTS SDK box with inscription “RS-232 (control system)”). Connection can be made through a cable C014, which serves as a prolonger of the COM-port.

RS-232/RS-485 interface converter board serves for connecting of PTS controller pump channels (in RS-485 interface) with COM-port of PC (in RS-232 interface), on which fuel dispensers software simulators are to be launched. RS-232/RS-485 interface converter board has 2 independent conversion circuits. Input cable is C018 (RS-485 interface), output cable is C020 (RS-232 interface).

Due to a reason that in this description we will configure only channel 1 of PTS controller to communicate with fuel dispensers – it is necessary to connect the connector X1 of cable C012 coming from the pump port of the PTS controller to a cable C018 of the RS-232/RS-485 interface converter board. Output cable C020 of the same conversion circuit of the interface converter (one of cables C020 comes mounted to the PTS SDK box with inscription “RS-232 (fuel dispenser simulator)”) is to be connected to the COM-port of PC, on which fuel dispensers software simulator is launched. Connection can be made through a cable C014, which serves as a prolonger of the COM-port.

In order to connect ATG systems (probes) software simulators it is necessary to connect one of the connectors of cable C029 through a cable C033 to the COM-port of PC with launched ATG system (probes) software simulator. Connection can be made through a cable C014, which serves as a prolonger of the COM-port. In this description we will use USER-port of PTS controller to connect ATG probes software simulator, so it is necessary to connect USER connector to cable C033 (directly or through cable C014). C033 cable should be connected to COM-port of the PC.

It is worth to mention that only 1 application can work with a specific COM-port at the time, 2 applications can not work with the same COM-port.

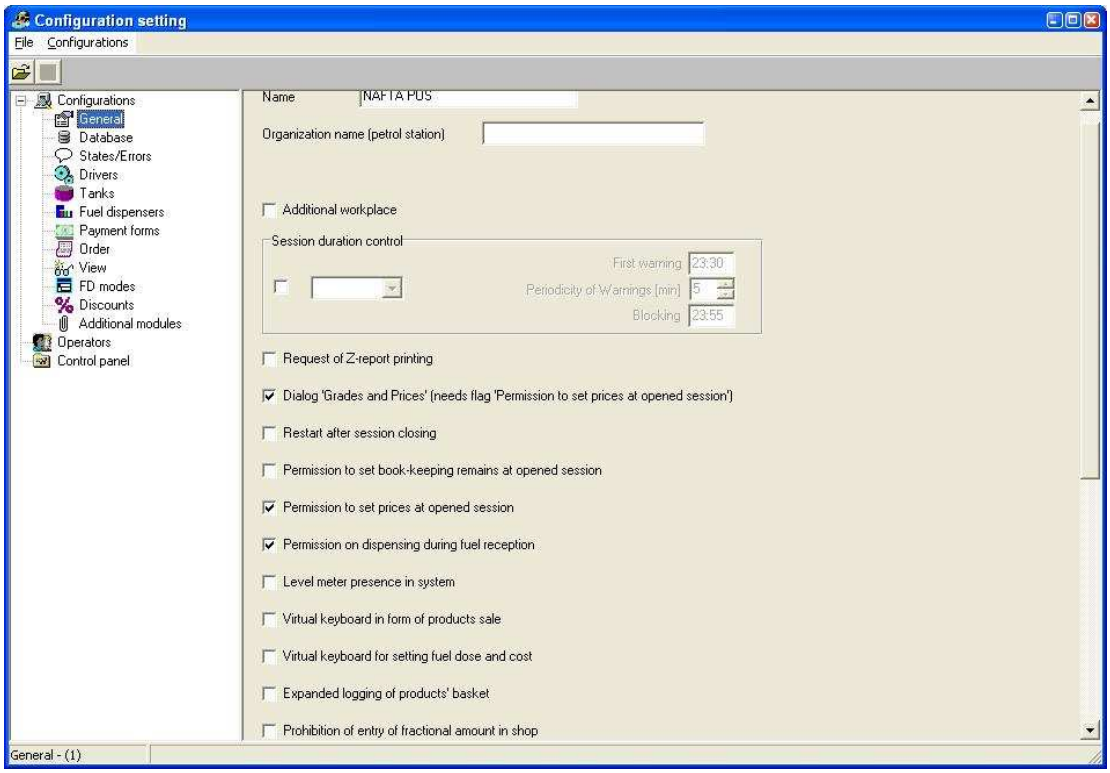
Step 3. Installation of NaftaPOS software for petrol stations

Using instructions given in point "NAFTAPOS SOFTWARE FOR PETROL STATIONS" of given technical guide it is necessary to download and install NaftaPOS software. During installation of NaftaPOS software Guardant USB dongle drivers are to be installed.

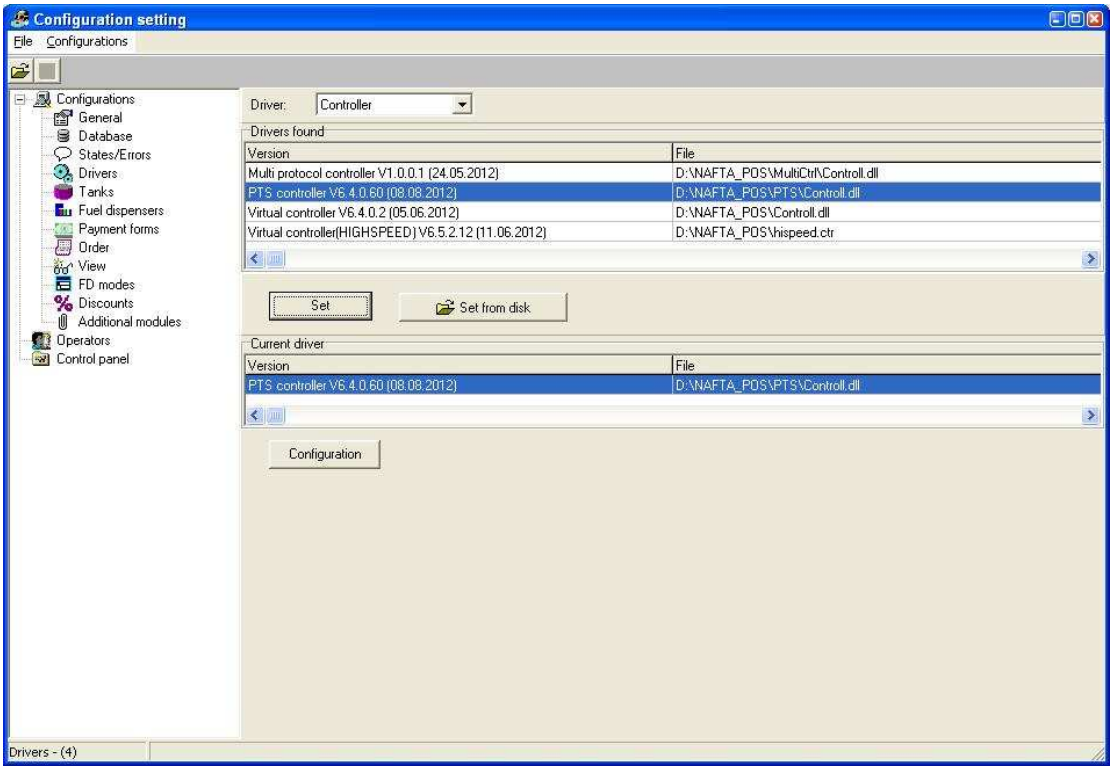
Step 4. Configuration of NaftaPOS software and PTS controller to use built-in simulator of fuel dispensers and ATG probes in PTS controller

Run POSSet configuration tool of NaftaPOS software (D:\NAFTA_POS\POSSet.exe).

Set the following configuration on tab 'General':

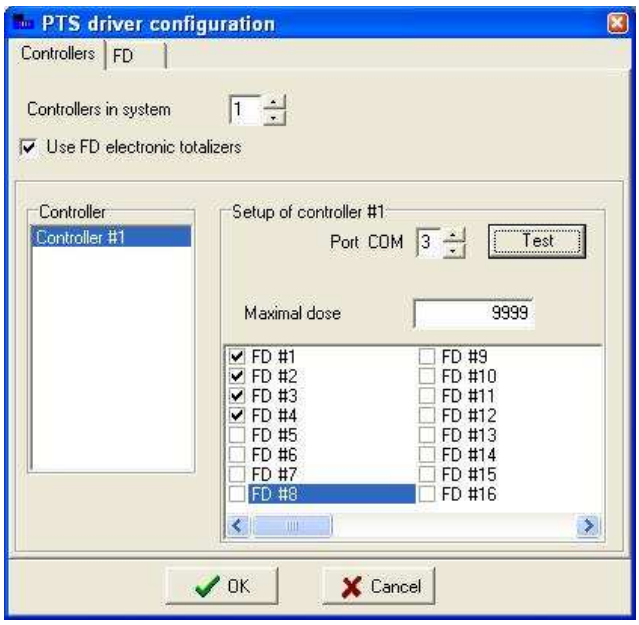


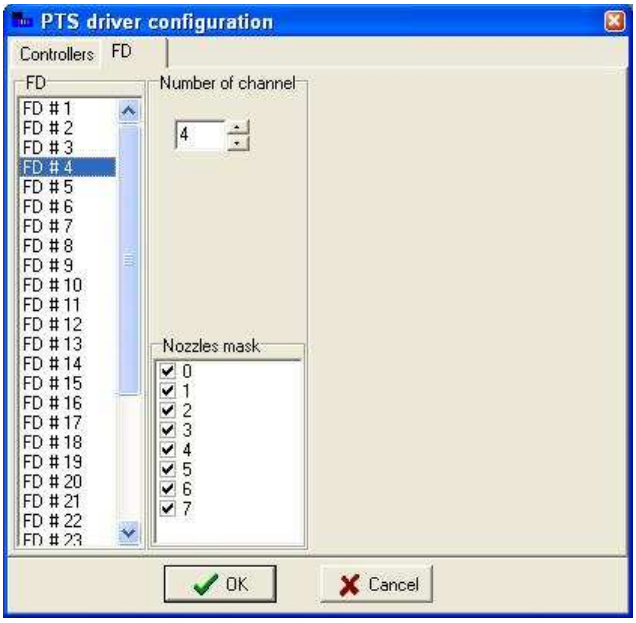
Select a tab 'Drivers' and set as a driver of controller 'PTS controller' driver:



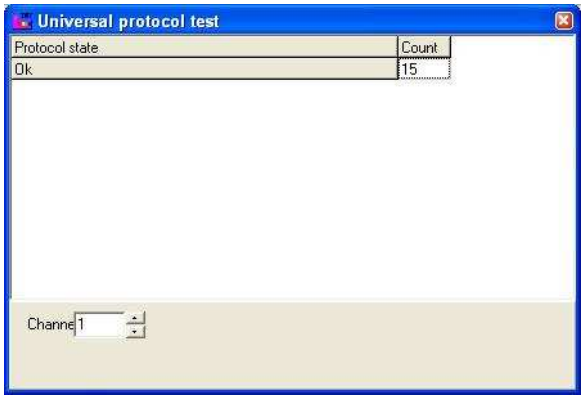
In configuration of the ‘PTS controller’ driver set the following adjustments:

- Quantity of fuel dispensers equal to 4
- COM port number of connected PTS controller
- Read electronic totalizers
- Number of channel of each fuel dispenser (FD) should be equal to FD number:
    - FD #1 – Number of channel 1
    - FD #2 – Number of channel 2
    - FD #3 – Number of channel 3
    - FD #4 – Number of channel 4

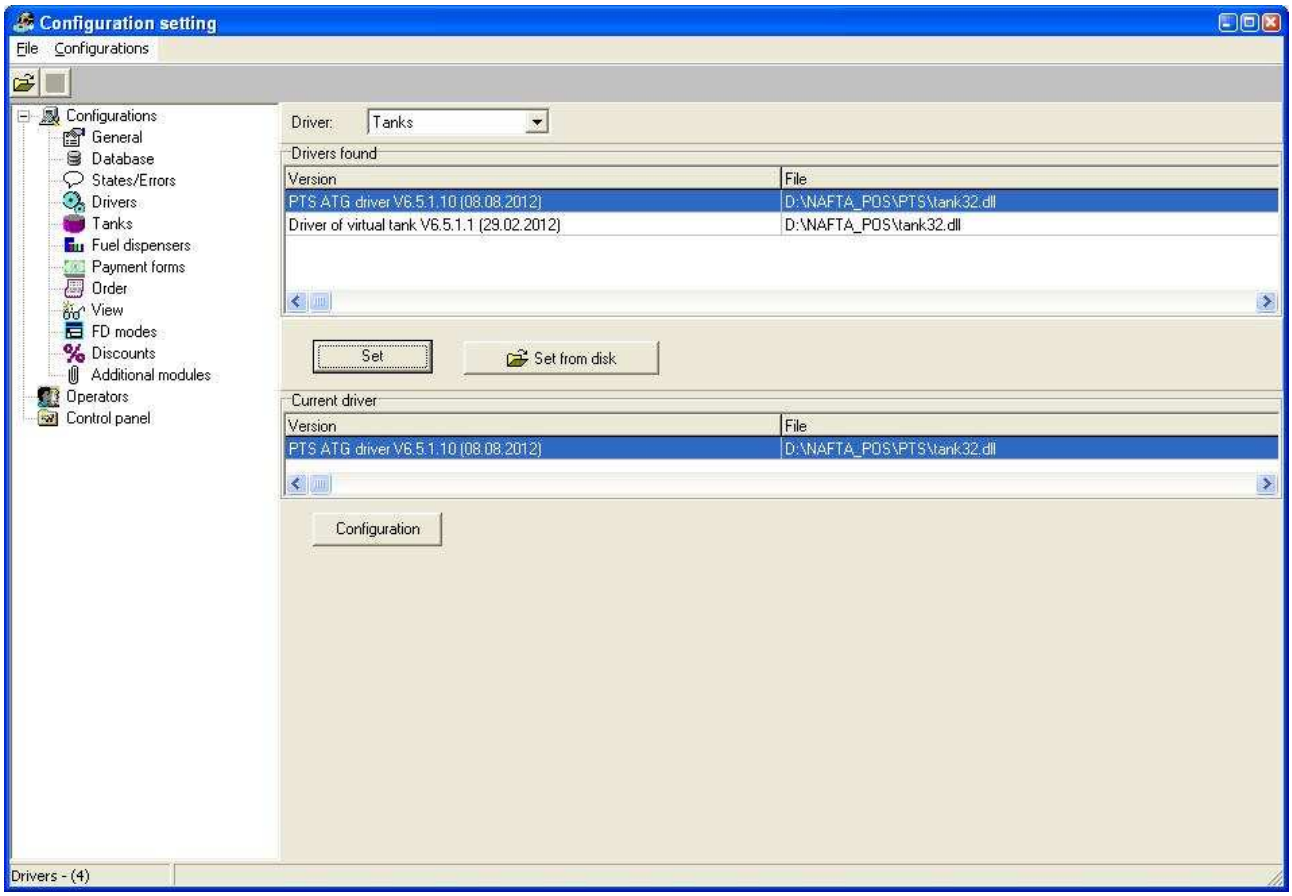




At pressing a button ‘Test’ there should be successful exchange with PTS controller:

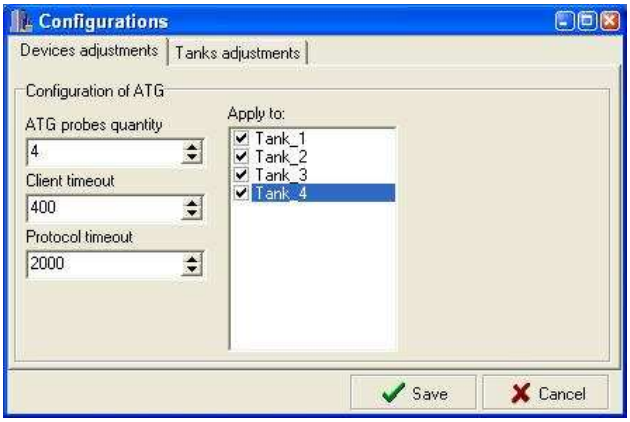


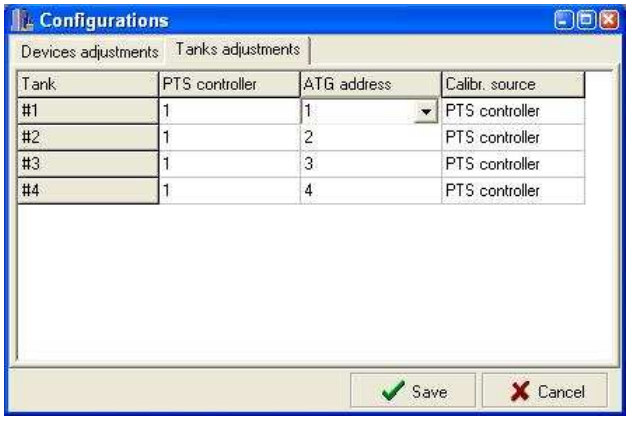
Select a tab ‘Drivers’ and set as a driver of tanks ‘PTS ATG driver’:



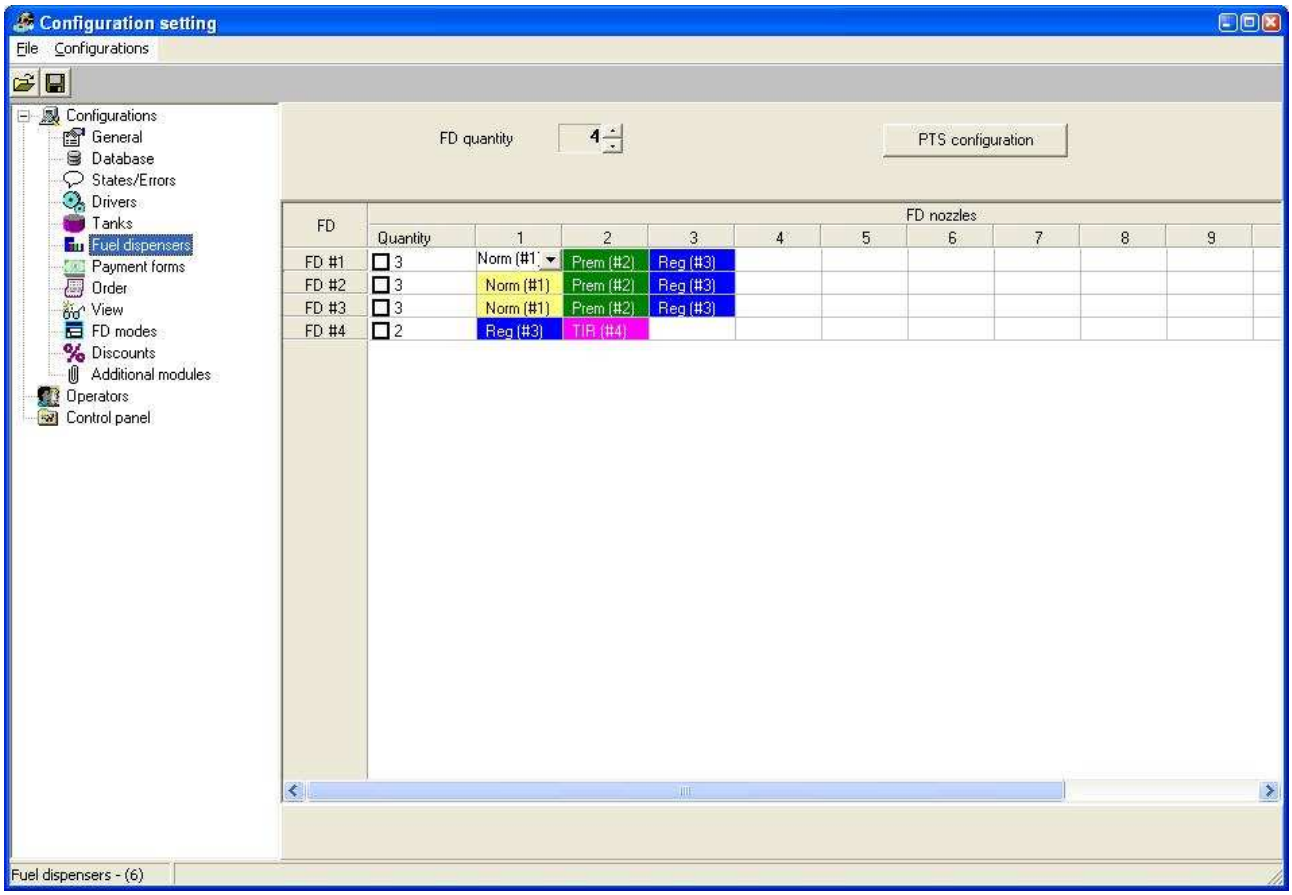
In the driver set the following configuration:

- Quantity of ATG probes equal to 4
- Protocol timeout equal to 2000 ms
- For each of the tanks use PTS controller 1, ATG addresses 1-4, calibration source – PTS controller

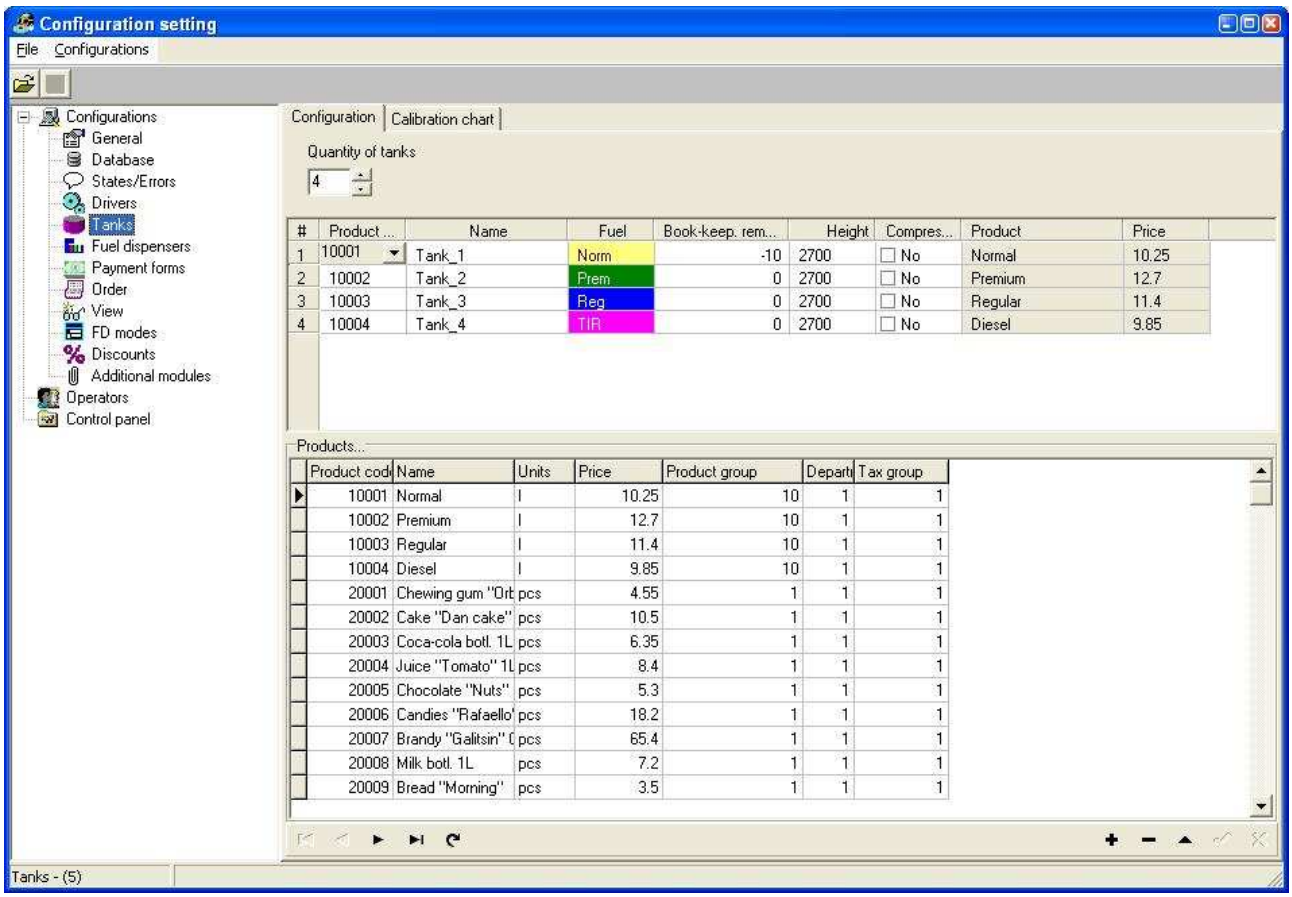




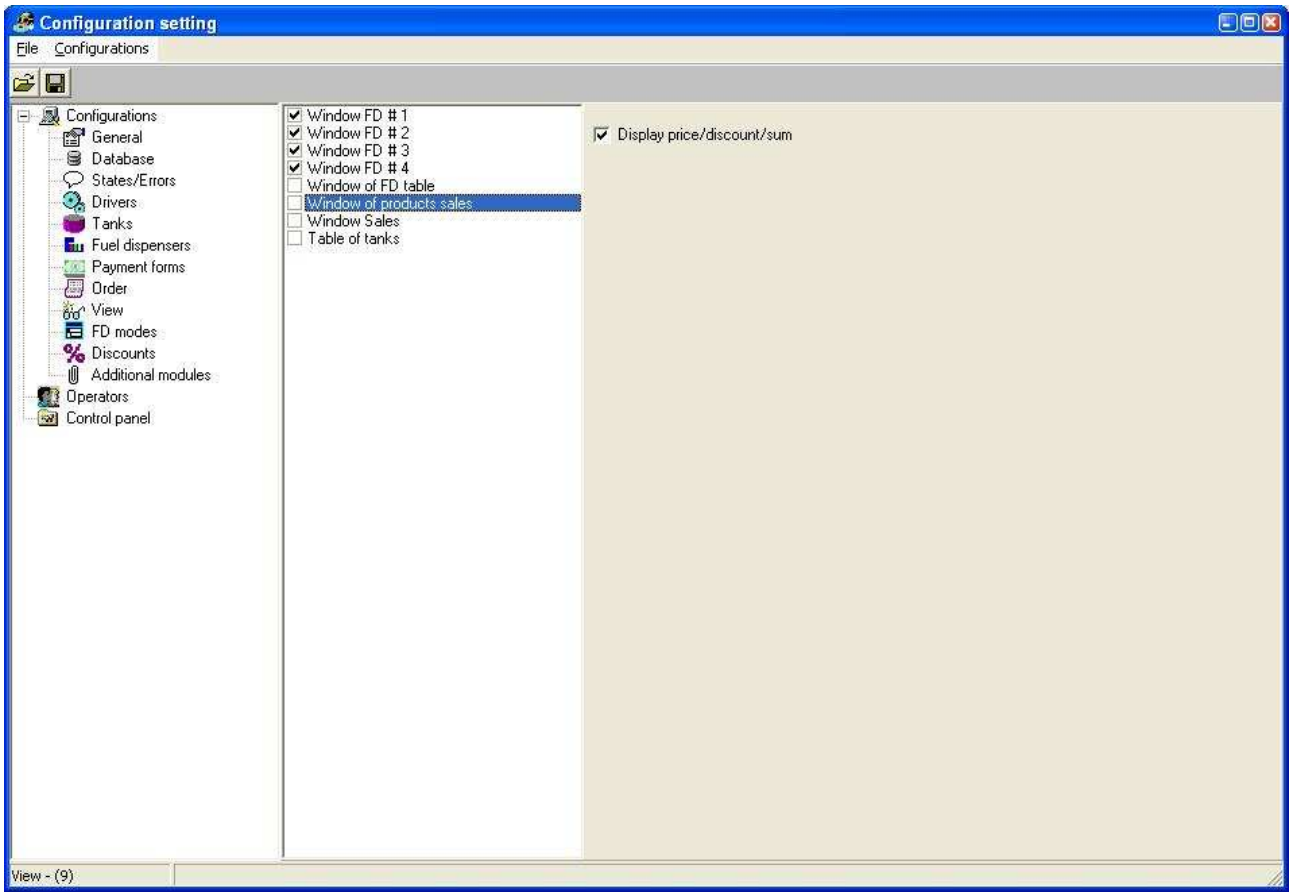
Select a tab ‘Fuel dispensers’ and set quantity of used fuel dispensers equal to 4 and save configuration:



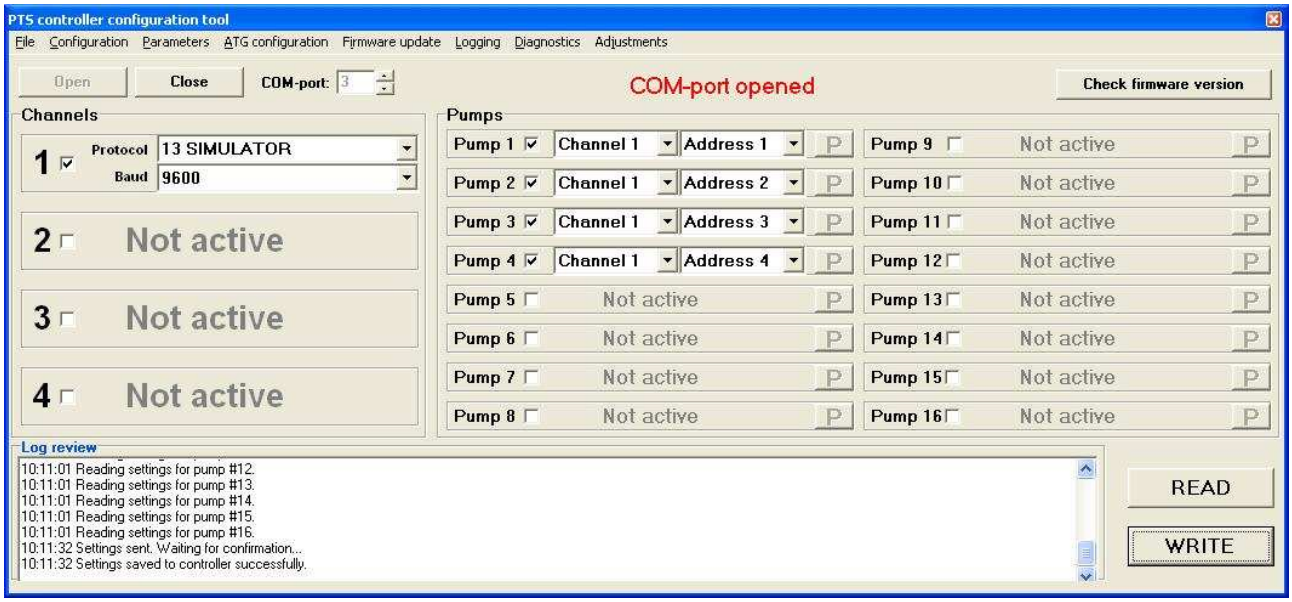
Select a tab ‘Tanks’ and set quantity of used tanks equal to 4 and save configuration:



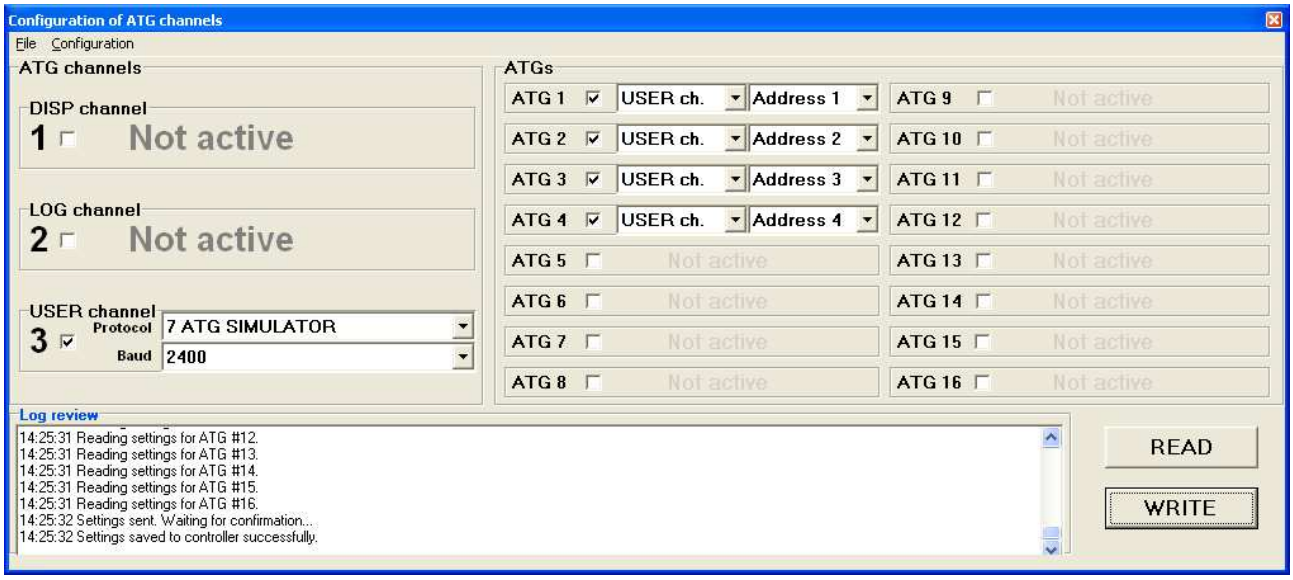
Select a tab ‘View’ and set to display only fuel dispenser icons and save configuration:



Select a tab ‘Fuel dispensers’ and press a button “PTS configuration”, where open a COM-port and set the following configuration for fuel dispensers and press WRITE button (after it click on button READ to make sure it is written correctly):

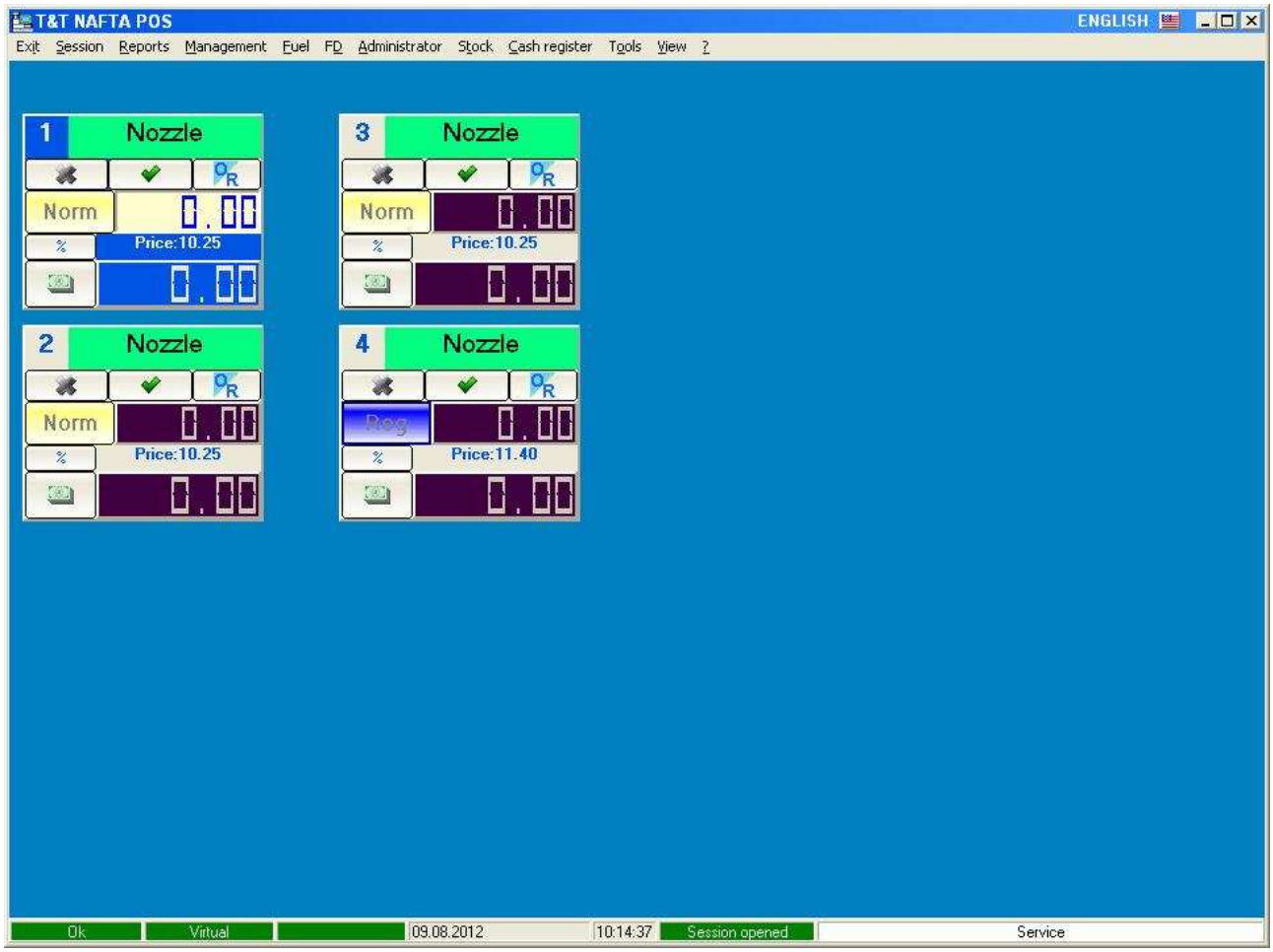


Set the following configuration for ATG systems on tab ‘ATG configuration’ and click WRITE button after this (click on button READ to make sure it is written correctly):

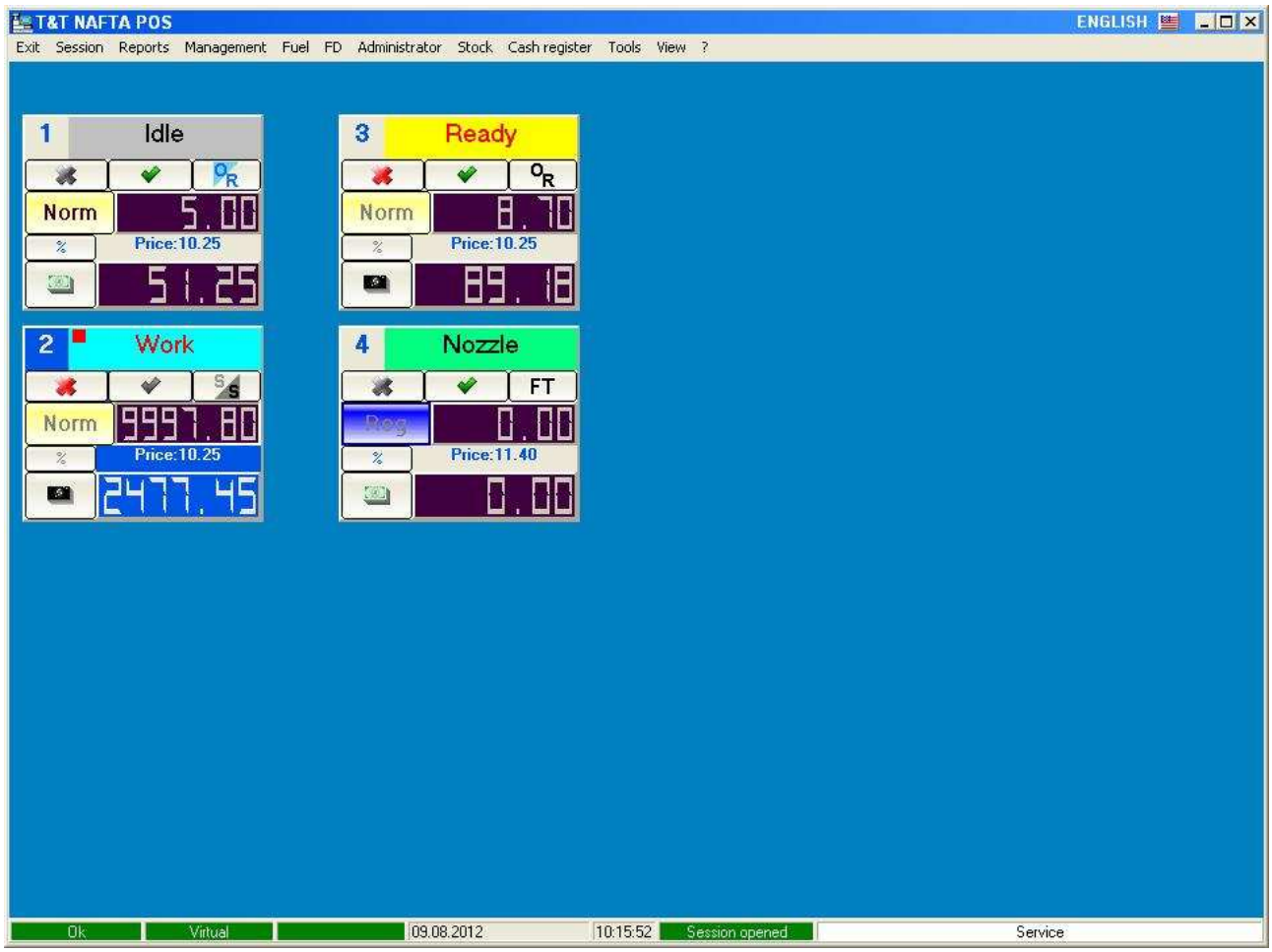


Now PTS controller is configured to work with built-in simulators of fuel dispensers and also simulators of ATG probes (see instructions in points “PTS CONTROLLER PUMP SIMULATOR” and “PTS CONTROLLER ATG PROBE SIMULATOR” of given technical guide for more information regarding the built-in simulators).

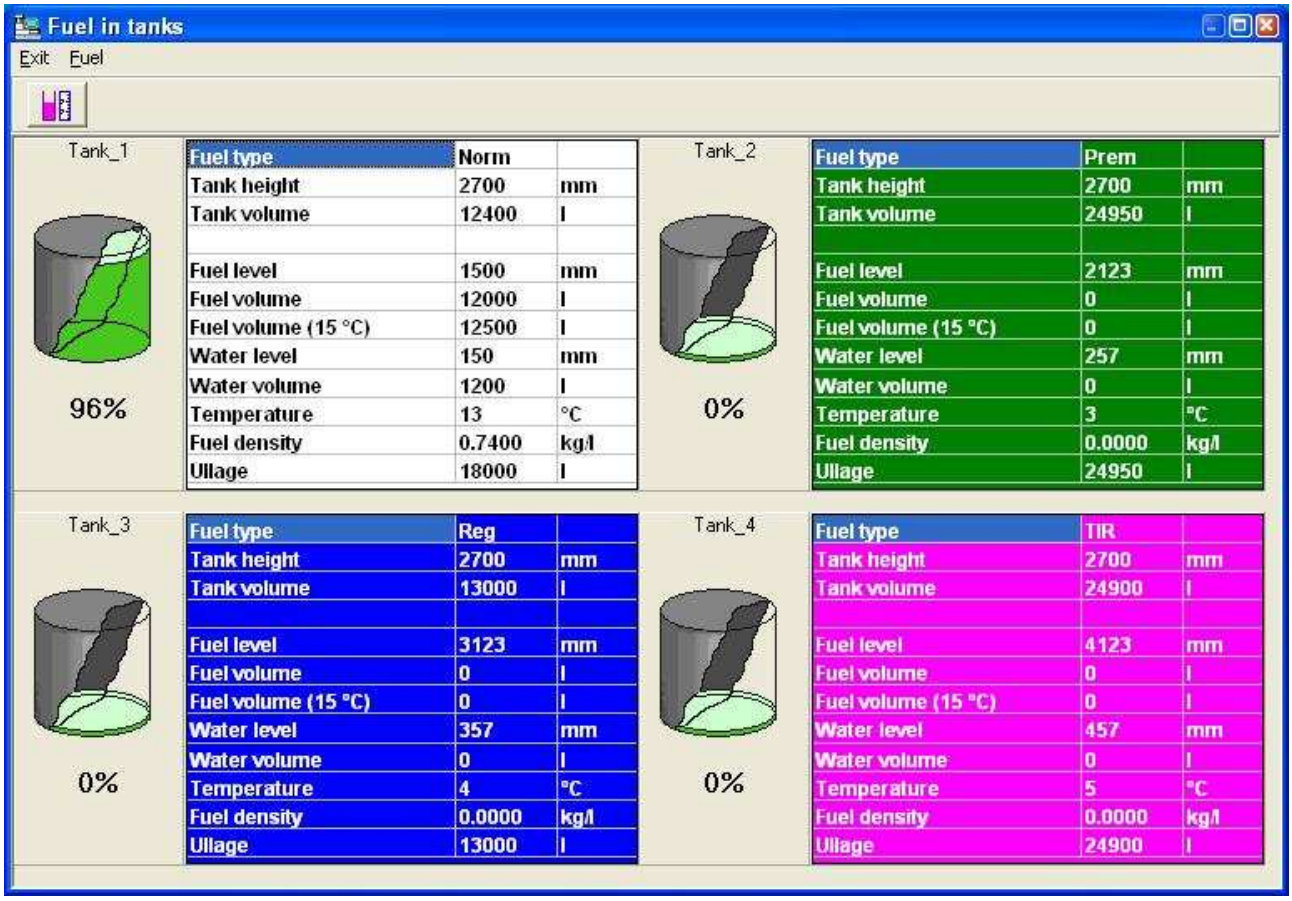
Close POSSet configuration tool of NaftaPOS and run AZSPos.exe. USB protection dongle should be inserted in the PC and Guardant drivers should be installed on this PC (read more about USB protection dongle Guardant in section “USB SOFTWARE PROTECTION DONGLE GUARDANT” on page 15 of this technical guide). Start/continue a session. You will see 4 fuel dispensers icons, each having nozzle 1 taken up:



And now it is possible to make dispensing through these dispensers:

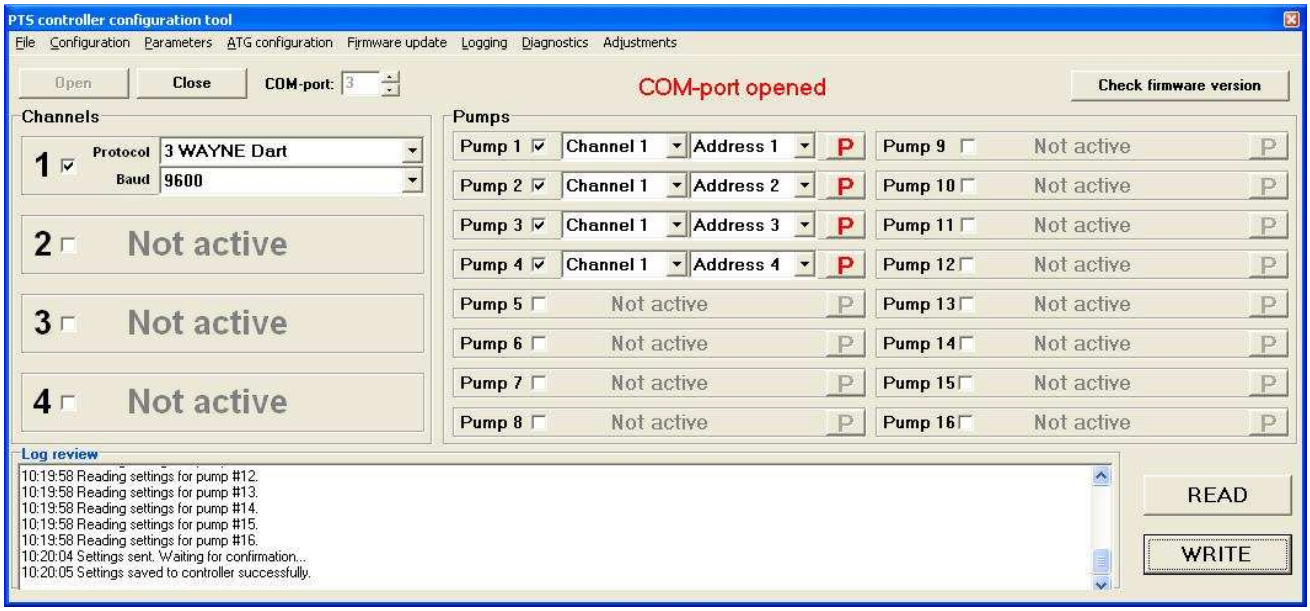


To see tanks – select an item from main menu ‘Fuel’ → ‘Window ‘Fuel in tanks’’:

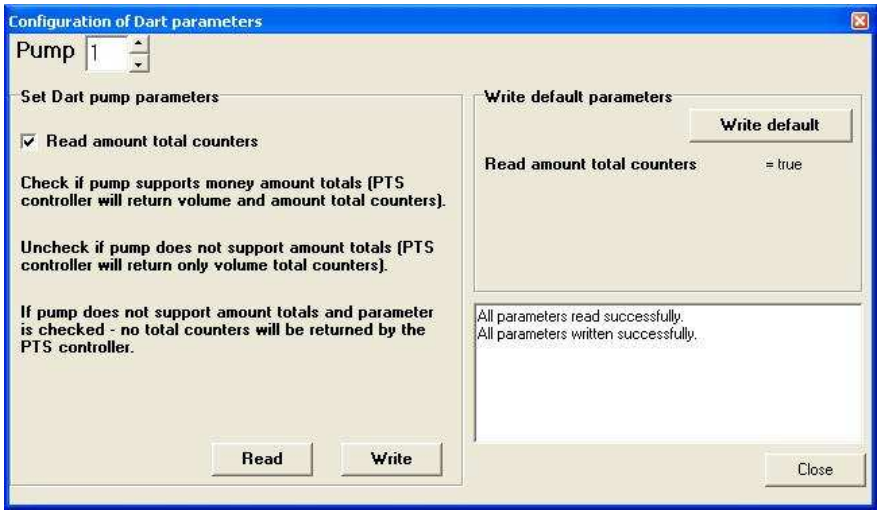


Step 5. Configuration of NaftaPOS software and PTS controller to use software simulators of fuel dispensers and ATG probes

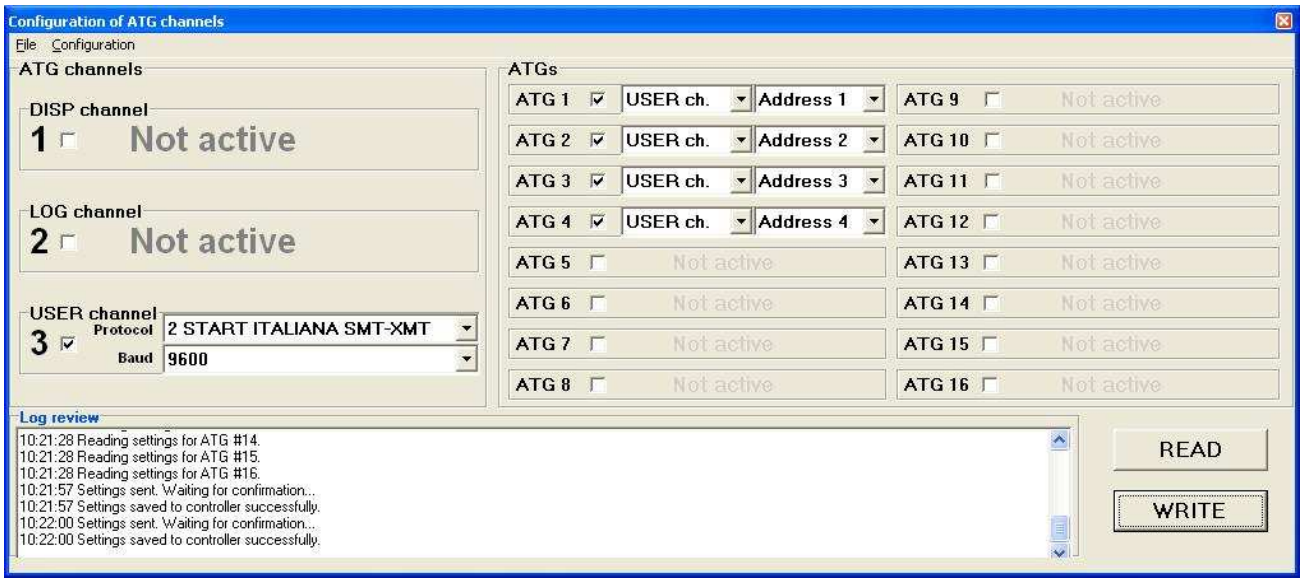
In order to use fuel dispensers software simulators and ATG probes software simulator it is necessary to reconfigure PTS controller as follows (exit NaftaPOS software first):



For Dart protocol for Wayne simulator it is necessary to set parameters as follows for each enabled pump (pumps 1-4) (read amount total counters):

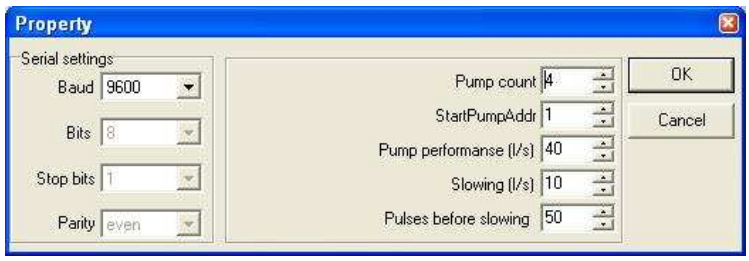


Set configuration for ATGs USER channel:

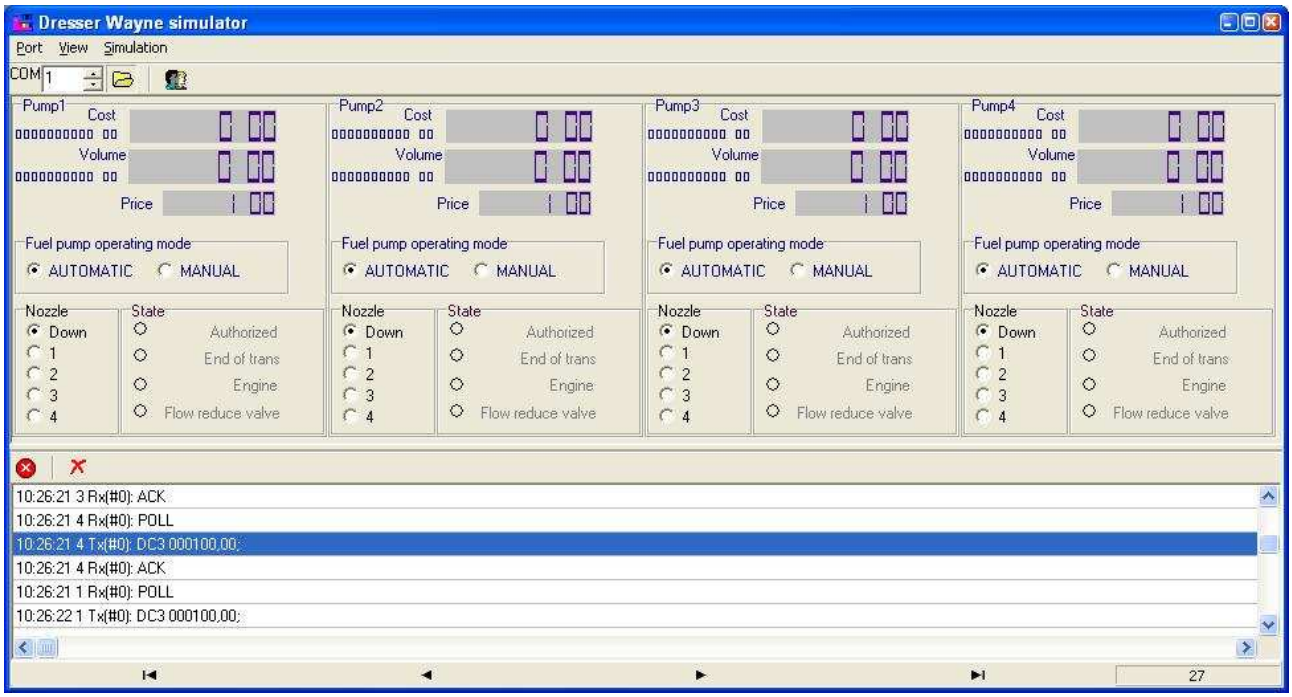


Set Wayne Dart communication protocol and 9600 baud rate for pump channel 1 and Start Italiana protocol and 9600 baud rate for USER channel.

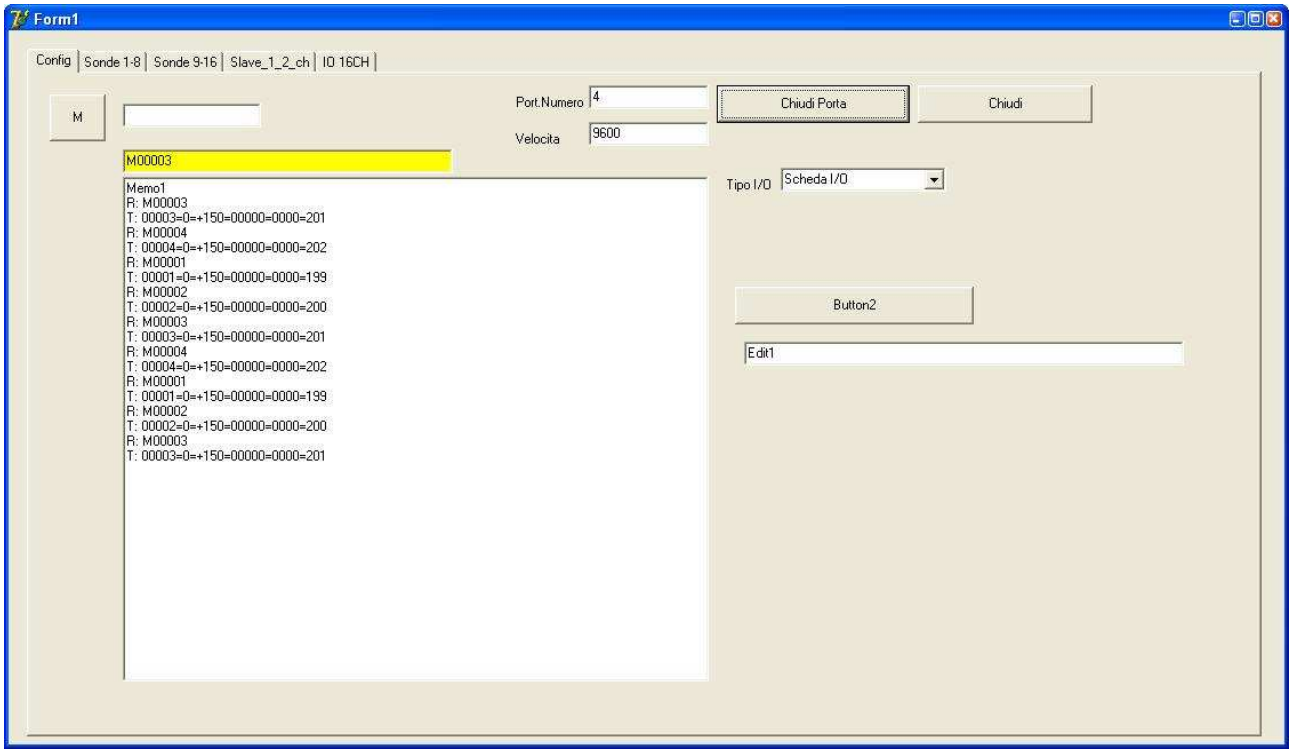
Launch Wayne Dart software simulator. USB protection dongle should be inserted in the PC and Guardant drivers should be installed on this PC (read more about USB protection dongle Guardant in section “USB SOFTWARE PROTECTION DONGLE GUARDANT” on page 15 of this technical guide). Set its adjustment in the simulator as follows:



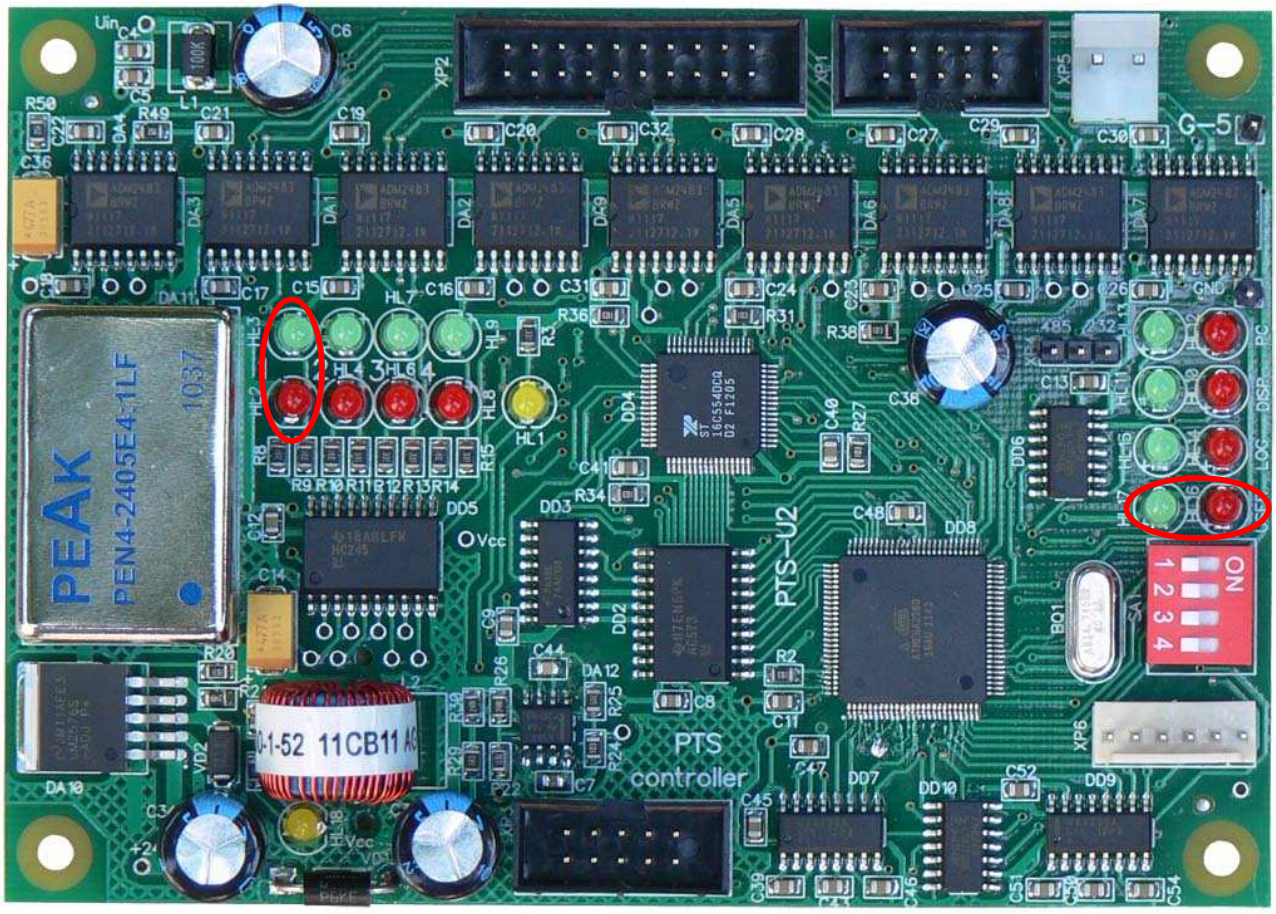
Open a COM-port in the simulator:



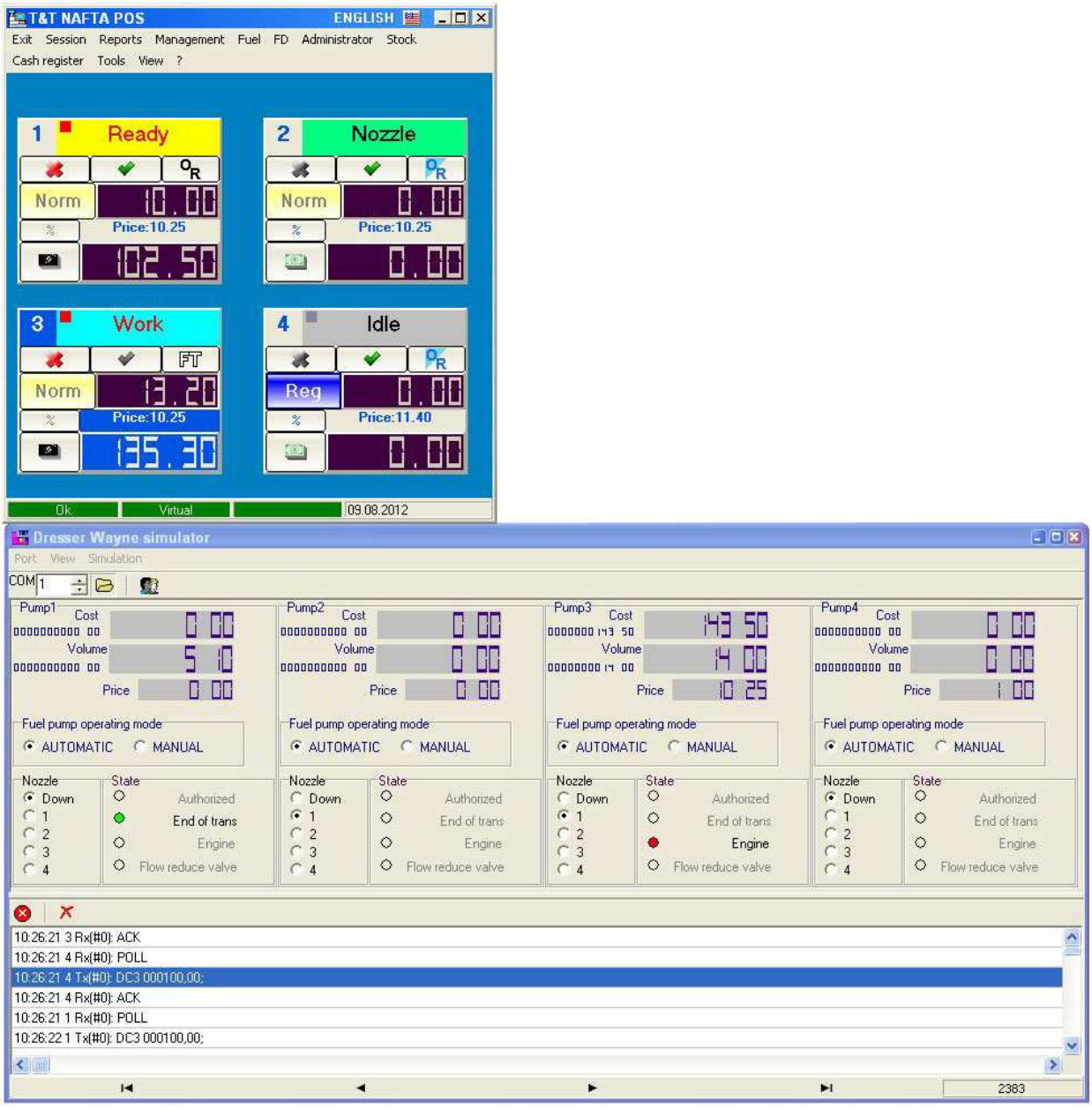
Launch Start Italiana ATG probes simulator and open a COM-port (number corresponds to COM-port, where USER channel is connected):



Now when you look at the PTS controller board – you should see green (transmit) and red (receive) LEDs blinking on pump channel 1 and also on USER channel (or on any of these channels, which is connected to correspondent COM-port and where the software simulator is launched).

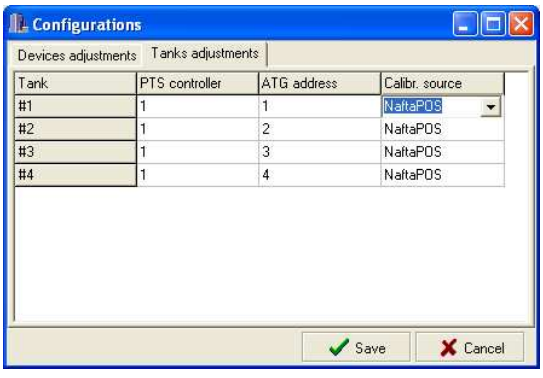


Run AZSPos.exe. Start/continue a session. You will see 4 fuel dispensers icons, using which you can provide control over fuel dispensers in Wayne Dart simulator:

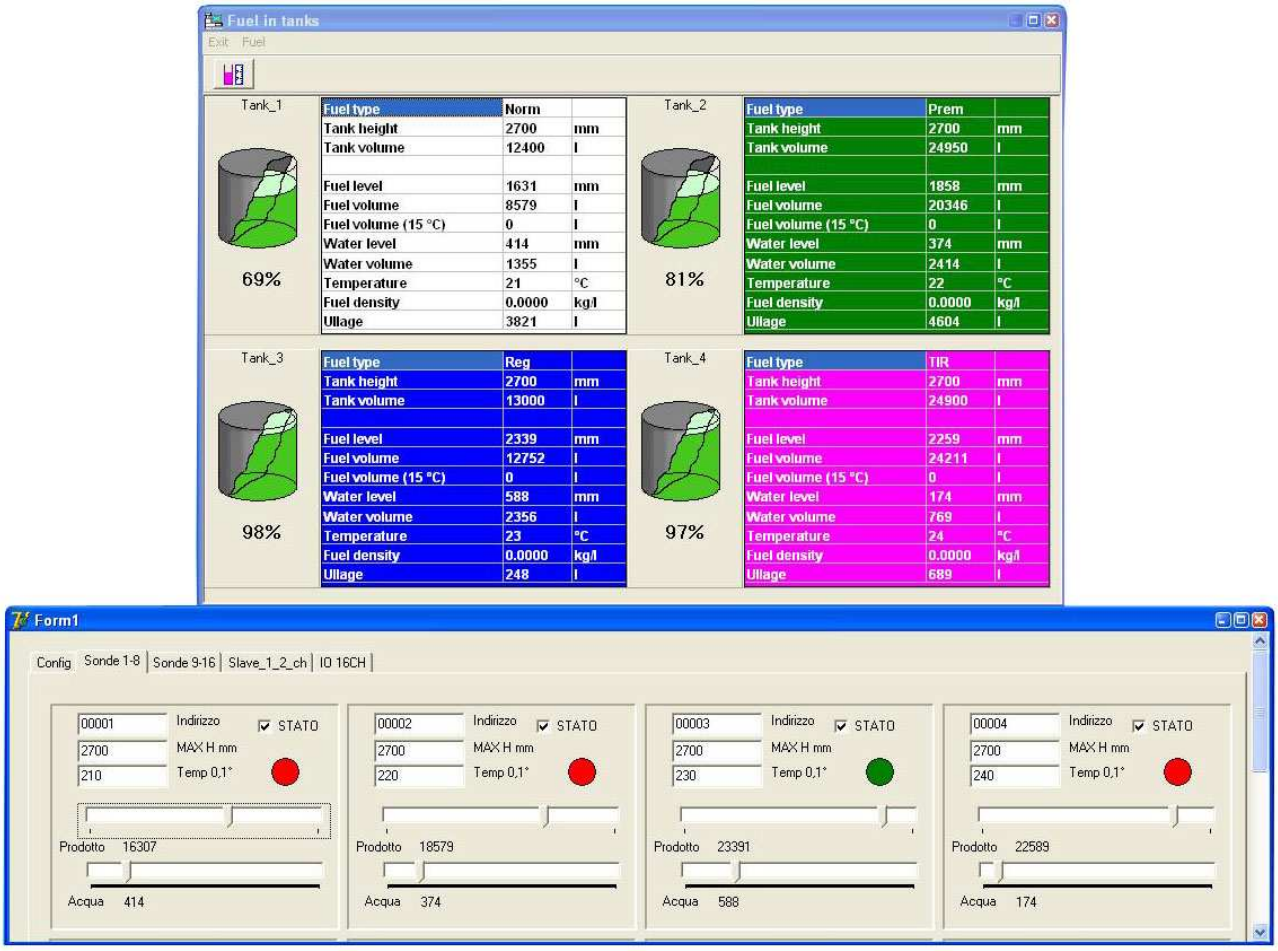


To enable dispensing from NaftaPOS a dispenser should be in Automatic operating mode and corresponding nozzle should be taken up.

Fuel levels in tanks are displayed as they are in the software simulator. Notice that to the software simulator gives out only measurements of fuel level, water level and temperature. That is why to obtain the volume in tank the calibration chart of the correspondent tank is to be set in NaftaPOS and also in the tanks “PTS ATG driver” (in POSSet on Drivers tab) NaftaPOS should be selected as a calibration source for each of the tanks:



Values of Start Italiana ATG probe software simulator are displayed in NaftaPOS:

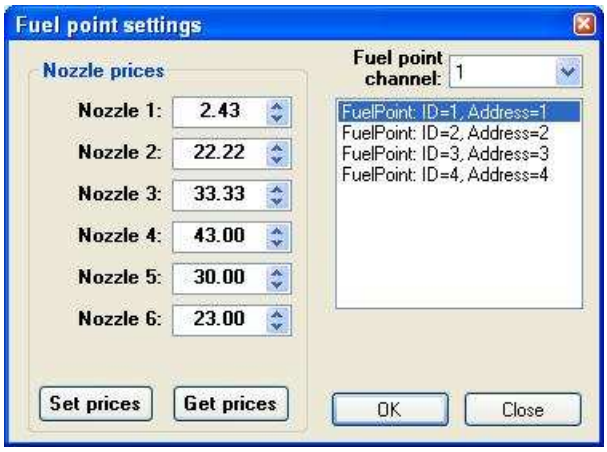


Step 6. Configuration of NET application to use software simulators of fuel dispensers and ATG probes

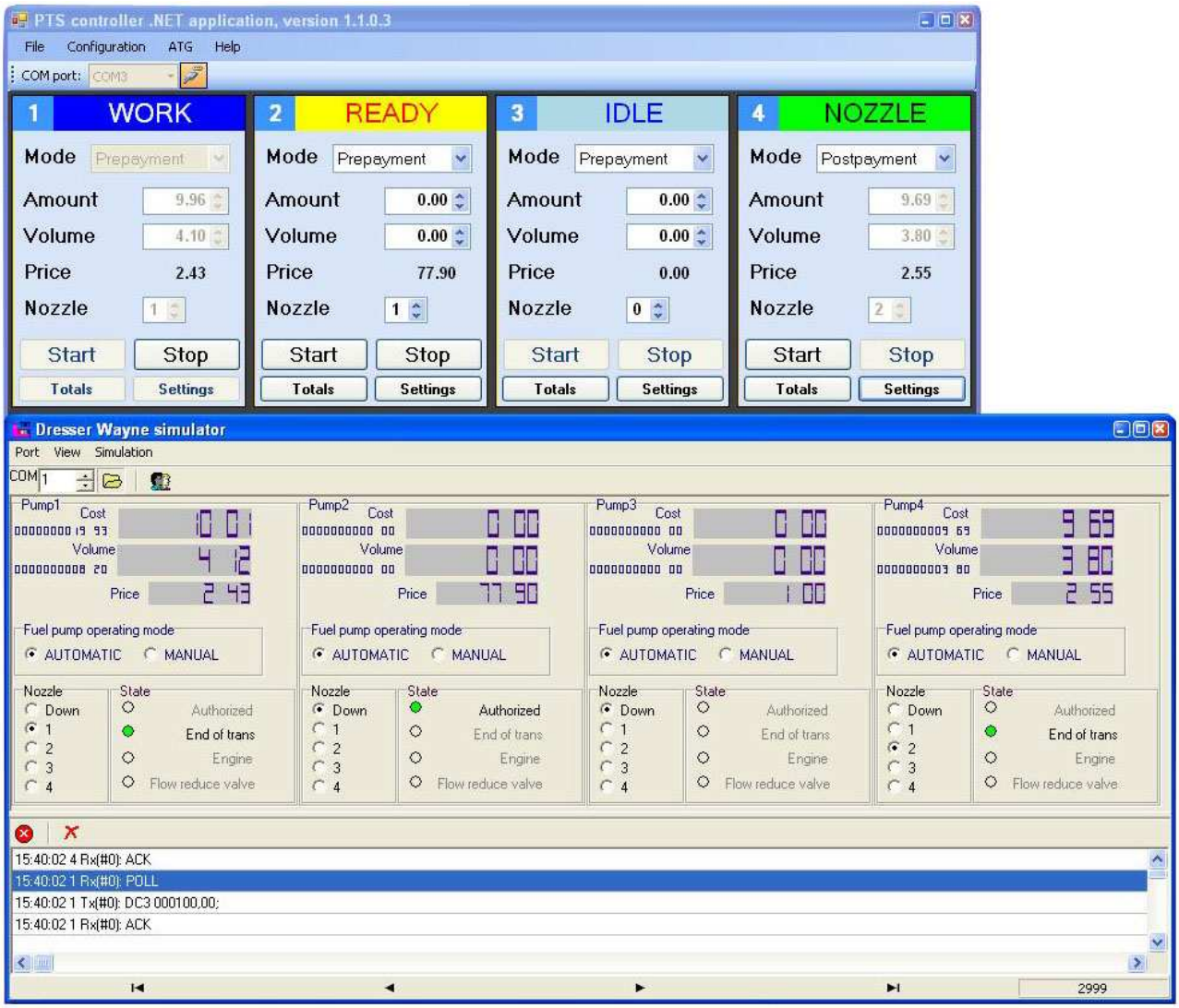
Read instructions in point “PTS CONTROLLER API: PTS CONTROLLER .NET APPLICATION” of given technical guide for more information regarding the PTS .NET application.

Leave PTS controller configuration as it was set previously and run PtsApplication.exe located in PTS_SDK\API TOOLS\PTS .NET application (release 1.1.0.3)\PTS\bin\Debug\ folder.

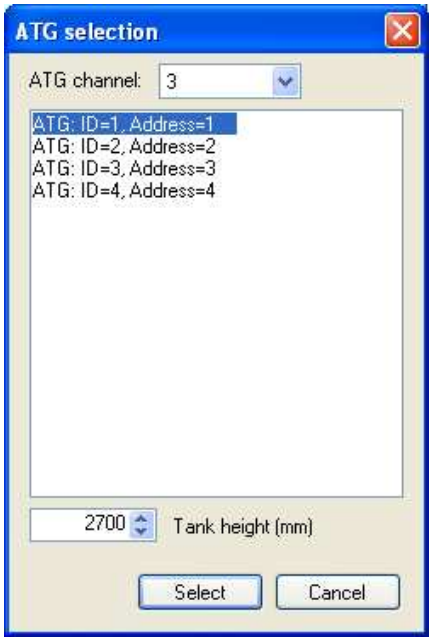
Control over fuel dispensers in made using fuel dispenser icons, to which you can appoint any pump address from PTS controller. Appointment of the pump address to be indicated is made in a menu called by clicking a button “Settings”:



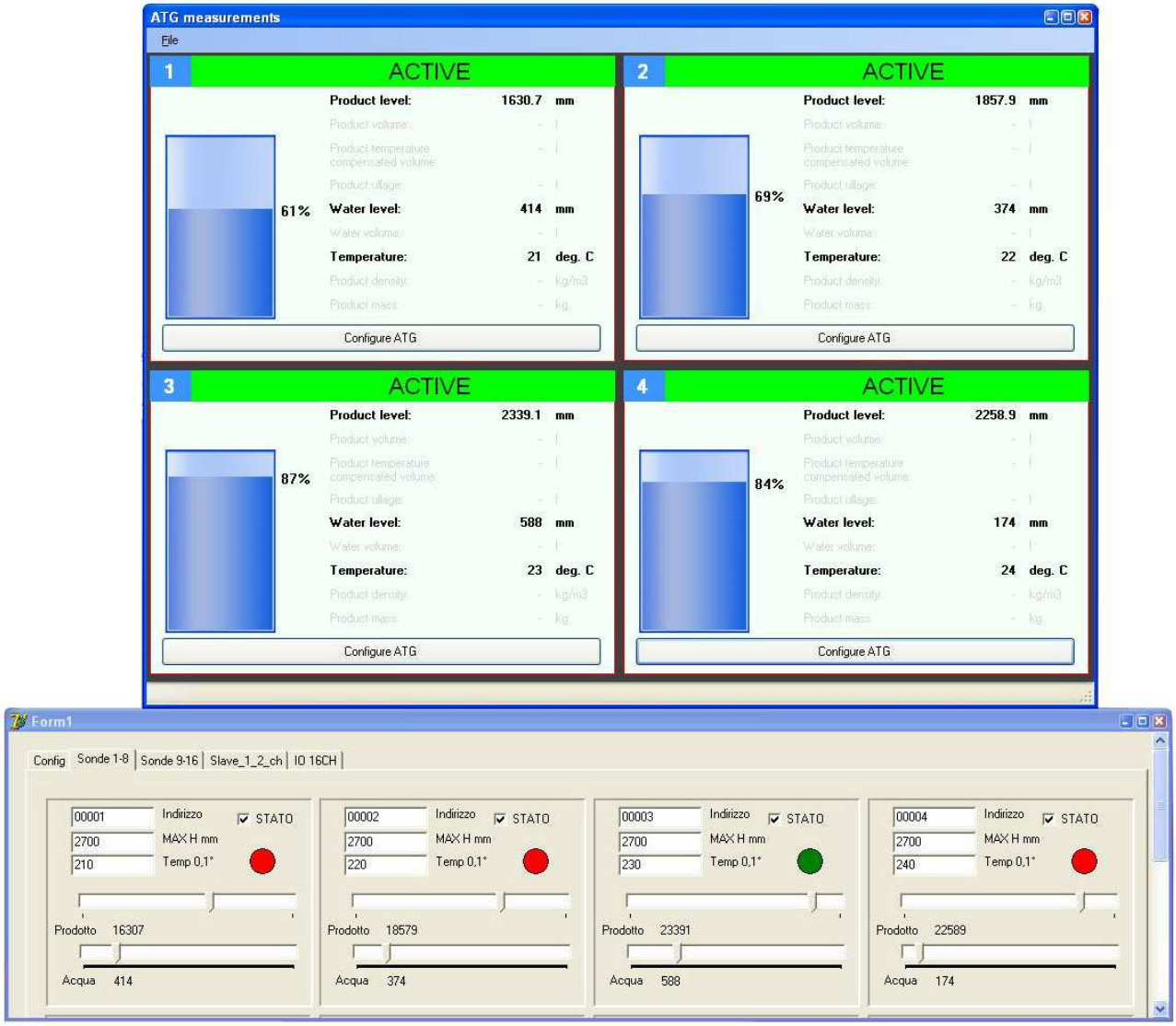
Control over fuel dispensers:



Indication of ATG probes in made in a form, called from the main menu “ATG” → “ATG measurements”. Appointment of the ATG probe address to be indicated is made in a menu called by clicking a button “Configure ATG”, also there a tank height is entered:

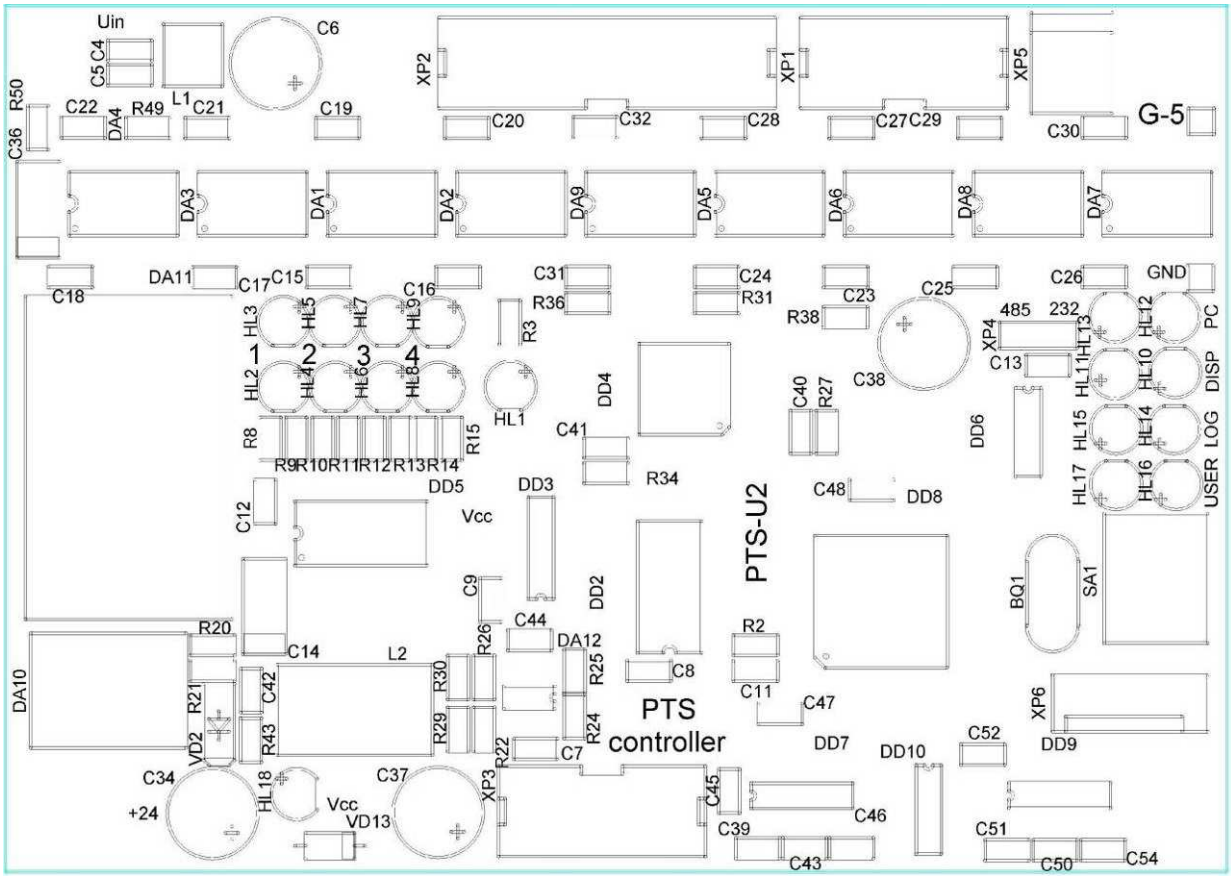


Indication of ATG probes measurements:

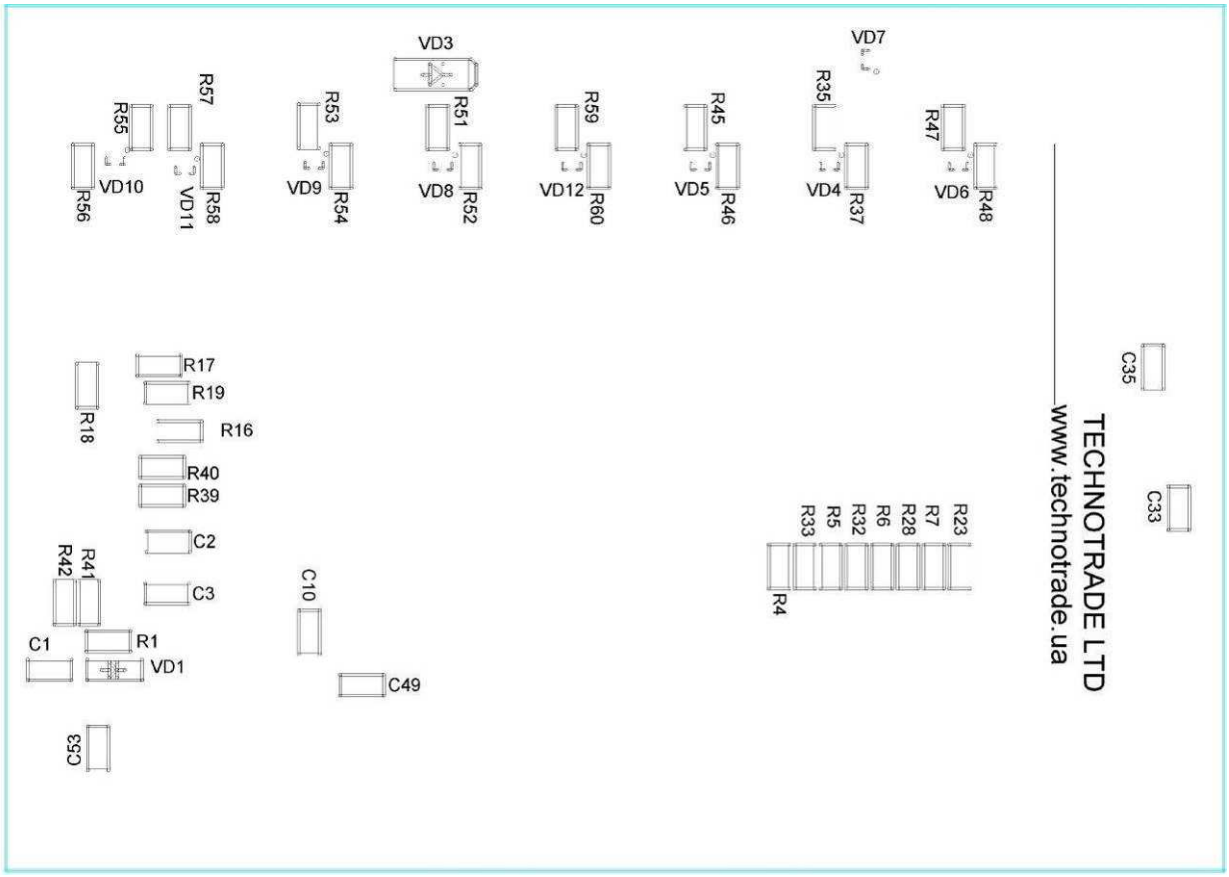


PTS CONTROLLER PCB BOARD

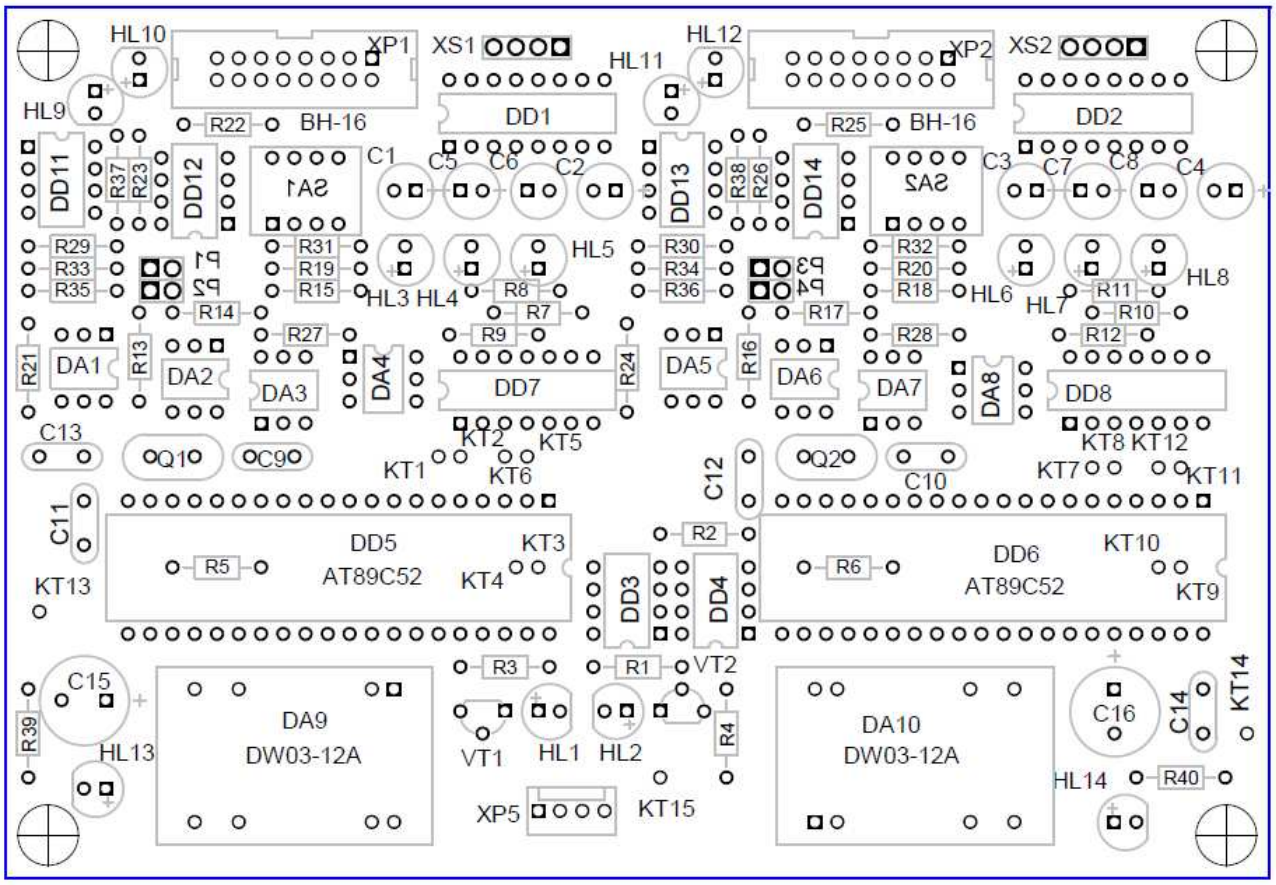
PCB board top view



PCB board bottom view

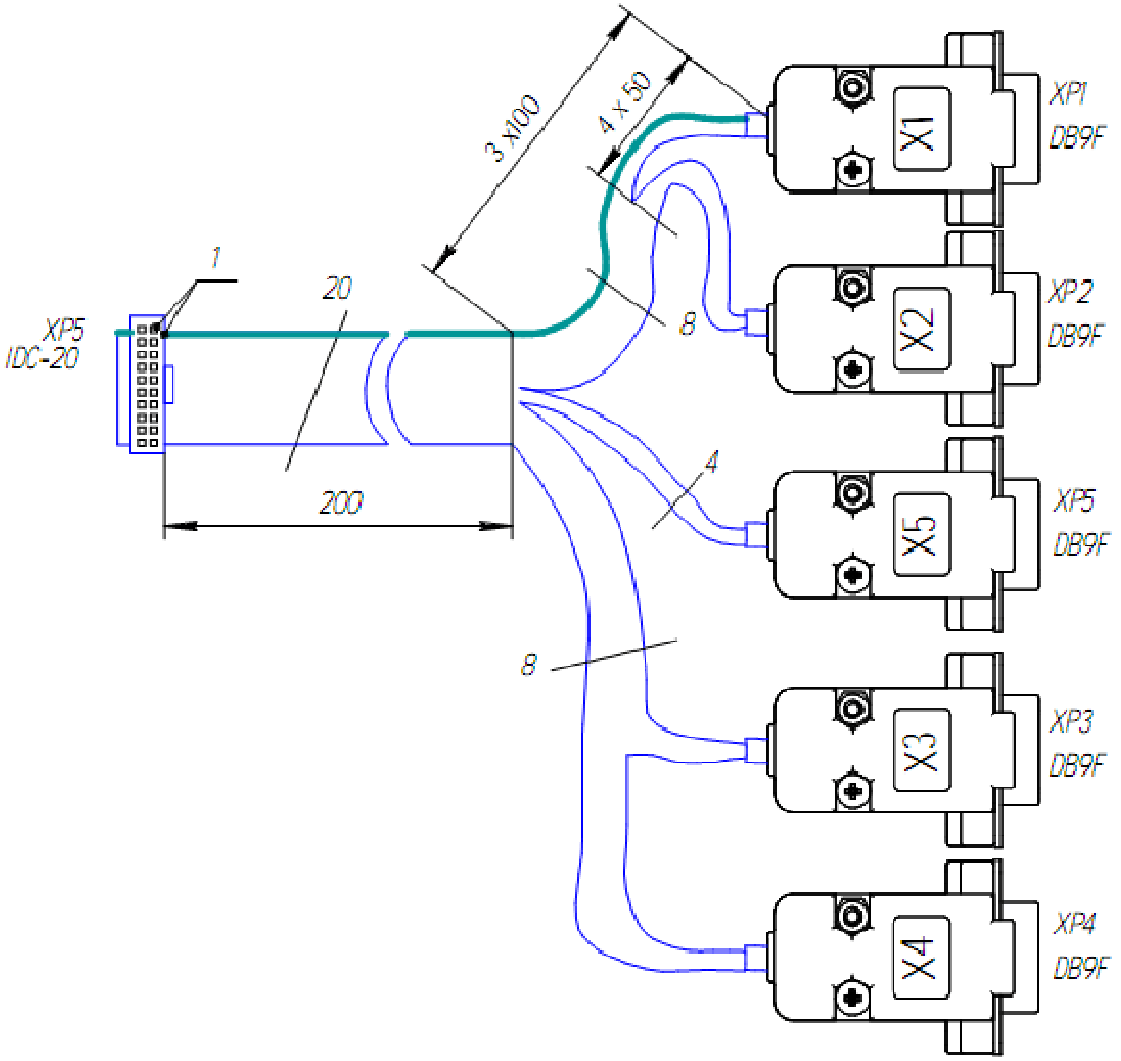


RS-232/RS-485 INTERFACE CONVERTER PCB BOARD



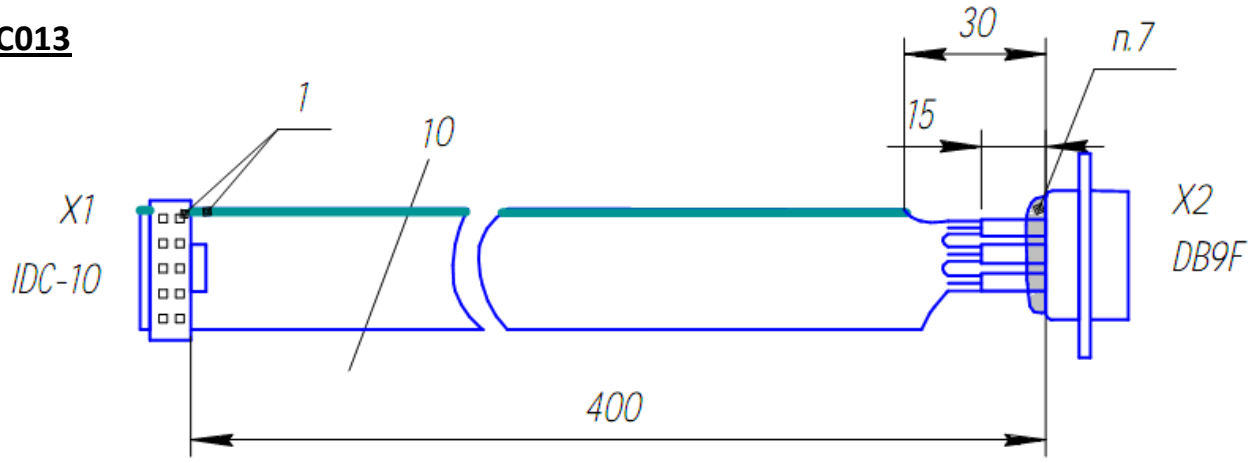
PTS SDK CABLINGS

CABLE C012-1

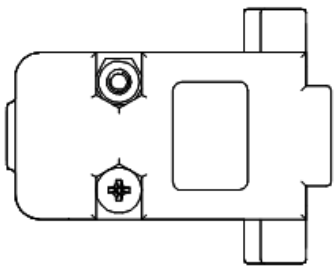


XP5	XP1
1	1
3	3
5	5
7	7
	XP2
2	1
4	3
6	5
8	7
	XP3
13	1
15	3
17	5
19	7
	XP4
14	1
16	3
18	5
20	7
	XP5
9	1
10	
11	3
12	

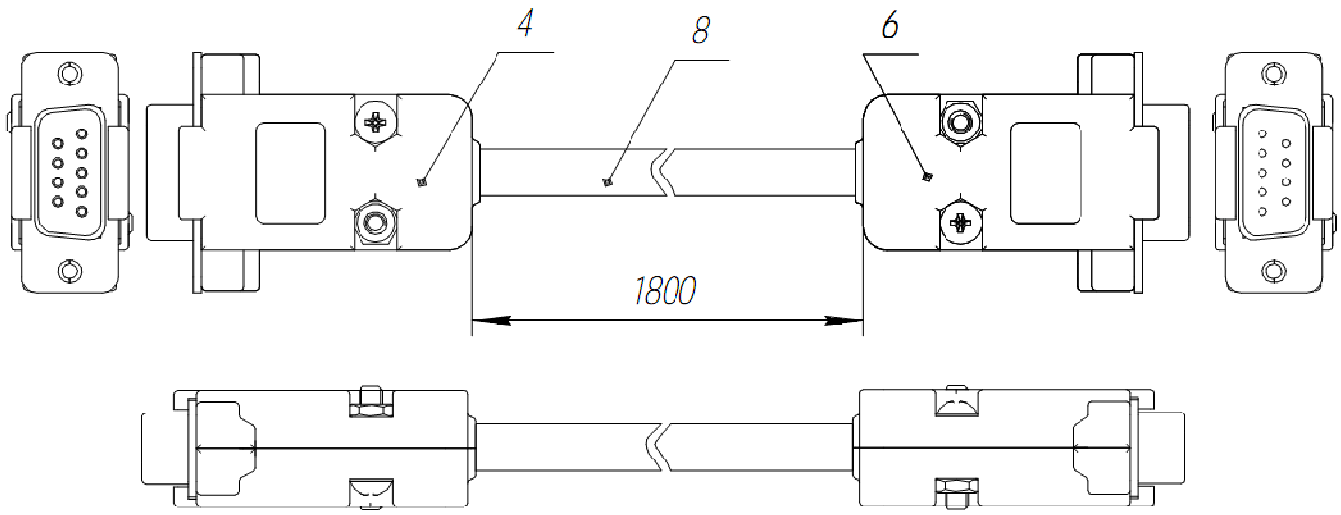
CABLE C013



XP1	XP2
3, 4	5
5, 6	2
9, 10	3
1, 2	-
7, 8	-

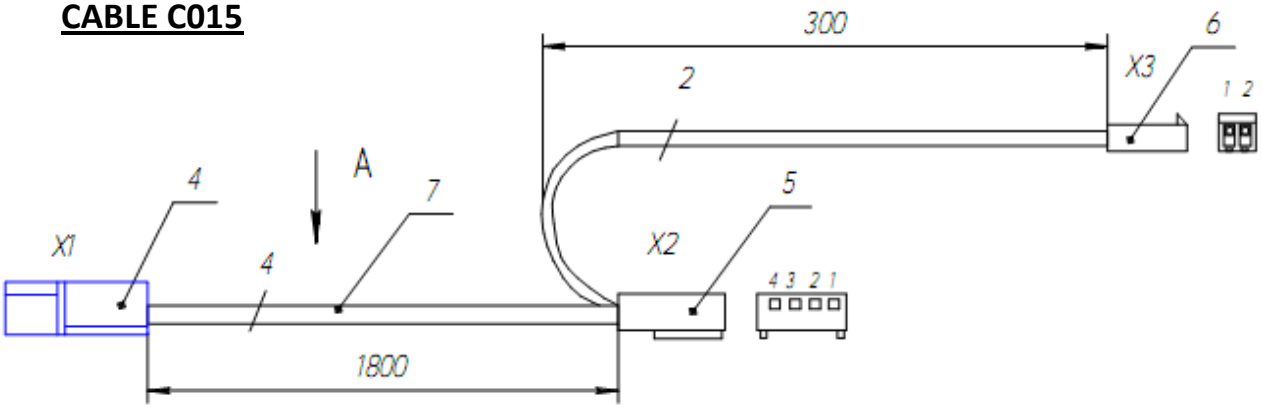


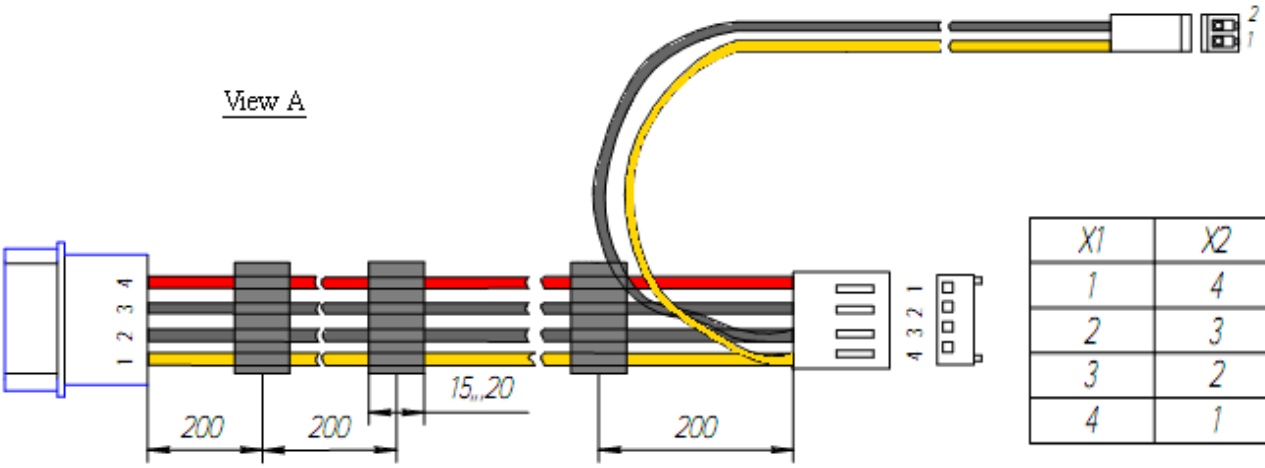
CABLE C014



X1 - DB-9F	X2 - DB-9M
2	2
3	3
5	5
7	7

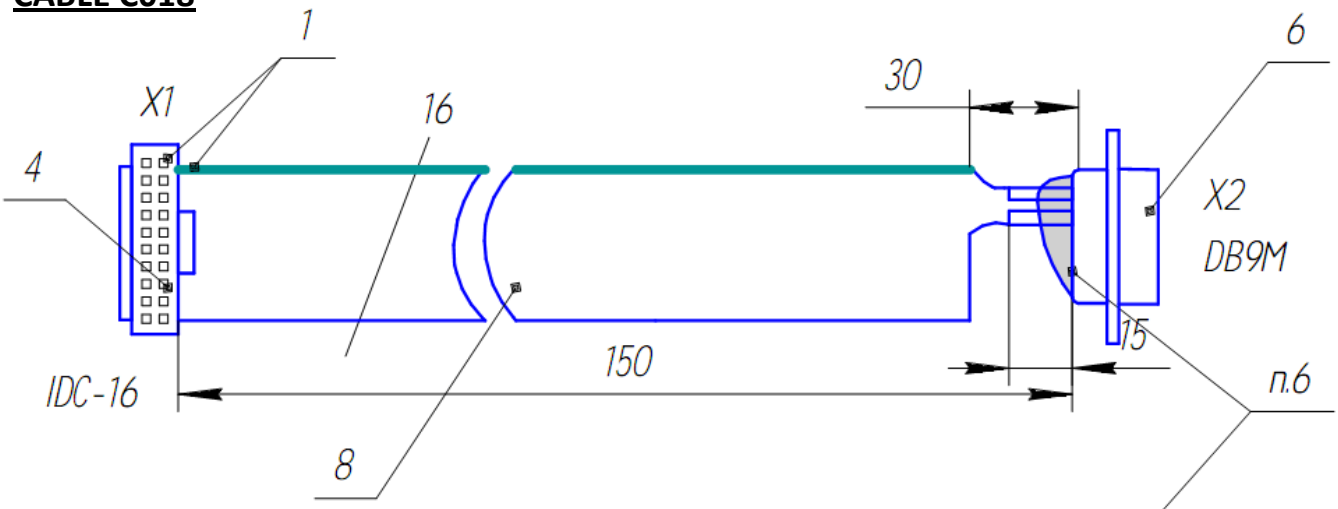
CABLE C015



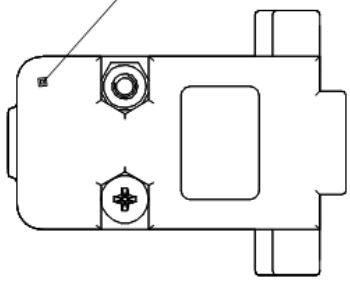


X1	X2	X3
1	4	1
2	3	2
3	2	
4	1	

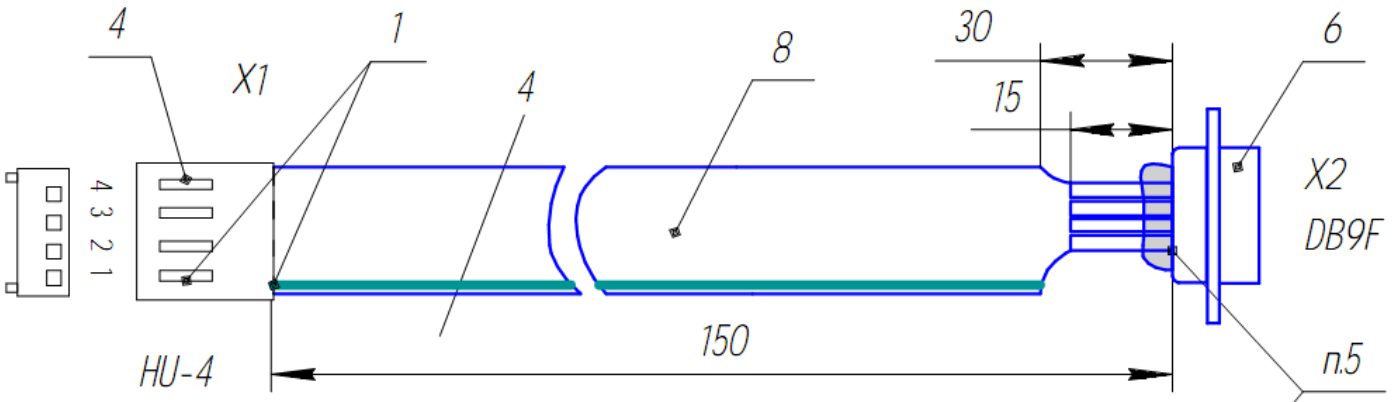
CABLE C018



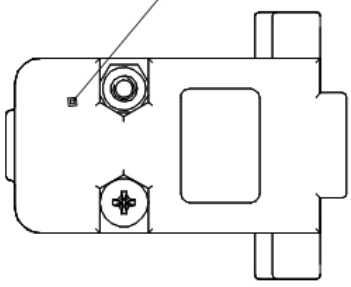
XP1	XP2
3	1
2	3



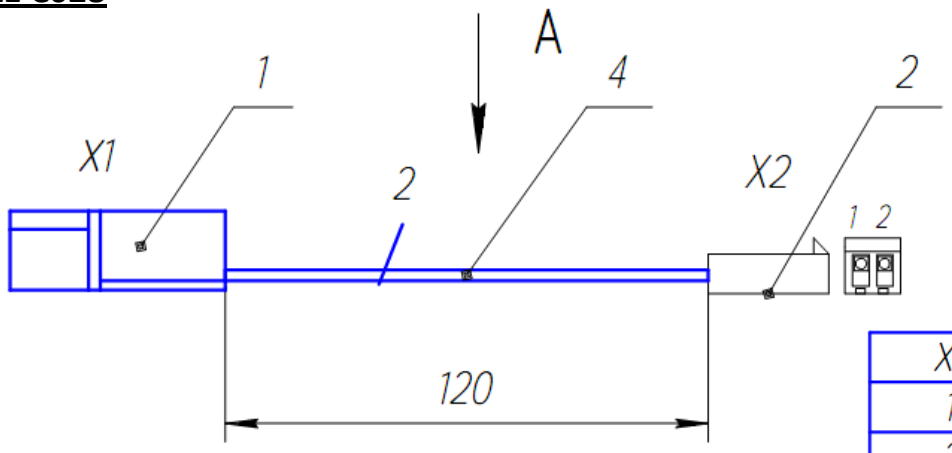
CABLE C020



XP1	XP2
1	2
2	3
3	5
4	7

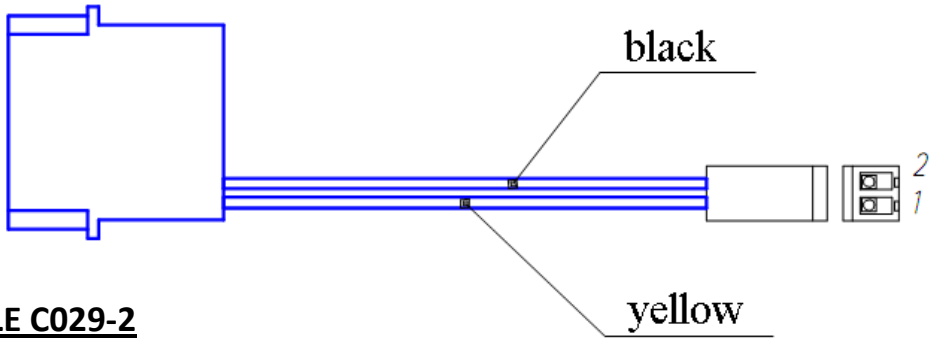


CABLE C028

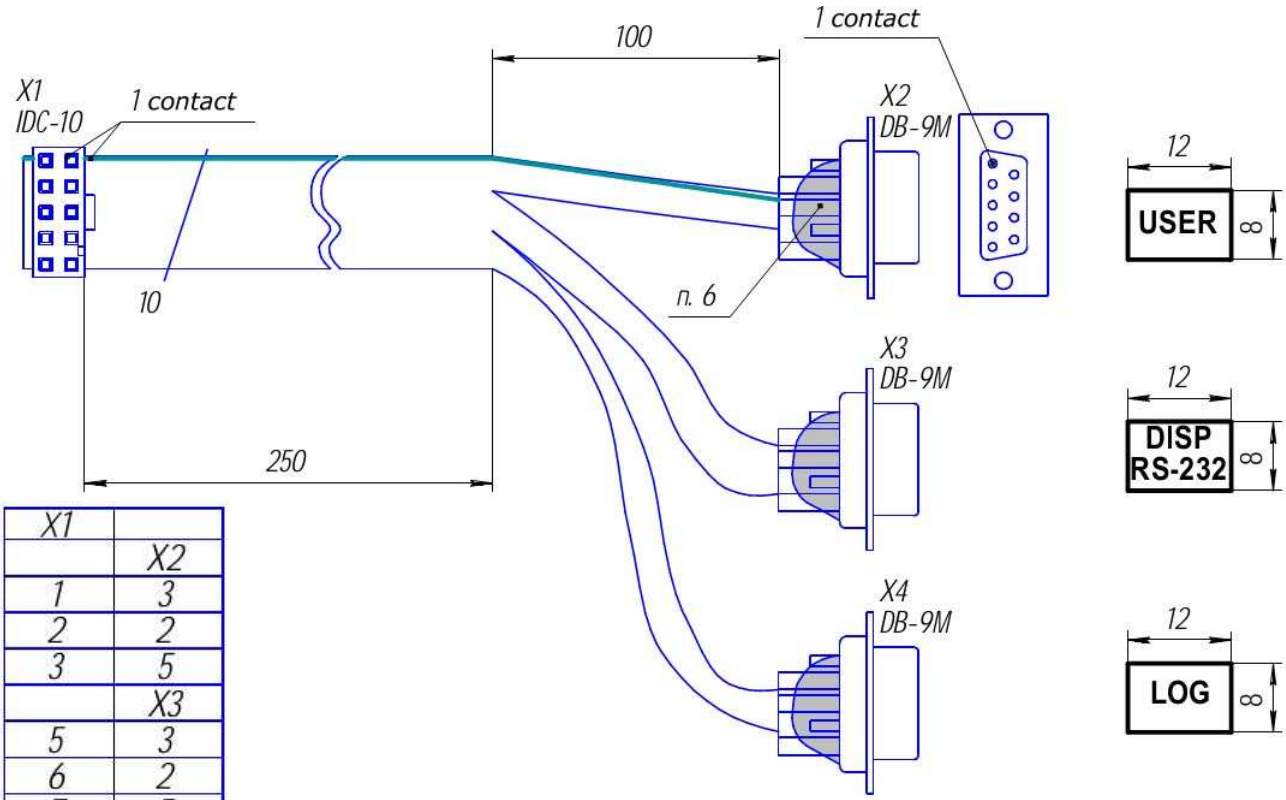


X1	X2
1	1
2	2
3	
4	

View A

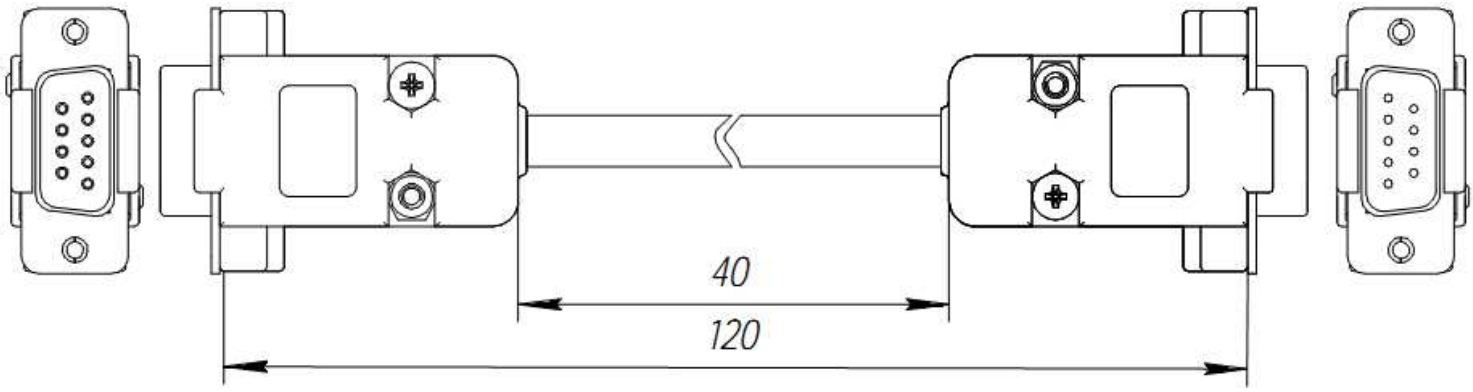


CABLE C029-2



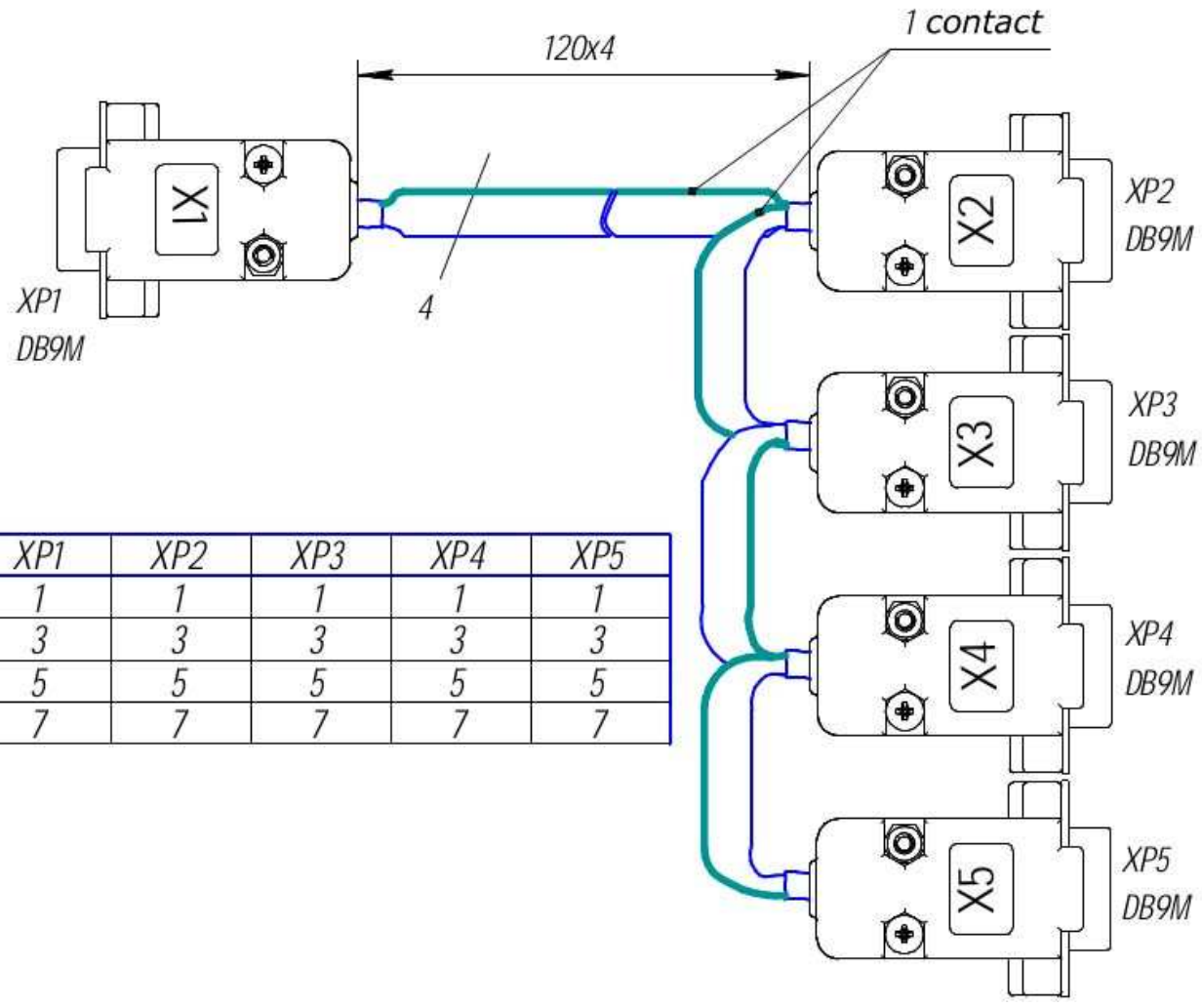
X1	
	X2
1	3
2	2
3	5
	X3
5	3
6	2
7	5
	X4
9	3
10	2
8	5

CABLE C033



X1 - DB-9F	X2 - DB-9F
2	3
3	2
5	5

CABLE C055



XP1	XP2	XP3	XP4	XP5
1	1	1	1	1
3	3	3	3	3
5	5	5	5	5
7	7	7	7	7