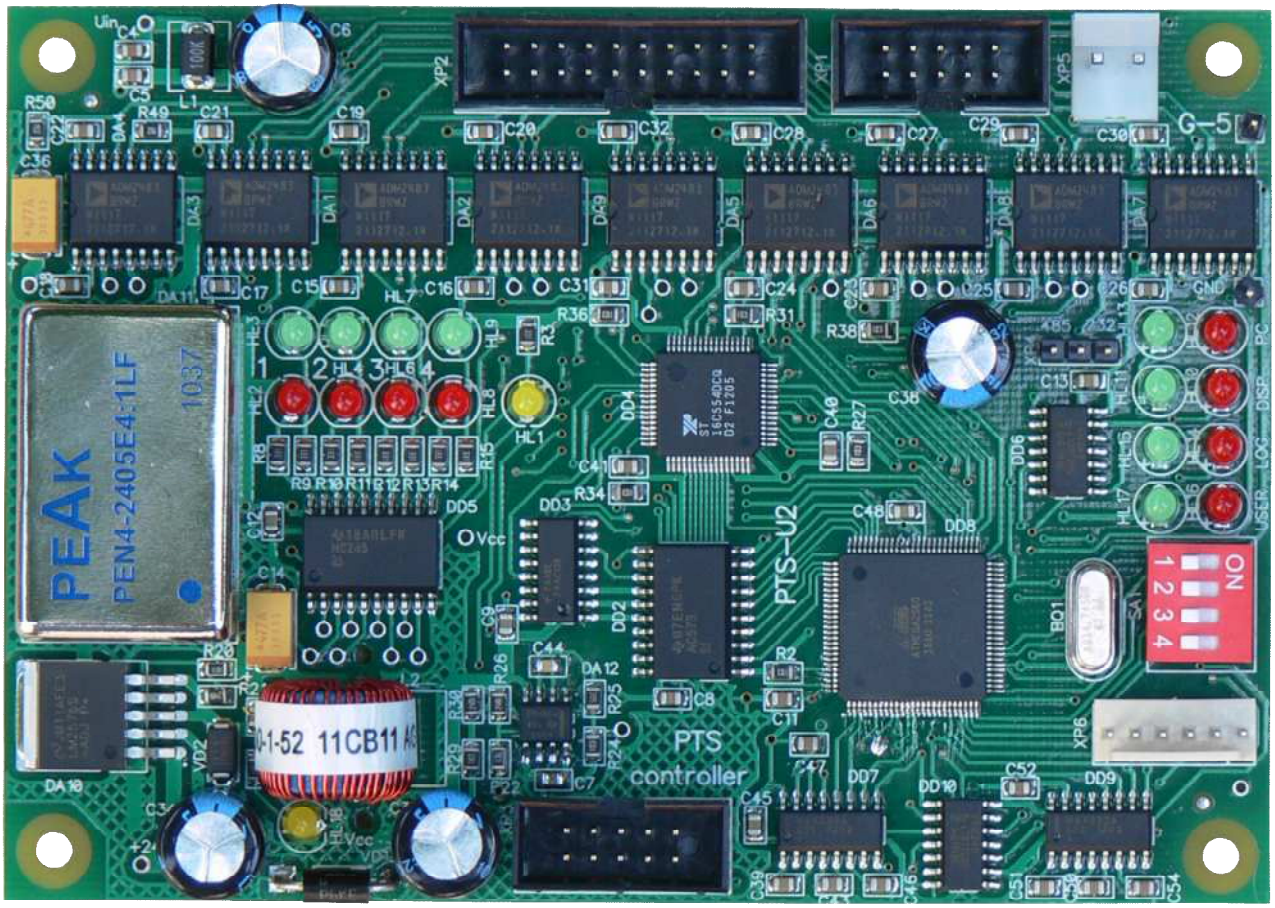
PTS controller

over fuel dispensers and ATG systems for petrol stations



TECHNICAL GUIDE

(PTS controller PCB board modification: PTS-U2)

Review date: 12 Aug, 2012

“TECHNOTRADE LTD”

CONTENT

PURPOSE OF THE DOCUMENT

This Technical Guide is intended for studying of PTS controller over fuel dispensers and ATG systems for petrol stations. It contains basic information regarding its board interfaces and connectors, configuration and adjustment, firmware update, log capturing, connection to fuel dispensers, cablings. Information regarding connection to specific fuel dispensers and correspondent configuration of PTS controller can be received upon request to TECHNOTRADE LTD company.

Due to a reason that PTS controller firmware is constantly being developed in direction of improvements 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 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.

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.

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)

SUPPORTED FUEL DISPENSERS

FUEL DISPENSER BRAND	PROTOCOL NAME	BAUD RATE
Gilbarco *	GILBARCO Two-Wire	5787
Tokheim *	TOKHEIM Controller-Dispenser Communication protocol	9600
Wayne Dresser	WAYNE Dart	9600
Wayne Dresser *	Wayne US Current Loop	9600
Nuovo Pignone	WAYNE Dart	9600
Nuovo Pignone *	Nuovo Pignone	2400
Tatsuno	TATSUNO SS-LAN	19200
Tatsuno Benč	TATSUNO Benč PDE	9600 / 19200
Tokico	TOKICO SS-LAN	19200
Adast	ADAST EasyCall	9600
PEC (Gallagher Fuel Systems)	PEC Pump Communication Protocol	1200
Petrotec *	GILBARCO Two-Wire	5787
Logitron	Marconi PumaLAN	4800
ZAP / MM Petro	MM PETRO ZAP RS-485	9600
Bennett *	BENNETT pump dispenser protocol (current loop)	4800
Bennett	BENNETT pump dispenser protocol (RS-485)	9600
EMGAZ Dragon *	Marconi PumaLAN	4800
Galileo *	PumpControl GC21	9600
Pump Control *	PumpControl GC21	9600
Agira *	PumpControl GC21	9600
Aspro *	PumpControl GC21	9600
IMW *	PumpControl GC21	9600
Kraus *	GILBARCO Australia Two-Wire	5787
Batchen *	GILBARCO Australia Two-Wire	4800
Email *	GILBARCO Australia Two-Wire	4800
Prowalco *	SPDC-1, MPDC-1	4800
EuroPump *	WAYNE Dart	9600
Meksan / Wayne SU86	WAYNE Dart	9600
Mepsan	WAYNE Dart	9600
2A	WAYNE Dart	9600
Petrolmeccanica	WAYNE Dart	9600
Baransay	GILBARCO Two-Wire	5760
Falcon LPG *	GILBARCO Two-Wire	5787
Korea EnE	EnE Dispenser POS protocol	4800/9600
LG EnE	EnE Dispenser POS protocol	4800/9600
SOMO Petro	POS protocol	4800/9600
HongYang	GILBARCO Two-wire	4800/5787
Sanki	Sanki communication protocol	9600
Blue Sky	Blue Sky	4800
Real-Tech	Blue Sky	4800

Sea Bird	**Blue Sky**	4800
GREENFIELD	**GILBARCO Two-wire**	4800/5787
SAFE	**SAFE Graf**	9600
Develco	**DEVELCO**	9600
Slavutich	**SLAVUTICH FD-Link**	9600
Shelf	**SHELF**	9600
UNICON-TiT	**TIT UniPump**	9600
KPG-2	**TIT UniGaz**	9600
KievNIIGaz	**TIT UniGaz**	9600

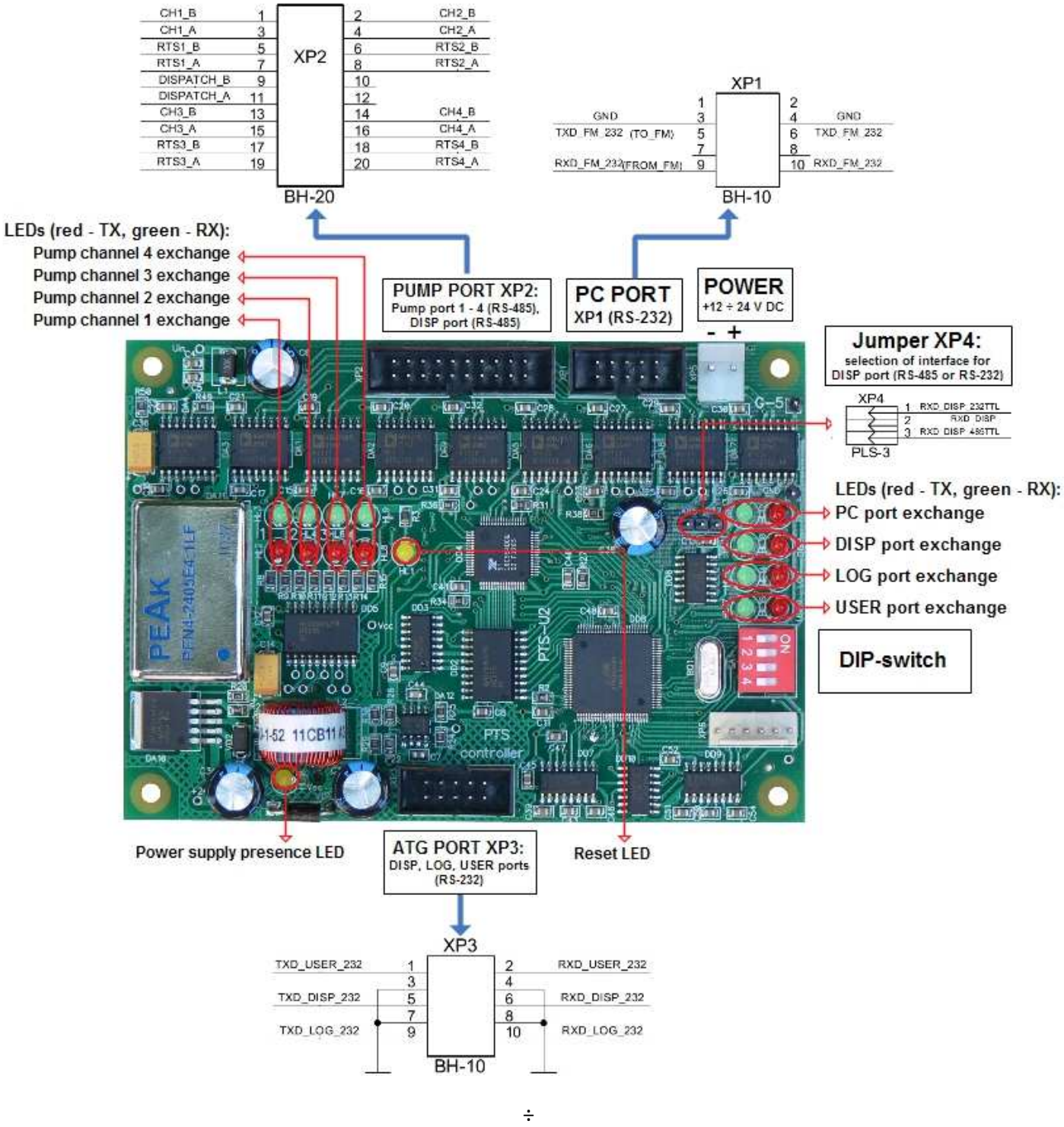
* - may demand using interface converter board to RS-485 interface. See connection schemes.

In some dispensers actual baud rates can differ from specified in a table above due to usage of non-standard electronics inside dispensers.

SUPPORTED ATG SYSTEMS

ATG SYSTEM BRAND	PROTOCOL NAME	BAUD RATE
GILBARCO Veeder-Root (TLS-2, TLS-300, TLS-350, TLS-450)	GILBARCO VEEDER ROOT	1200, 2400, 4800, 9600
OPW	GILBARCO VEEDER ROOT	1200, 2400, 4800, 9600
INCON	GILBARCO VEEDER ROOT	1200, 2400, 4800, 9600
LABKO	GILBARCO VEEDER ROOT	1200, 2400, 4800, 9600
OMNTEC	GILBARCO VEEDER ROOT	1200, 2400, 4800, 9600
ENRAF	ENRAF Height-, Volume-protocol	9600
START ITALIANA	START ITALIANA SMT/XMT	9600
PETRO VEND	PETROVEND4	1200, 2400, 4800, 9600
STRUNA	STRUNA Kedr spec. 1.4	9600
FAFNIR	FAFNIR VISY-Quick	9600
FAFNIR	GILBARCO VEEDER ROOT	1200, 2400, 4800, 9600
ASSYTECH	ASSYTECH	9600
HECTRONIC	HECTRONIC HLS	9600

PTS CONTROLLER BOARD CONNECTORS AND INTERFACES



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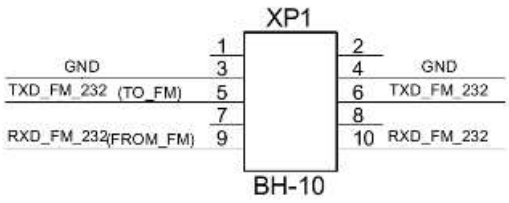
NOTE! Jumper XP4 serves for selection of DISP channel interface between RS-485 and RS-232.

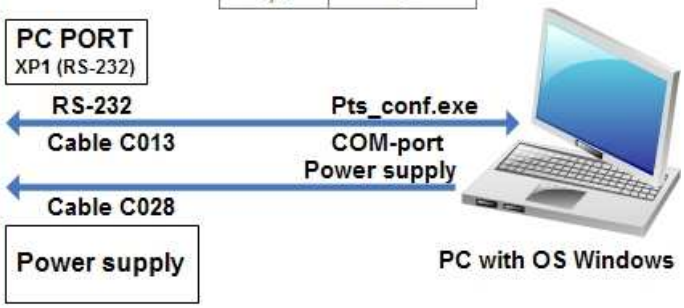
PTS CONTROLLER CONFIGURATION

Use pts_conf.exe utility to make configuration of the PTS controller.

Scheme of connections:



XP1	COM-port
5,6	2
9,10	3
3,4	5



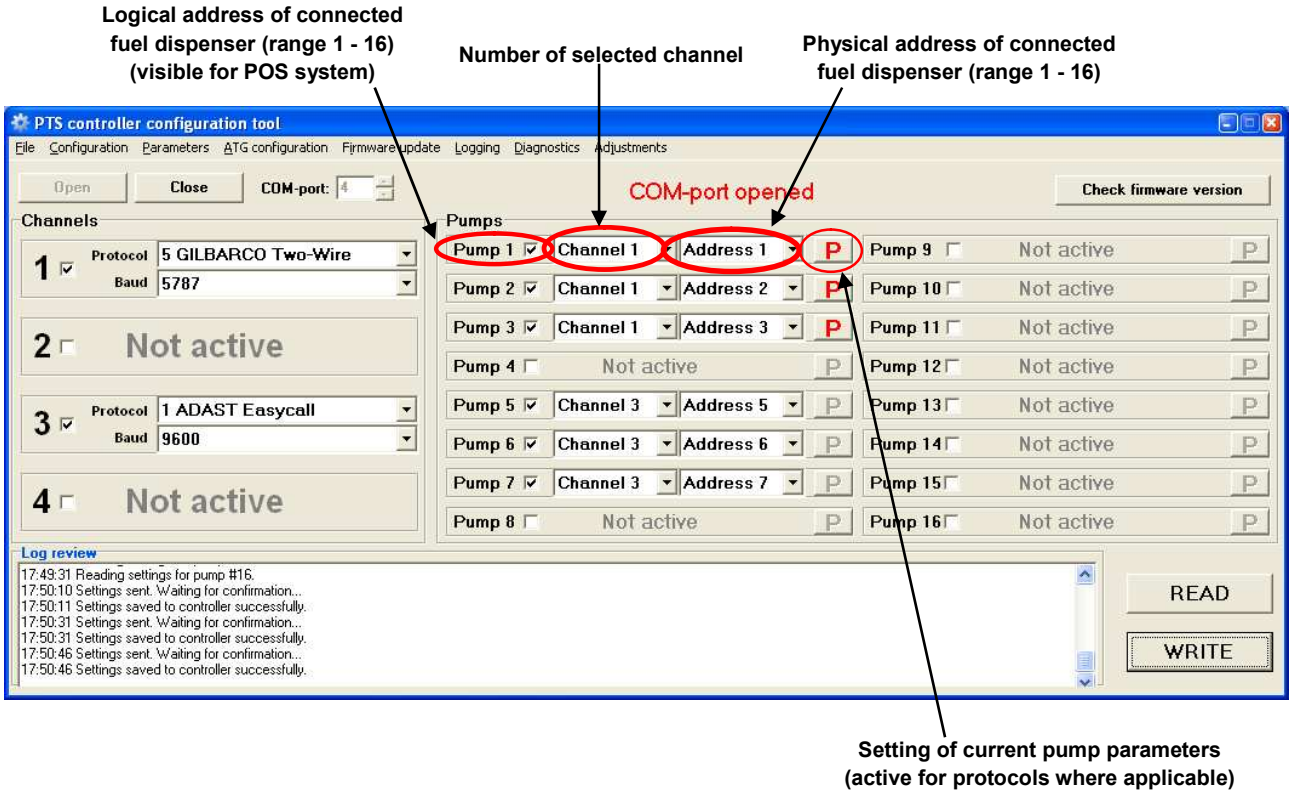
NOTE! On some PCs for correct operation COM-port FIFO settings should be adjusted to Tx: 1, Rx: 1.

Configuration:

Pts_conf.exe tool serves for configuration of PTS controller. It provides the following possibilities:
- configuration of pumps (fuel dispensers) channels
- configuration of ATG systems (probes) channels
- configuration of pumps (fuel dispensers) parameters
- configuration of PTS controller parameters
- configuration of logging parameters
- update of the PTS controller firmware
- taking logs from PTS controller
- self-diagnostics of PTS controller interfaces and switches
- saving to file from PTS controller of all parameters
- loading from file to PTS controller all parameters

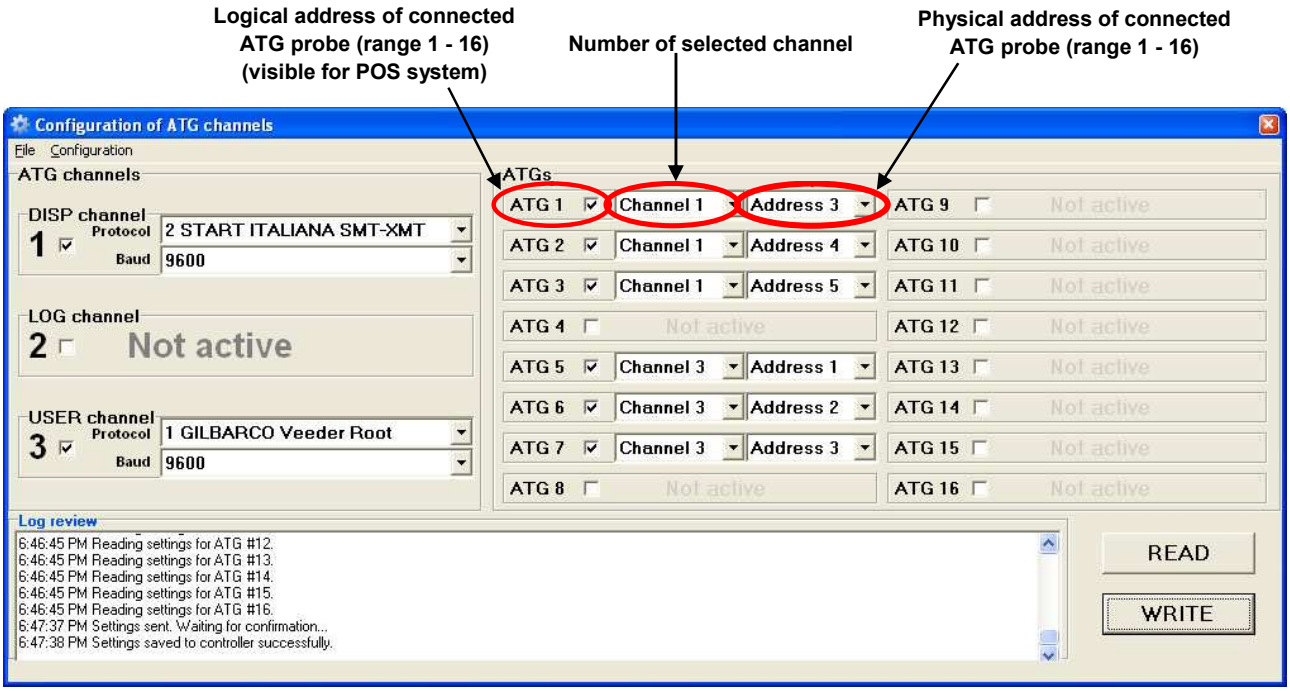
Run pts_conf.exe tool. Make sure that in main menu in tab "Adjustments" type of PTS controller connection "Direct connection of controller to PC" is selected (other types of connection serve for connection of PTS controller through fiscal modules). Set up a correct COM-port number and press "Open" button. By checking checkboxes near pump channels and pumps and selecting addresses of connected pumps set correct PTS controller configuration according to connected fuel dispensers (correspondence between connected fuel dispensers physical addresses, logical addresses (visible for a POS system) and

selected channels) and press a button “WRITE”. Configuration includes setting of pump channels’ communication protocols, baud rates, logical and physical addresses of dispensers that are connected to specified channels. To read current configuration of the PTS controller use a button “READ”. Current configuration of PTS controller can be saved to a file on a hard drive for future usage (select in main menu a tab ‘File’ → ‘Save As’ to save configuration or ‘File’ → ‘Open’ to open configuration from file).



Communication protocols that are present inside the PTS controller depend on its firmware version. To find out current firmware version of the PTS controller press “Check firmware version” button.

For configuration of ATG systems select in main menu in tab “ATG configuration” an item “Configuration of ATG channels”. By checking checkboxes near ATG channels and ATGs and selecting addresses of connected ATGs set correct PTS controller configuration according to connected ATG probes and consoles (correspondence between connected ATG probe’s physical addresses, ATG probe’s logical addresses (visible for a POS system) and selected ATG channels) and press a button “WRITE”. Configuration includes setting of ATG channels’ communication protocols, baud rates, logical and physical addresses of ATG probes that are connected to specified ATG channels. To read current configuration of the PTS controller use a button “READ”. Current configuration of PTS controller can be saved to a file on a hard drive for future usage (select in main menu a tab ‘File’ → ‘Save As’ to save configuration or ‘File’ → ‘Open’ to open configuration from file).

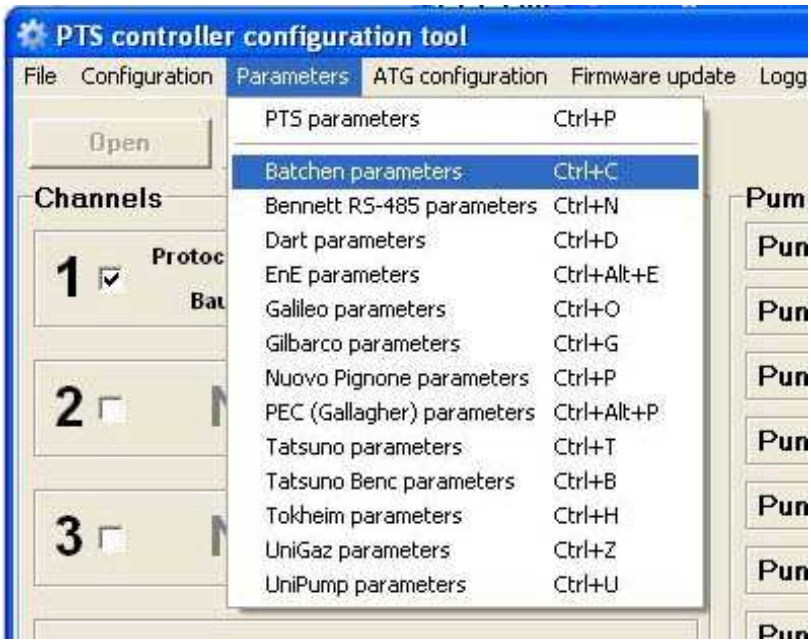


PTS PARAMETERS

Parameters in PTS controller include

- parameters for configuration of fuel dispensers protocols
- parameters for ATG systems
- parameters for PTS controller
- parameters for selection of a channel to log

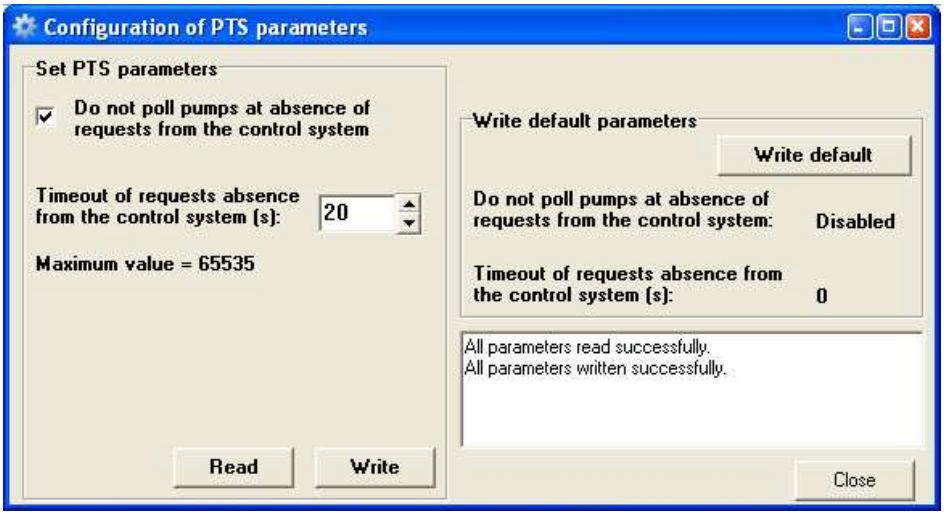
Due to a reason that various fuel dispensers are supplied worldwide with various country configurations (quantity of digits in price and cost per liter/gallon, mode of dispenser operation and dispenser type, quantity of nozzles per side, etc) – for flexibility of adjustment of PTS controller operation with such dispensers special parameters in PTS controllers are foreseen. Adjustment of parameters for every separate communication protocol is made using a main menu tab "Parameters".



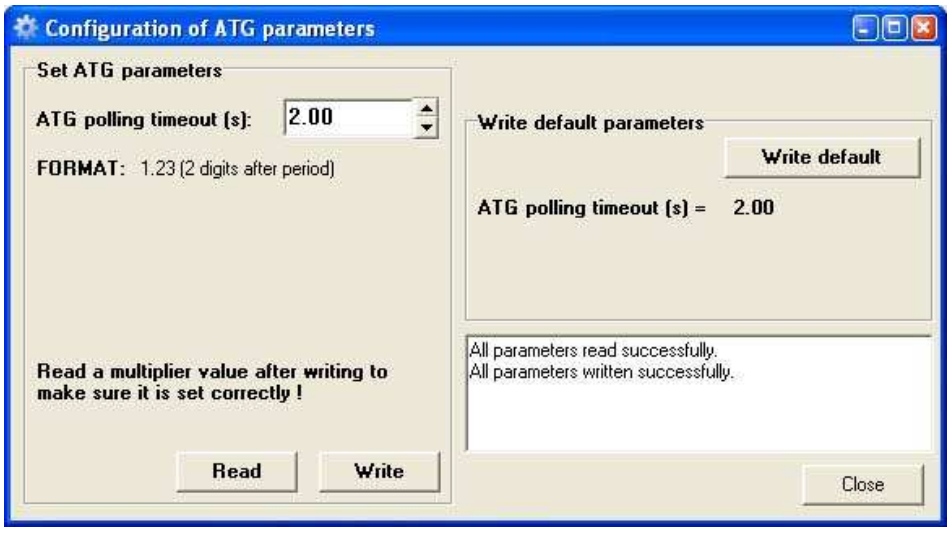
At configuration of PTS controller for such fuel dispensers that have parameters in PTS controller a warning message will be shown (after clicking a button 'WRITE' to save configuration):

Specified parameters for each of the supported dispensers are self-explanatory and should be adjusted prior to working with a fuel dispenser because if the parameters are configured incorrectly or are not set at all – the dispenser may function incorrectly or not function.

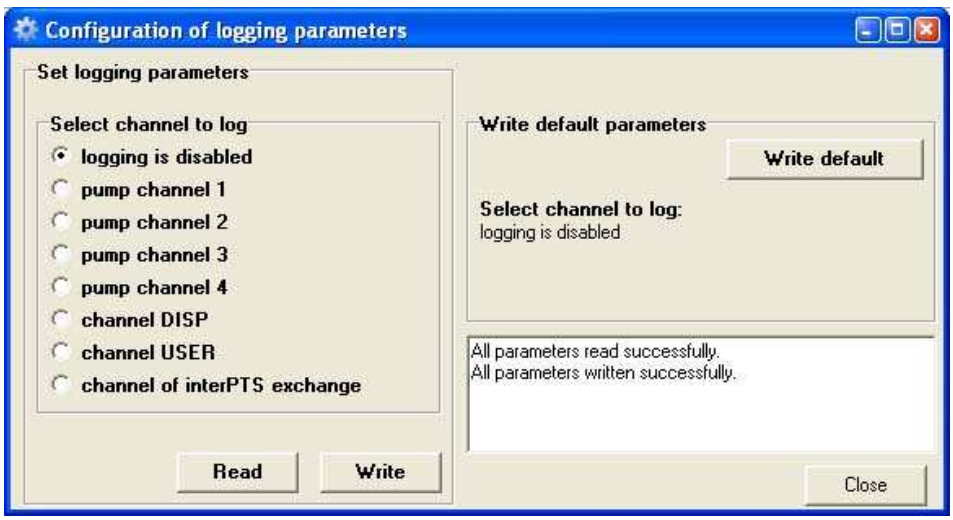
Adjustment of PTS controller parameters is performed in a form, called from main menu tab ‘Parameters’ → ‘PTS parameters’ and include general parameters for whole PTS controller operation.



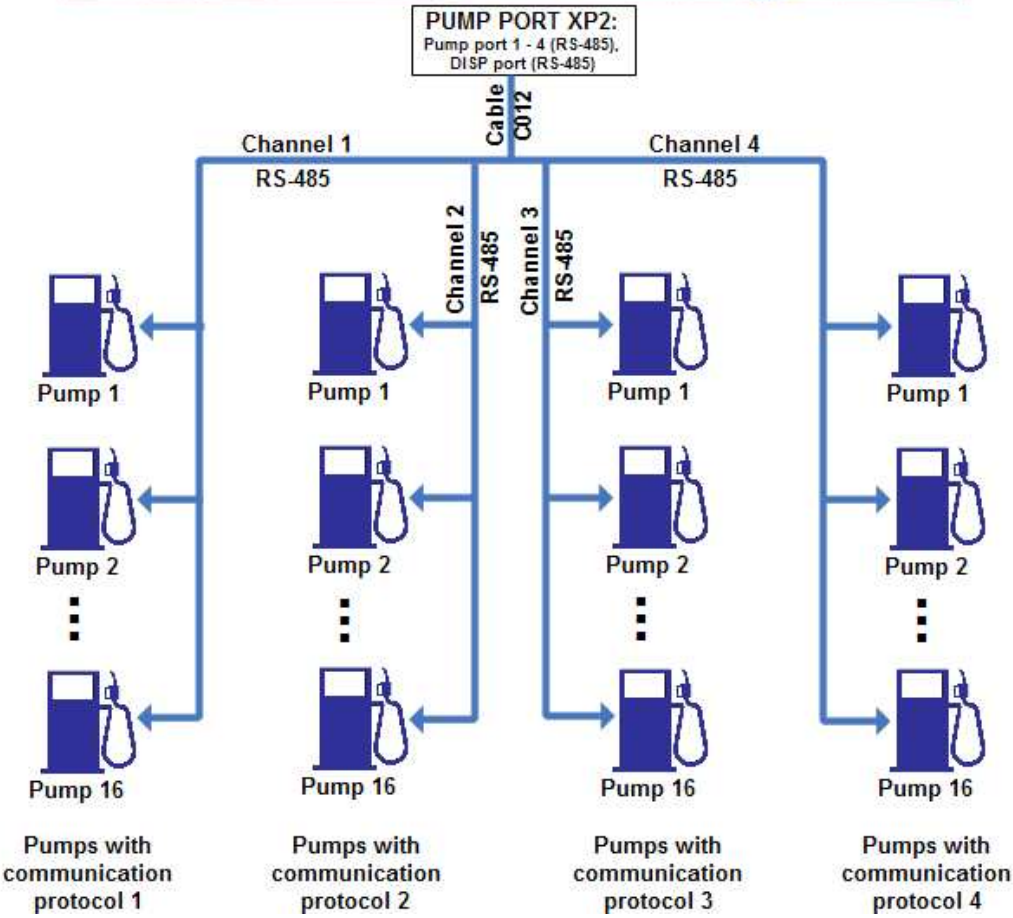
Adjustment of ATG systems parameters is performed in a form, called from main menu tab ‘ATG configuration’ → ‘ATG parameters’ and include general parameters for ATG systems:



Logging parameters provide selection of a channel to be logged (see section “PTS controller logging”), a form for configuration is called from main menu tab ‘Logging’ → ‘Logging parameters’:



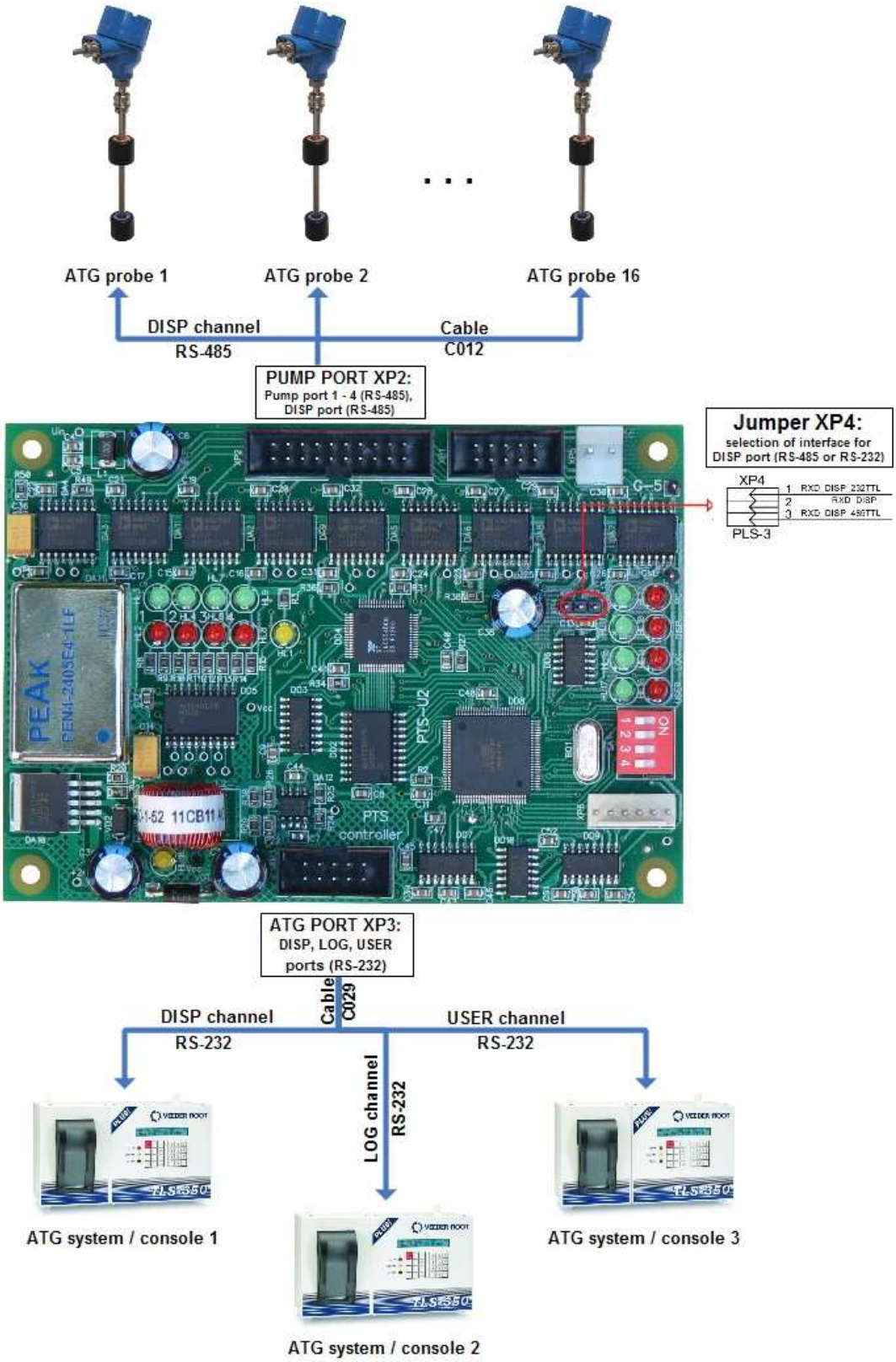
CONNECTION OF FUEL DISPENSERS



PTS controller can simultaneously control up to 16 fueling places (16 sides of 1-sided dispensers or 8 sides of 2-sided fuel dispensers) that use up to 4 various communication protocols (each of the pump channels can be adjusted to a separate communication protocol and baud rate and connect up to 16 fueling places).

NOTE: if there are less than 4 various types of fuel dispensers at petrol station (which use various exchange protocols) – it is recommended to distribute fuel dispensers between 4 PTS controller channels in approximately equal quantities in order to minimize delays between fuel dispensers querying in the same channel.

CONNECTION OF ATG SYSTEMS



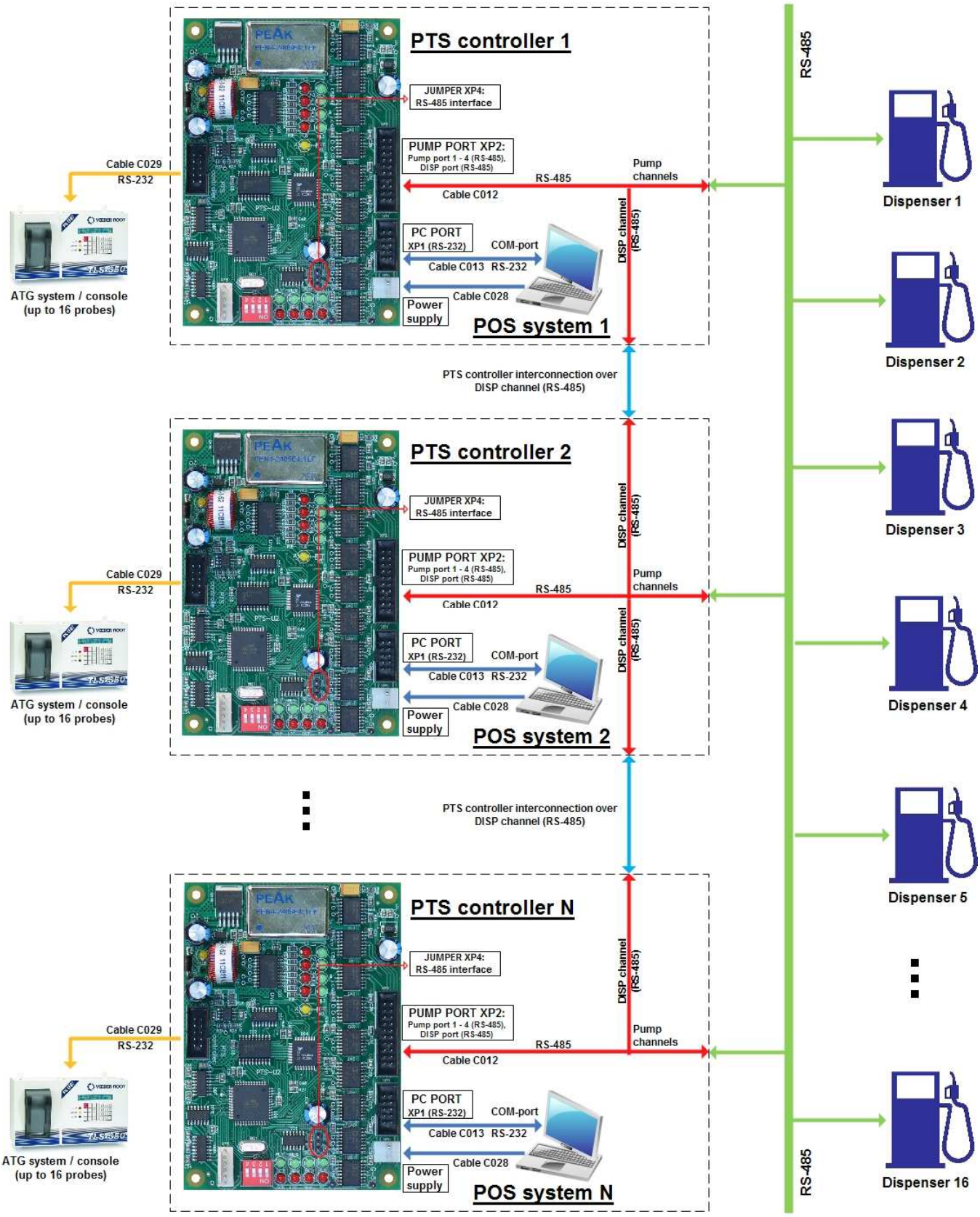
PTS controller can simultaneously control up to 16 ATG probes (gauges) (separate probes or probes connected to ATG systems / consoles) that use up to 3 various communication protocols (each of the ATG channels can be adjusted to a separate communication protocol and baud rate and connect up to 16 ATG probes).

NOTE: DISP channel provides a possibility to connect ATG system (probes) over either RS-485 or RS-232 interfaces – interface is selected using a jumper XP4, located on PTS PCB board.

PTS CONTROLLER MULTI POS SYSTEMS OPERATION

PTS controller allows a possibility to lead management over the same fuel dispensers from several POS systems and share ATG probes measurement values between several interconnected PTS controllers. Thus every PTS controller will be able to provide control over any of the connected fuel dispensers and know ATG system measurement data of every other interconnected PTS controller.

Scheme of PTS controllers interconnections:



NOTE! In order to enable PTS interconnection a jumper XP4 should be selected for DISP RS-485 interface and DISP channel should not be configured for any ATG system (see section “PTS controller configuration”).

Configuration:

At necessity to organize several working places at petrol station (several POS systems) each of the POS systems should have its own PTS controller connected. PTS controllers should be interconnected with each other through a dispatcher PTS port (DISP channel on RS-485 interface) and with fuel dispensers. Thus control over each fuel dispenser at petrol station can be made from every POS system and each PTS controller will know measurement data of every ATG probe connected to any of the interconnected PTS controllers. At authorization of a fuel dispenser from one POS system the fuel dispenser becomes locked by PTS controller of this POS system and while it is locked all other POS systems can not control over given fuel dispenser, they can only monitor current state of the fuel dispenser. When operation of given POS system is finished with given fuel dispenser, PTS controller of this POS system unlocks the fuel dispenser and it becomes commonly available for all other PTS controllers, which makes it possible to be controlled (locked) by any of the PTS controllers connected to other POS systems.

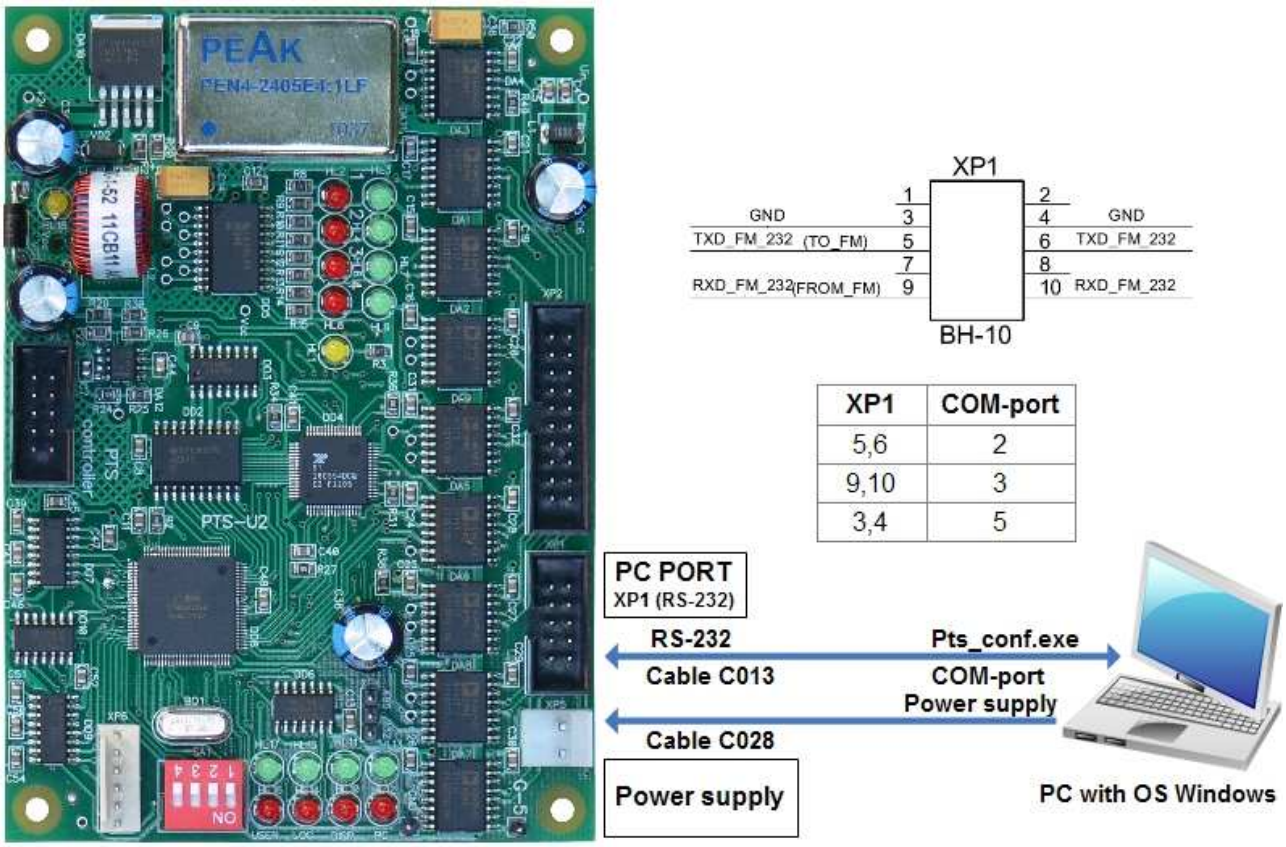
NOTE! In order to provide correct exchange of ATG systems measurement data between interconnected PTS controllers logical addresses of connected ATG probes in configuration of interconnected PTS controllers should not intersect.

PTS CONTROLLER FIRMWARE UPDATE

PTS controller firmware is constantly being improved and new communication protocols are added. New versions of PTS controller's firmware are available for downloading for customers.

PTS controller firmware update is made using a built-in updater in configuration tool "Pts_conf.exe".

Scheme of connections:



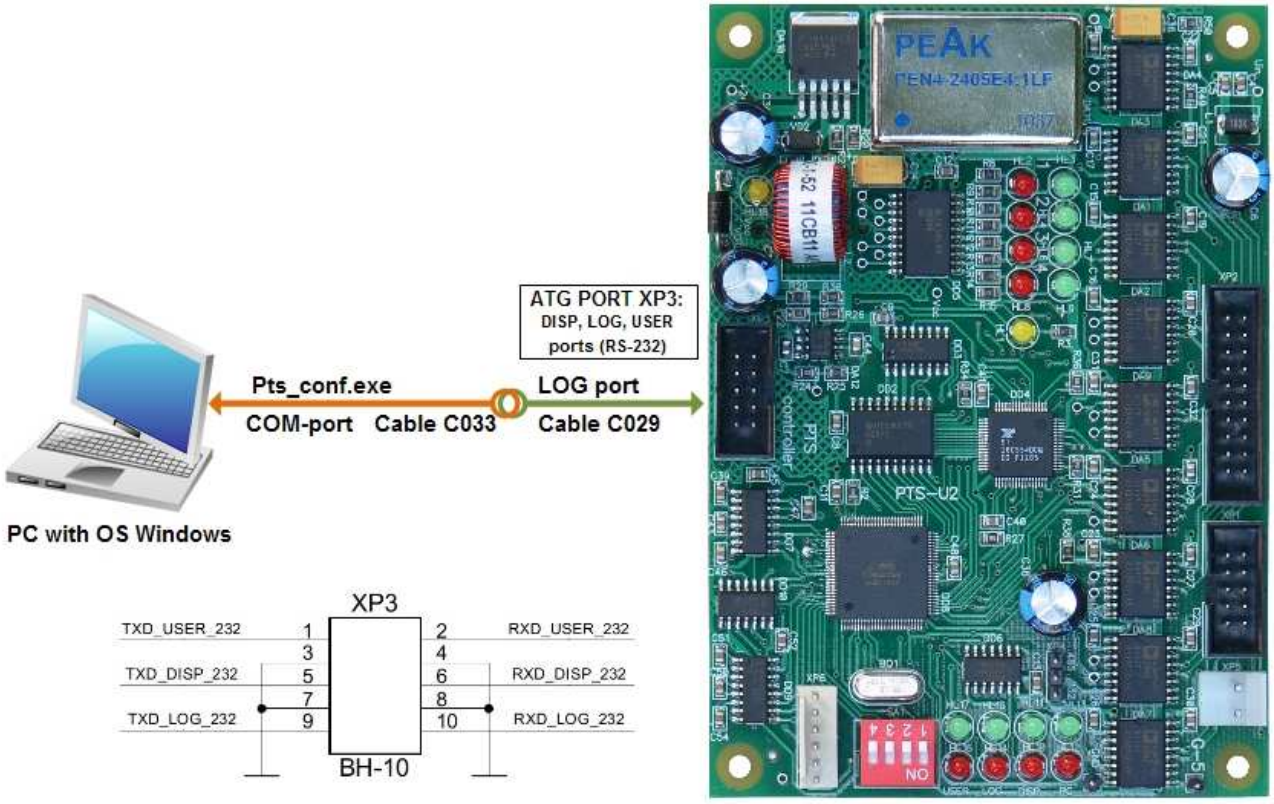
In "Pts_conf.exe" leave a COM-port closed and go to a tab "Firmware update". Select a COM-port of connected PTS controller, path to a file with a new firmware and press a button "UPDATE". Firmware will start to be updated. Wait until the process is finished. In case of any errors - restart a tool and try again.

After the firmware update is completed - check PTS controller configuration in "Pts_conf.exe" tool.

PTS CONTROLLER LOGGING

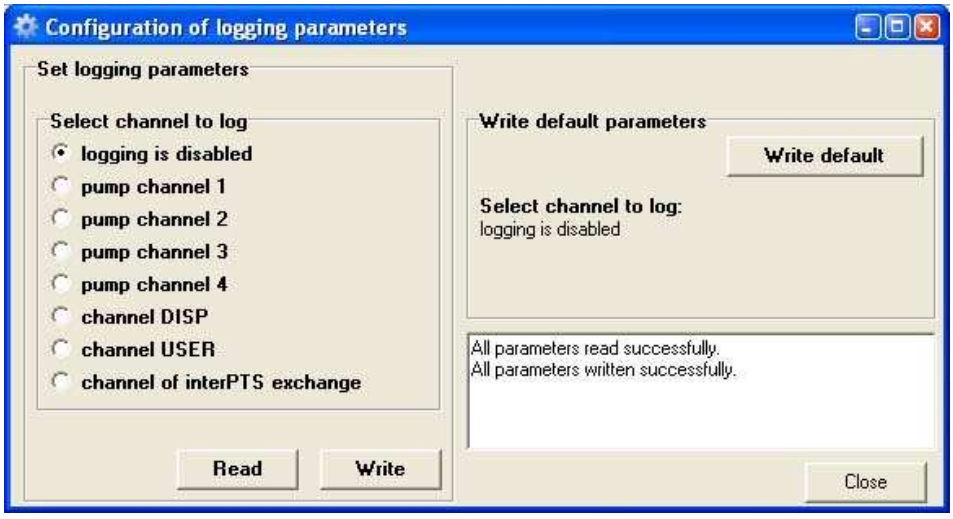
With a reason to quickly locate and remove possible errors in PTS controller communication with connected equipment (fuel dispensers, ATG systems, other PTS controller in PTS interconnection) PTS controller has a possibility of logging of its exchange with connected equipment. Use "Pts_conf.exe" utility to save on a PC exchange logs of PTS controller with fuel dispensers, ATG systems and PTS interconnection.

Scheme of connections:



Configuration:

Logging of PTS controller exchange is intended for tracking of possible problems in PTS controller exchange with fuel dispensers, ATG systems and other PTS controllers in PTS interconnection. Logging is possible only in case if LOG channel is not configured for any ATG system (see section "PTS controller configuration"). Selection of a channel to log is made in a form of configuration of logging parameters (see section "PTS parameters").



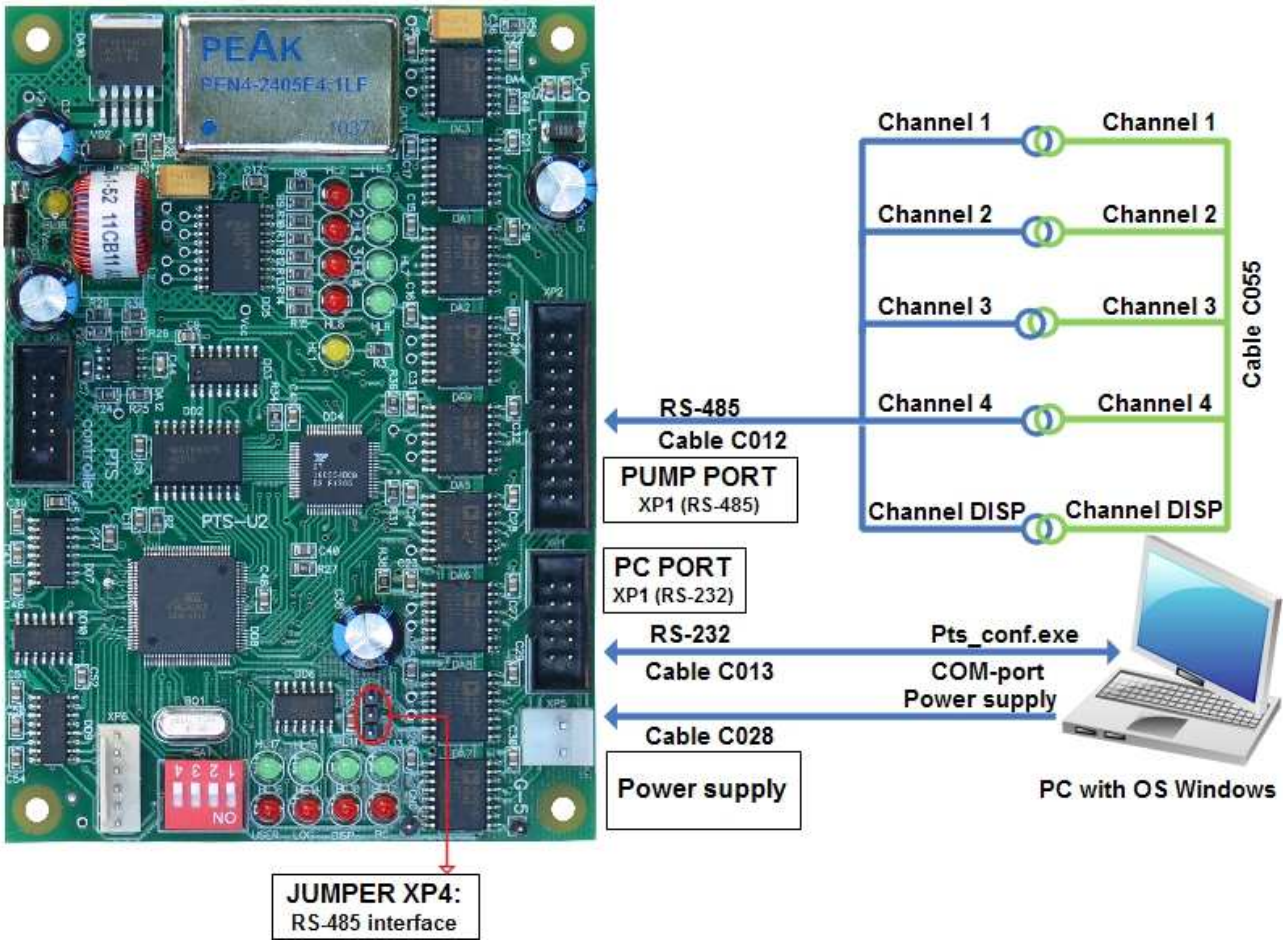
In “Pts_conf.exe” leave a COM-port closed and go to a tab “Logging”. Select a COM-port of connected PTS controller LOG-channel, path to a .bin file, where a log will be stored (by defaults log.bin) and press a button “WRITE LOG”. Log will be accumulated to the file from a channel, adjusted in logging parameters form. As an evidence of it logged data will be displayed on the screen. To stop logging press a button ”STOP LOGGING”. In case of any errors – restart a tool and try again.

Data displayed on the screen is a log in encrypted form. After a log of exchange is taken it is required to pass a received .bin file to “TECHNOTRADE LTD” for examining and elimination of possible problems, for reasons of which it was taken.

PTS CONTROLLER DIAGNOSTICS

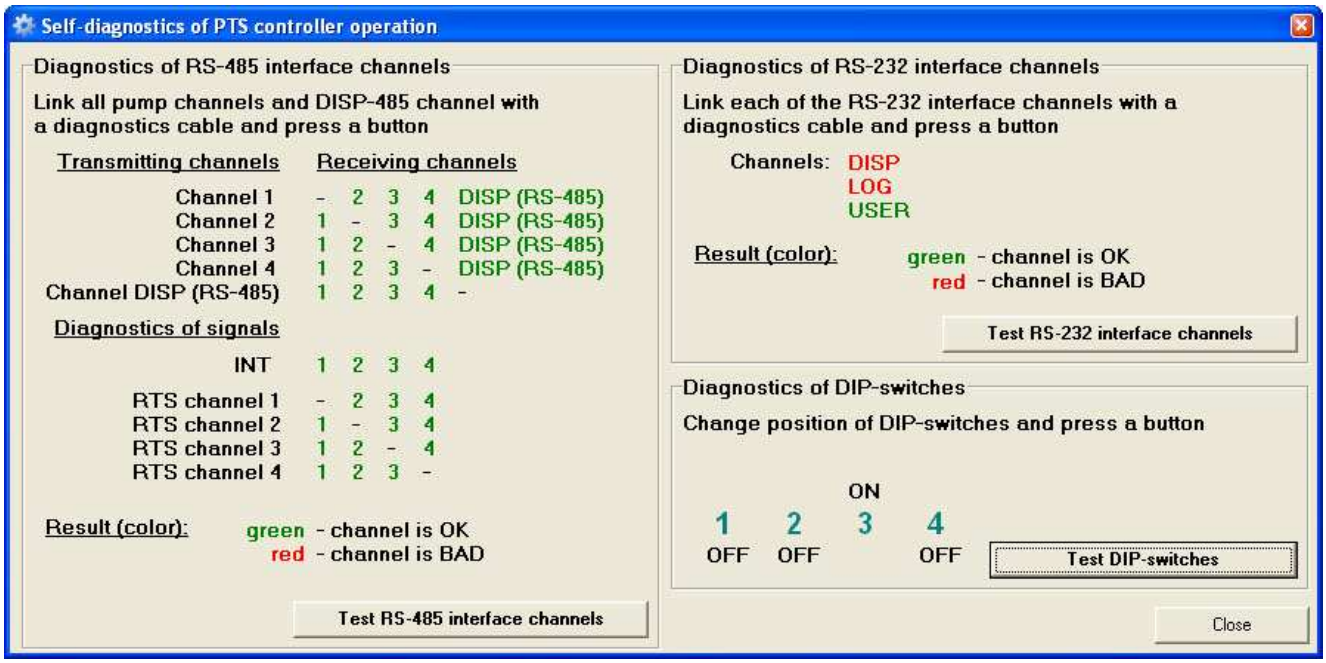
With a reason to quickly provide diagnostics of PTS controller's RS-485 and RS-232 interfaces and DIP-switches a special diagnostics of PTS controller is used. Use "Pts_conf.exe" utility to check diagnostics of PTS controller.

Diagnostics of 485 interfaces:

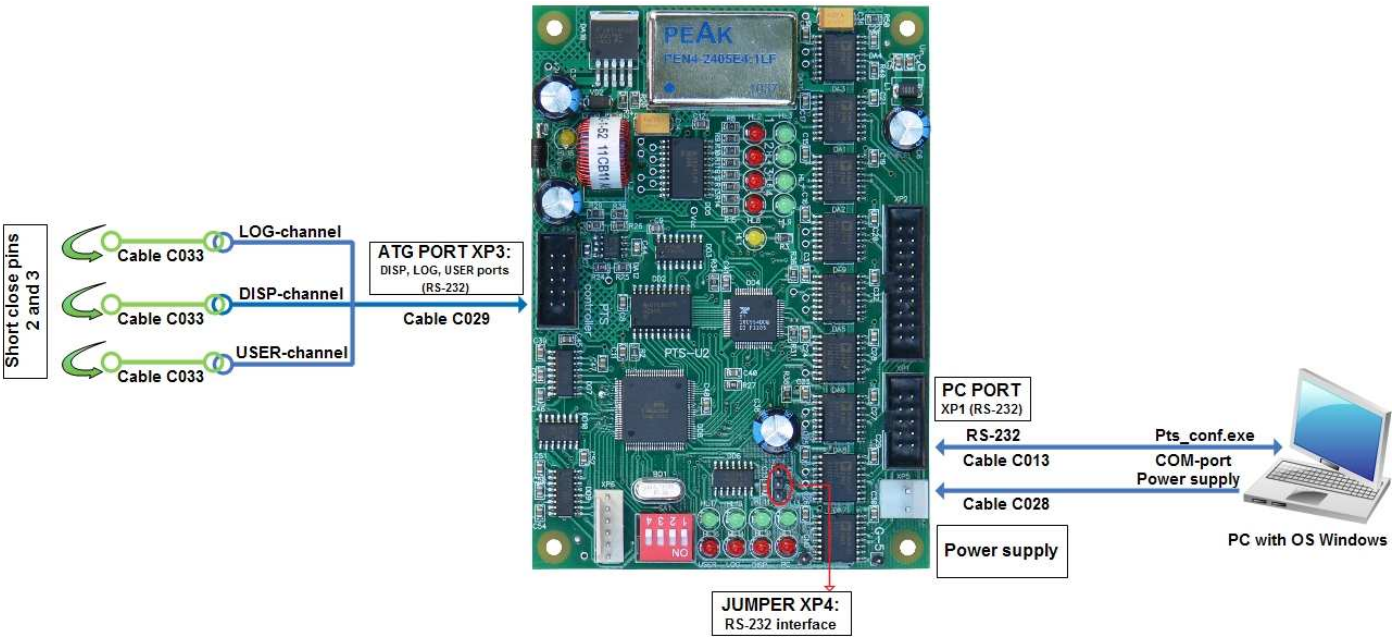


Configuration:

In order to check RS-485 interfaces connect all RS-485 connectors of C012 cable with appropriate connectors of diagnostics cable C055 (connector X1 to connector X1, X2 – to X2, X3 – to X3 and so on). Close XP4 jumper on the board of PTS controller to position RS-485. Open "Pts_conf.exe" tool, open a COM-port, to which PTS controller is connected, and go to tab "Self-diagnostics". Press a button "Test RS-485 interface channels". On the tab "Diagnostics of RS-485 interface channels" results of diagnostics will be shown by color of labels. Green color means that correspondent channel is working correctly (OK), red color – correspondent channel is working incorrectly (BAD).



Diagnostics of 232 interfaces:

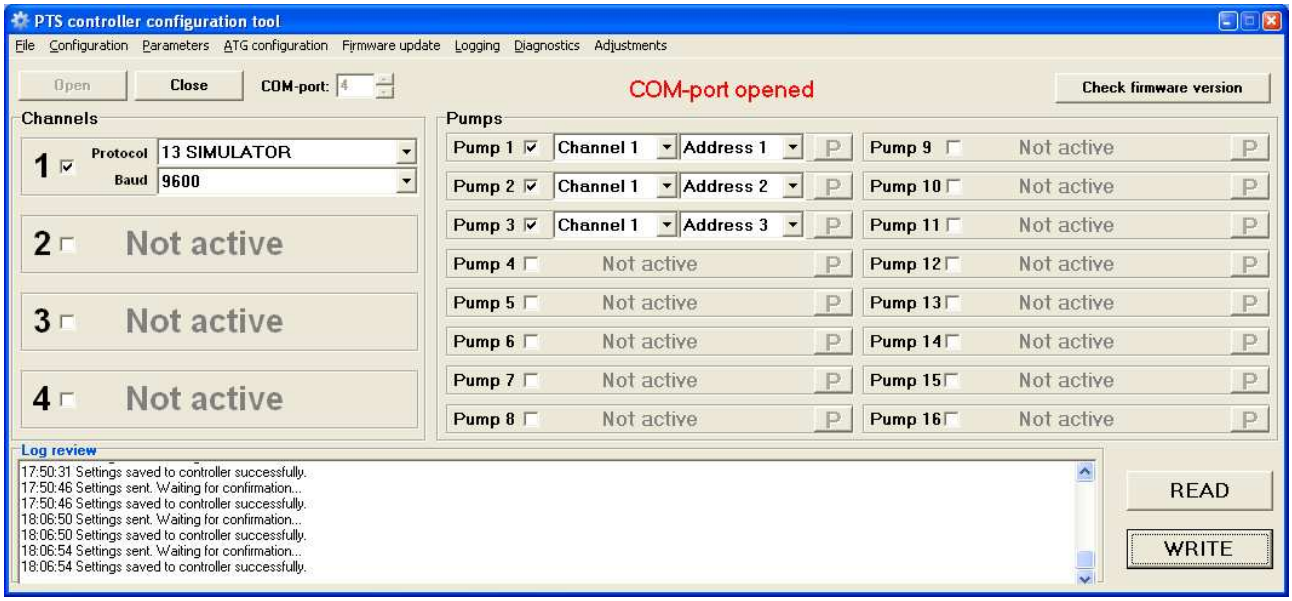


In order to check RS-232 interfaces (ports USER, LOG, DISP on cable C029 or on cable C033, which is connected to cable C029) connect pins 2 (Tx) with pins 3 (Rx) on each of these ports. Close XP4 jumper on the board of PTS controller to position RS-232. Press a button “Test RS-232 interface channels”. On the tab “Diagnostics of RS-232 interface channels” results of diagnostics will be shown by color of labels. Green color means that correspondent channel is working correctly (OK), red color – correspondent channel is working incorrectly (BAD).

In order to check DIP-switches use a button “Test DIP-switches”, which will display current position of switches in a DIP-switch on PTS board. If displayed position of switches correspond to real position of switches in a DIP-switch on PTS board after checking them in various positions – then DIP switch is working correctly.

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.



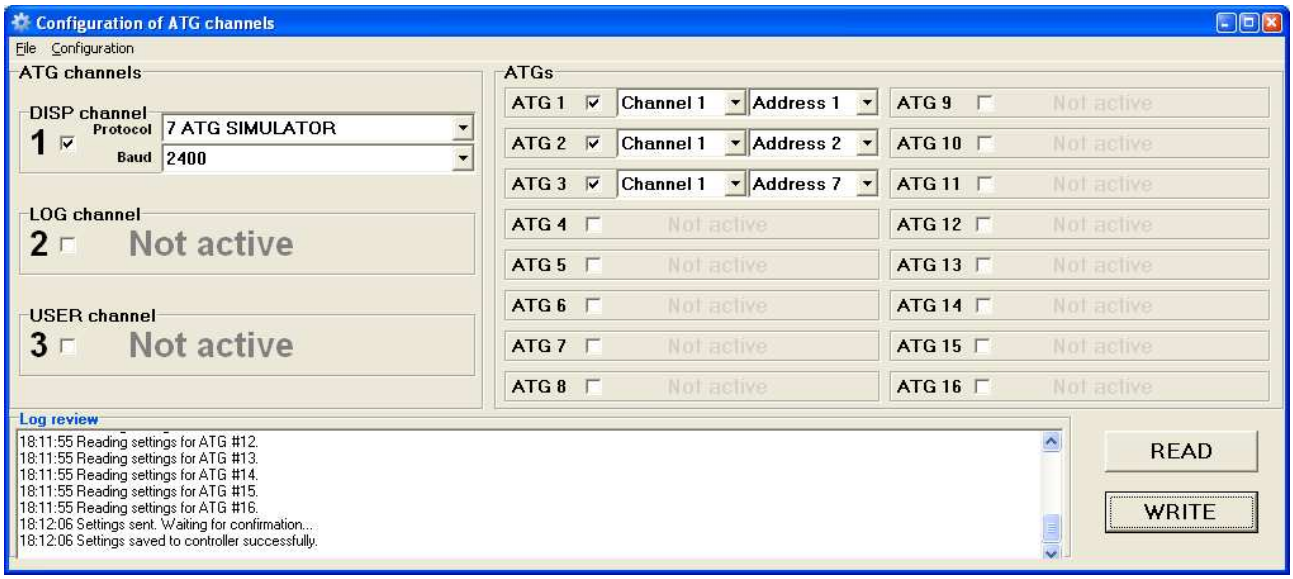
At this the dispenser has only nozzle 1 and it is always taken up.
It is possible to:

- 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.

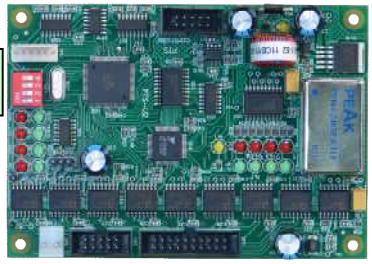
For addresses 2-16: statically fixed measurement values:

- 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)

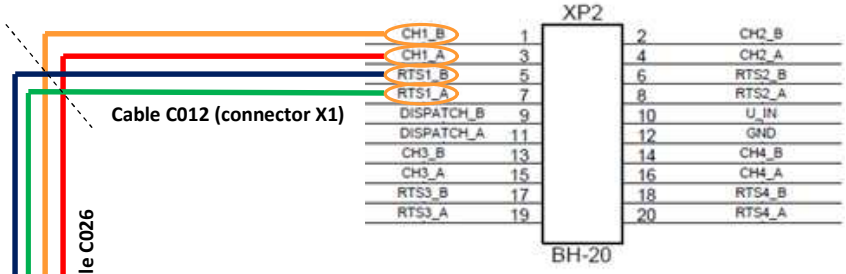
GILBARCO DISPENSER CONNECTION SCHEME

Configuration of PTS controller: protocol **GILBARCO Two-Wire**, baud rate **5787**

Connection through pump channel 1 of PTS controller (example)



Pump port (XP2): pump channel 1 (RS-485)



Cable C012 (connector X1)

Cable C026

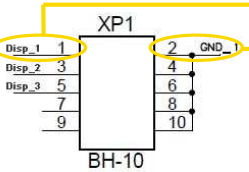
+5 V
GND
GND
+12 V

Cable C032

Gilbarco fuel dispenser interface converter (more info …)

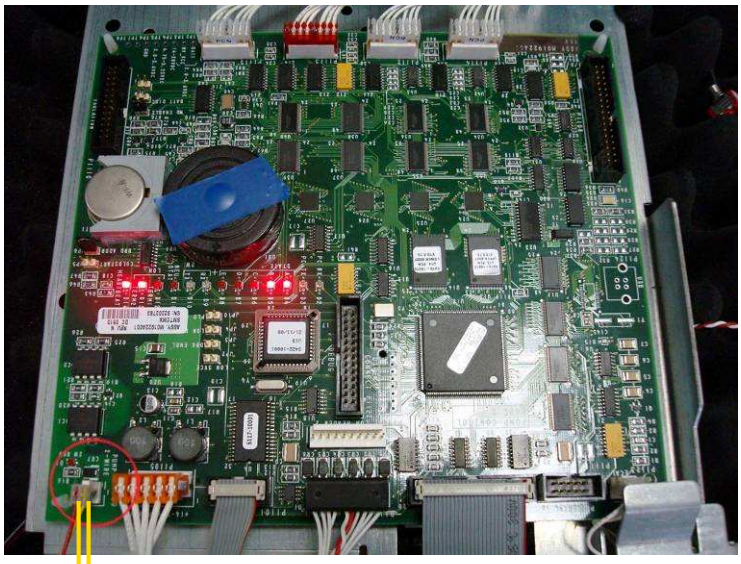
Pump port (XP1): pump channels 1, 2, 3

Pump port (XP2): pump channels 4, 5, 6



Connection through first channel of Gilbarco converter (example)

Cable C027

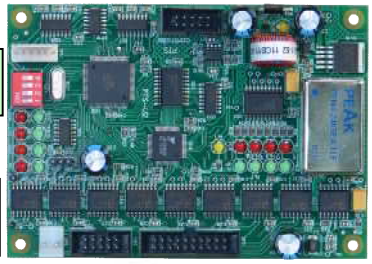


Gilbarco Encore 500 dispenser board

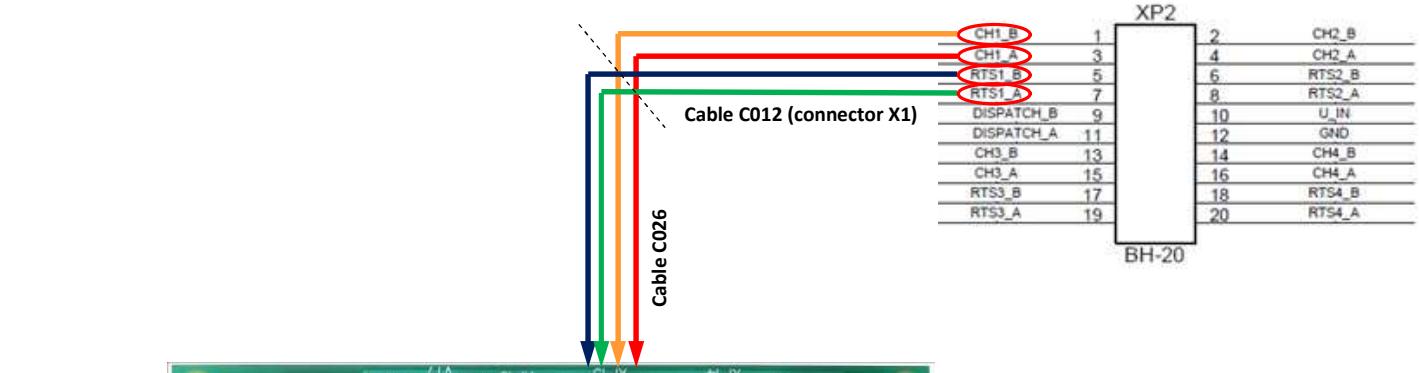
GILBARCO DISPENSER CONNECTION SCHEME

Configuration of PTS controller: protocol **GILBARCO Two-Wire**, baud rate **5787**

Connection through pump channel 1 of PTS controller (example)



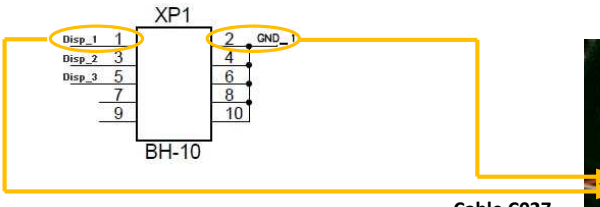
Pump port (XP2): pump channel 1 (RS-485)



Gilbarco fuel dispenser interface converter (more info …)

Pump port (XP1): pump channels 1, 2, 3

Pump port (XP2): pump channels 4, 5, 6



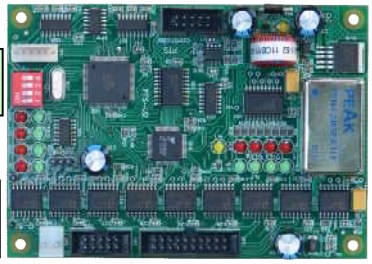
Connection through first channel of Gilbarco converter (example)

Gilbarco dispenser ASSY M06104A001 rev. B board

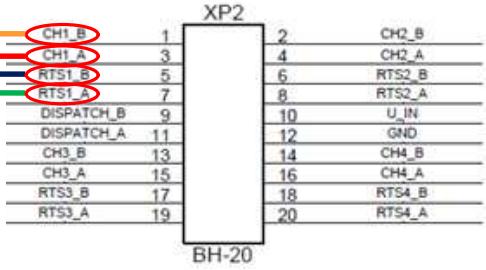
GILBARCO DISPENSER CONNECTION SCHEME

Configuration of PTS controller: protocol **GILBARCO Two-Wire**, baud rate **5787**

Connection through pump channel 1 of PTS controller (example)



Pump port (XP2): pump channel 1 (RS-485)



Cable C012 (connector X1)

Cable C026

+5 V
GND
GND
+12 V

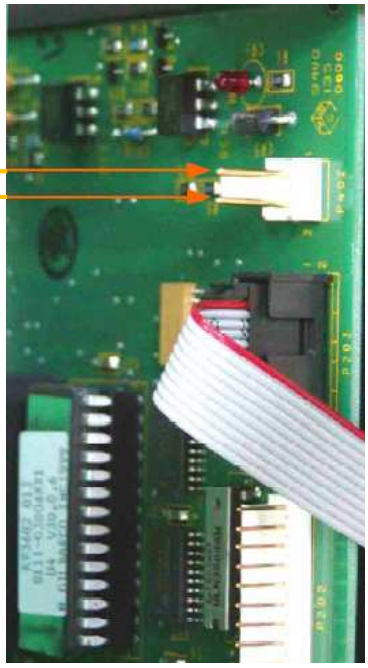
Cable C032

Gilbarco fuel dispenser interface converter (more info …)

Pump port (XP1): pump channels 1, 2, 3

Pump port (XP2): pump channels 4, 5, 6

Cable C027



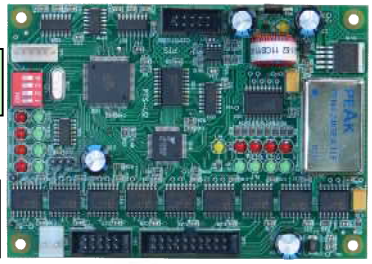
Gilbarco dispenser board

Connection through first channel of Gilbarco converter (example)

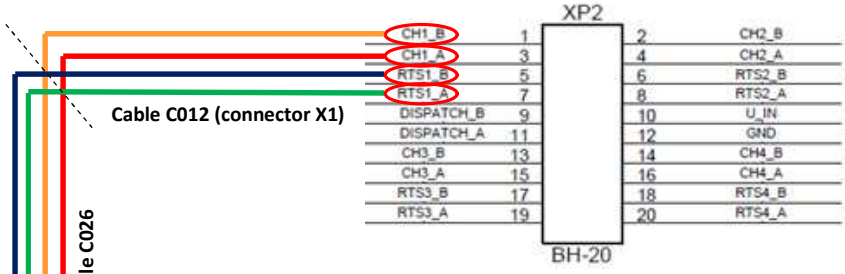
GILBARCO DISPENSER CONNECTION SCHEME

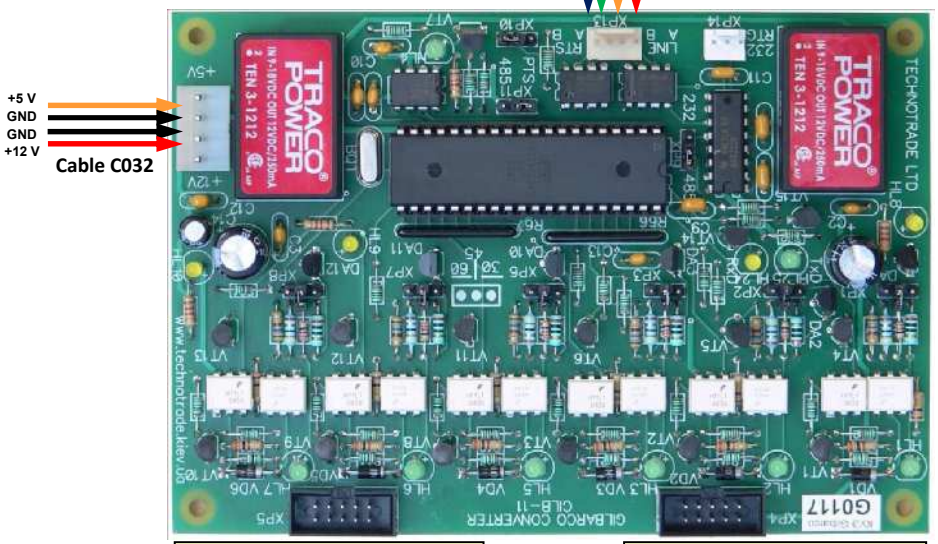
Configuration of PTS controller: protocol **GILBARCO Two-Wire**, baud rate **5787**

Connection through pump channel 1 of PTS controller (example)



Pump port (XP2): pump channel 1 (RS-485)

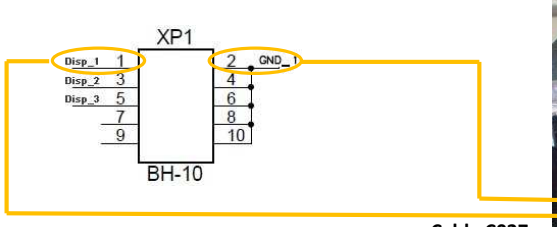




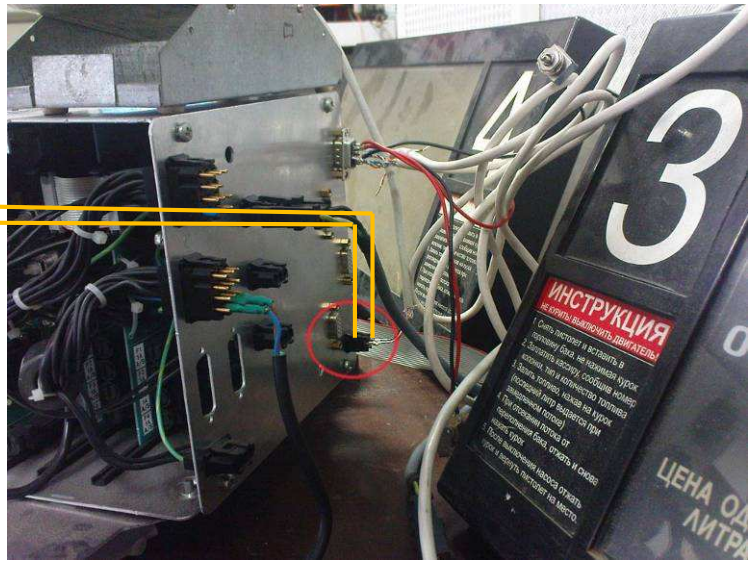
Gilbarco fuel dispenser interface converter (more info …)

Pump port (XP1): pump channels 1, 2, 3

Pump port (XP2): pump channels 4, 5, 6



Connection through first channel of Gilbarco converter (example)

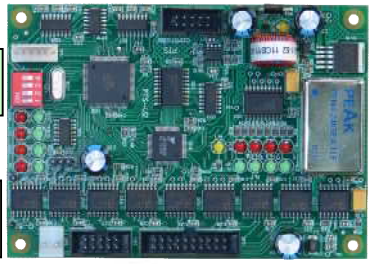


Gilbarco Euroline dispenser board

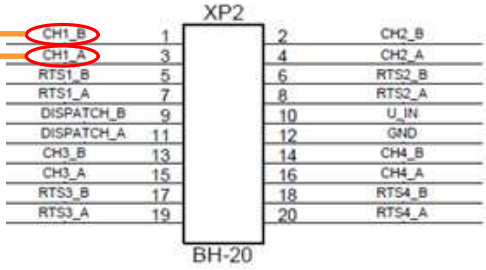
WAYNE DRESSER DISPENSER CONNECTION SCHEME

Configuration of PTS controller: protocol **WAYNE Dart**, baud rate **9600**

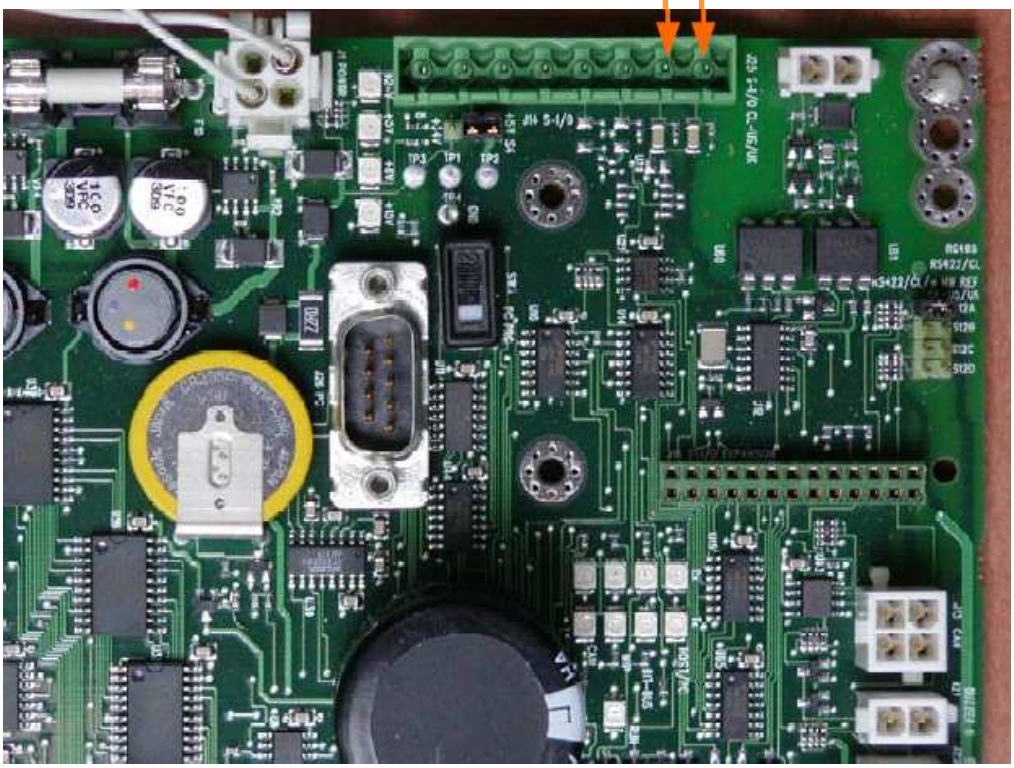
Connection through pump channel 1 of PTS controller (example)



Pump port (XP2): pump channel 1 (RS-485)



Cable C012 (connector X1)

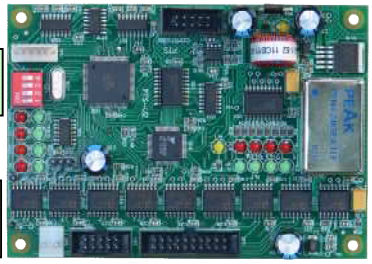


Wayne Dresser iGem dispenser motherboard

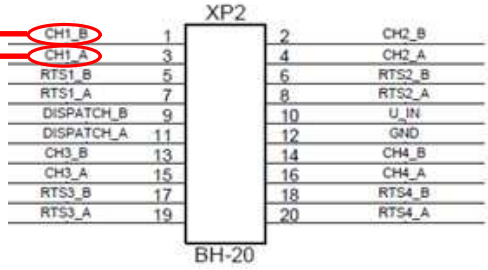
TATSUNO DISPENSER CONNECTION SCHEME

Configuration of PTS controller: protocol **TATSUNO SS-LAN**, baud rate **19200**

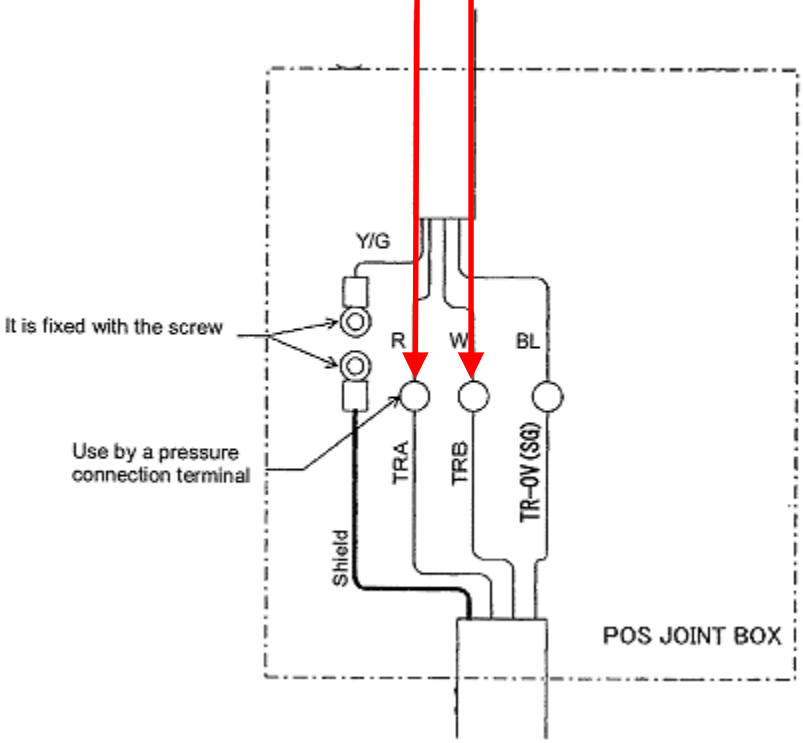
Connection through pump channel 1 of PTS controller (example)



Pump port (XP2): pump channel 1 (RS-485)



Cable C012 (connector X1)

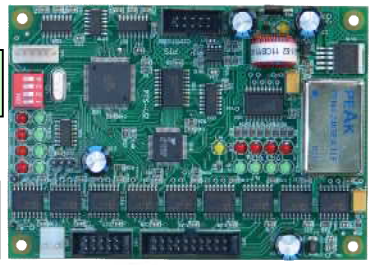


TATSUNO POS joint box

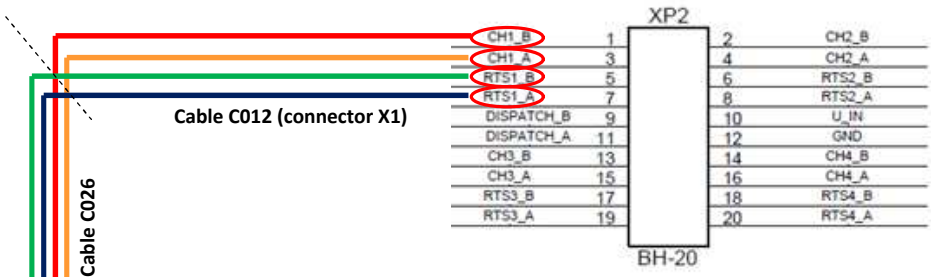
TOKHEIM DISPENSER CONNECTION SCHEME

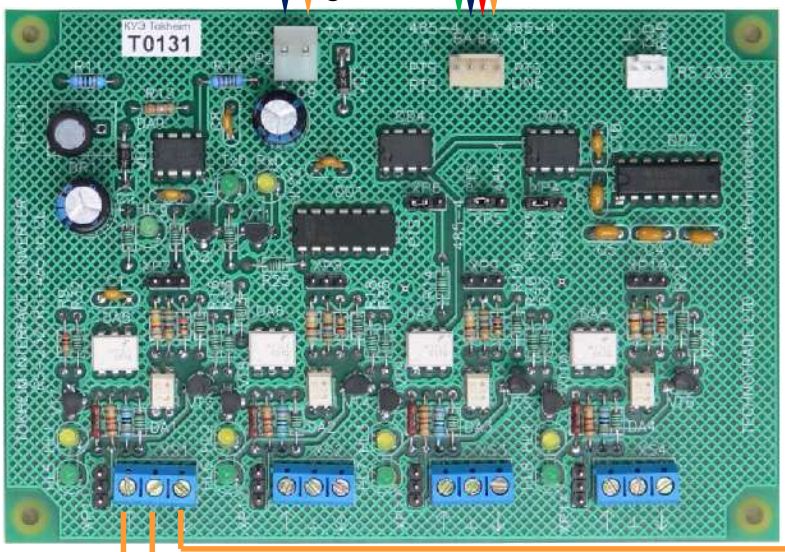
Configuration of PTS controller: protocol **TOKHEIM**, baud rate **9600**

Connection through pump channel 1 of PTS controller (example)



Pump port (XP2): pump channel 1 (RS-485)



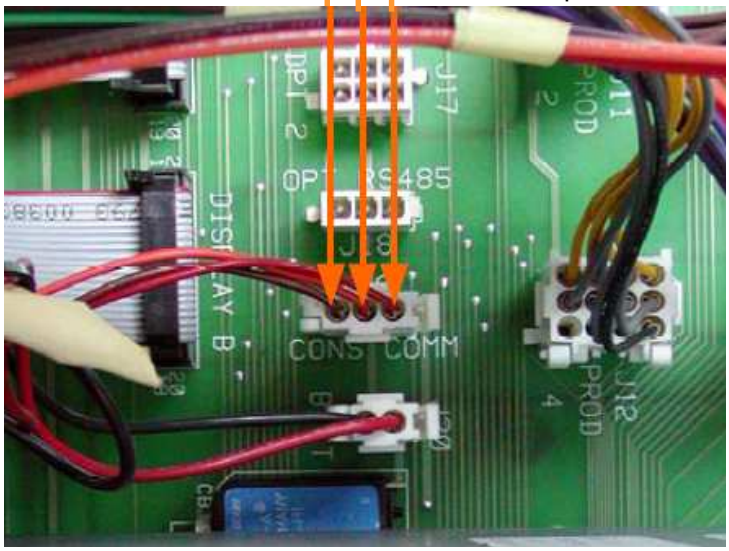


Tokheim fuel dispenser interface converter (more info …)

Connection through first channel of Tokheim converter (example)

TTC
DCC
TTD

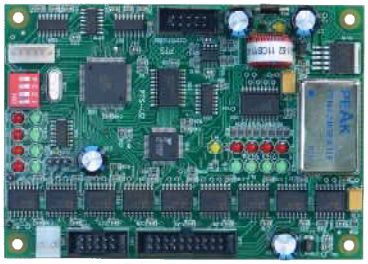
Tokheim dispenser board



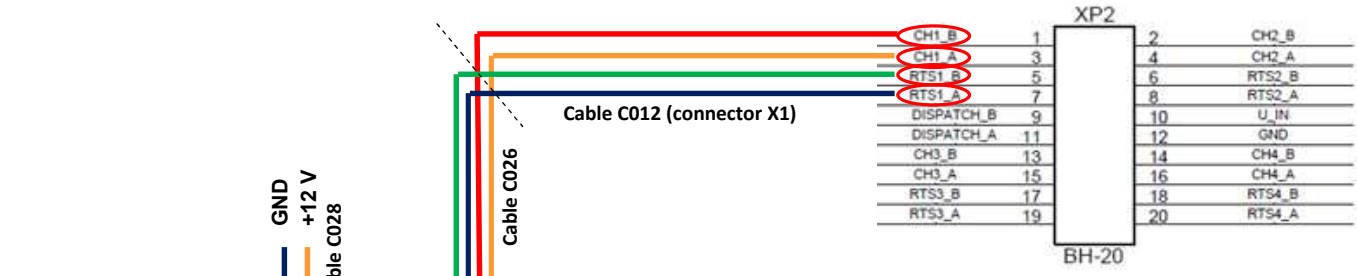
TOKHEIM DISPENSER CONNECTION SCHEME

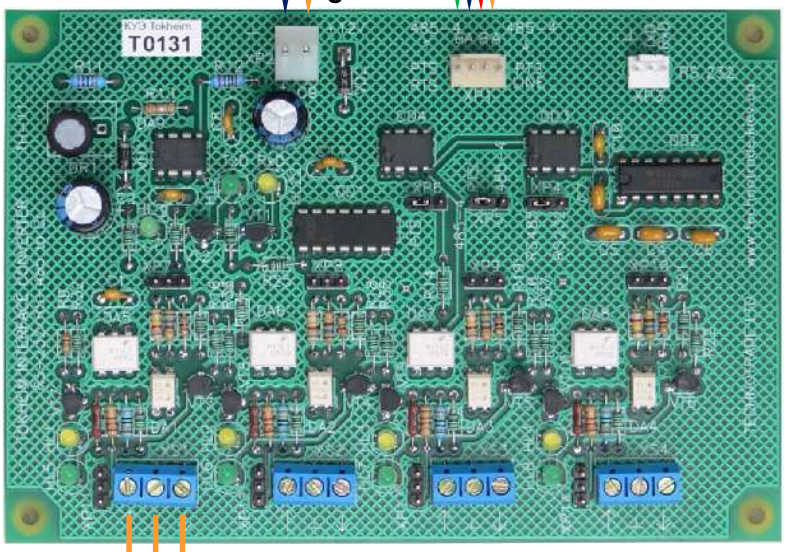
Configuration of PTS controller – protocol **TOKHEIM**, baud rate **9600**

Connection through pump channel 1 of PTS controller (example)



Pump port (XP2): pump channel 1 (RS-485)





Tokheim fuel dispenser interface converter (more info …)

Connection through first channel of Tokheim converter (example)

TTC
DCC
TTD

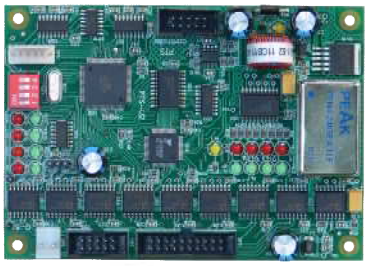
Tokheim dispenser board

NUOVO PIGNONE (MONO PRODUCT) DISPENSER CONNECTION SCHEME (RS-485)

Configuration of PTS controller:

- protocol **WAYNE Dart**, baud rate **9600**
- protocol **NUOVO PIGNONE CL**, baud rate **2400**

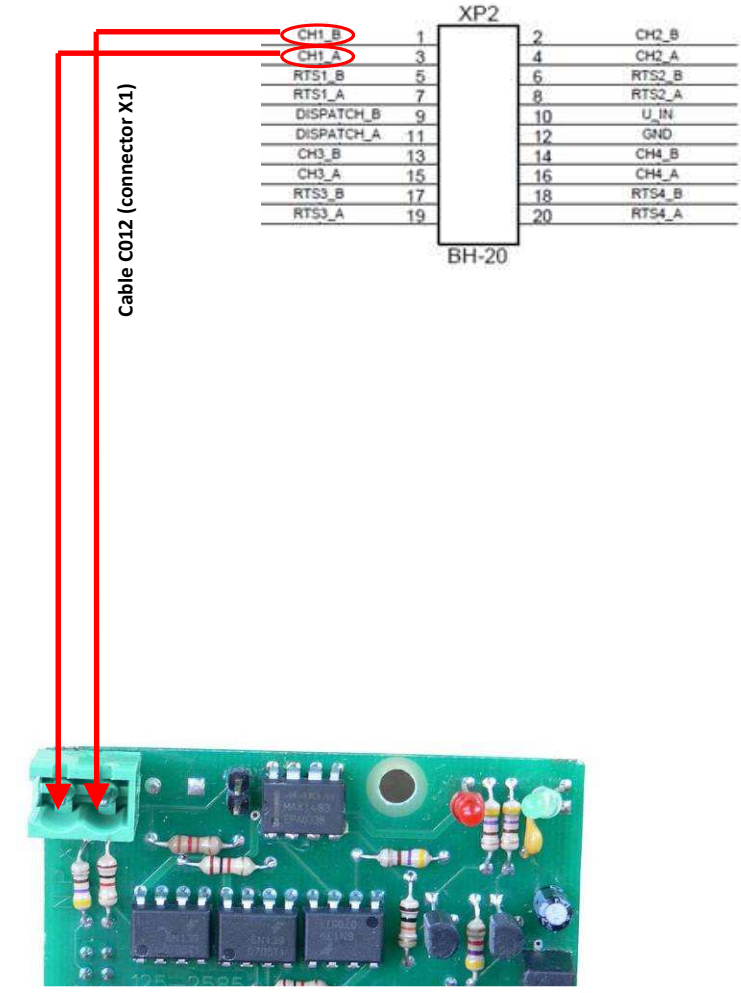
Connection through pump channel 1 of PTS controller (example)



Nuovo Pignone dispensers can be controlled using Wayne DART or Nuovo Pignone protocols. It depends on firmware of the Nuovo Pignone pumphead.

In order to connect PTS controller to Nuovo Pignone dispenser an interface converter board for RS-485 interface (for mono dispenser) is required to be installed in Nuovo Pignone dispenser.

Pump port (XP2): pump channel 1 (RS-485)



Nuovo Pignone dispenser interface board RS-485 (to be inserted into Nuovo Pignone motherboard in Serial port)

NUOVO PIGNONE (MULTI PRODUCT) DISPENSER CONNECTION SCHEME (RS-485)

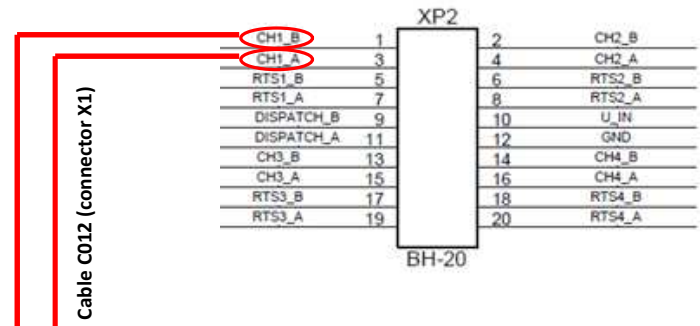
Configuration of PTS controller:
- protocol **WAYNE Dart**, baud rate **9600**
- protocol **NUOVO PIGNONE CL**, baud rate **2400**

Connection through pump channel 1 of PTS controller (example)

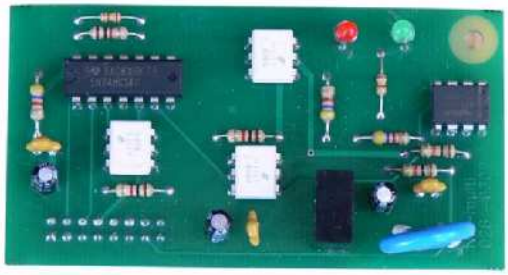
Nuovo Pignone dispensers can be controlled using Wayne DART or Nuovo Pignone protocols. It depends on firmware of the Nuovo Pignone pumphead.

In order to connect PTS controller to Nuovo Pignone dispenser an interface converter board for RS-485 interface (for mono dispenser) is required to be installed in Nuovo Pignone dispenser.

Pump port (XP2): pump channel 1 (RS-485)



Nuovo Pignone multiproduct dispenser motherboard external connector

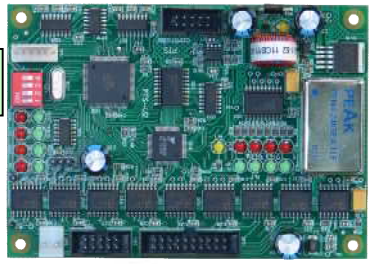


Nuovo Pignone dispenser interface board RS-485 (to be inserted into Nuovo Pignone motherboard in Serial port)

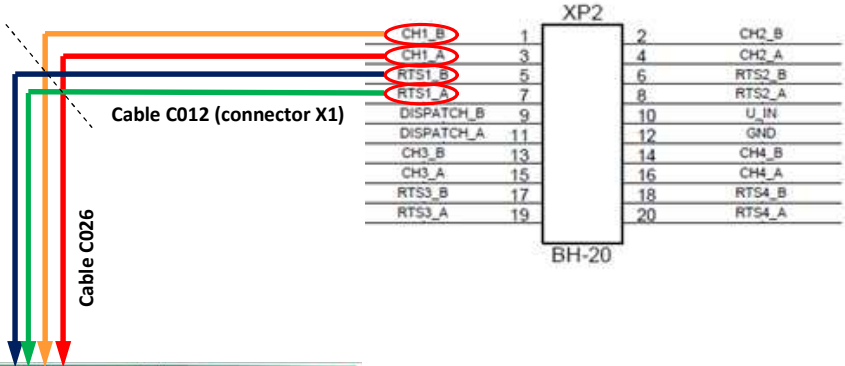
BATCHEN EMAIL DISPENSER CONNECTION SCHEME

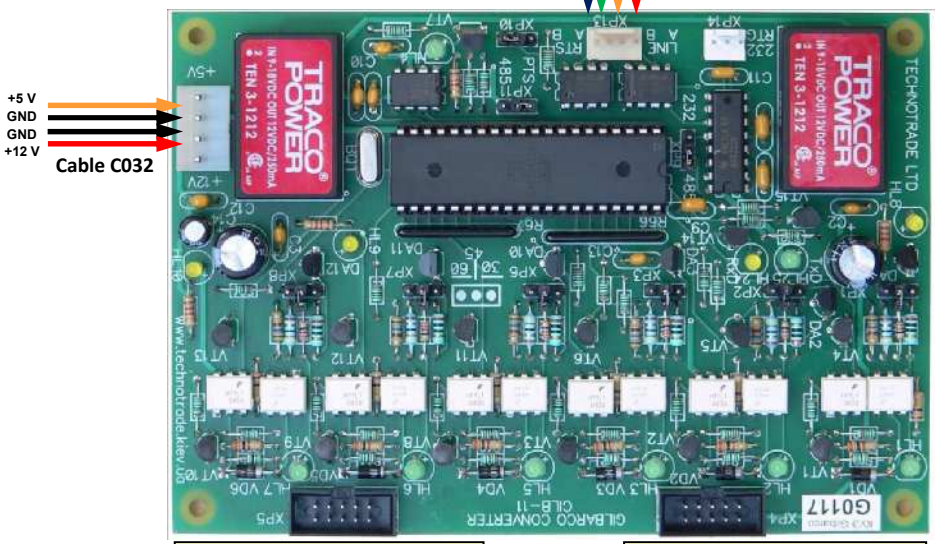
Configuration of PTS controller: protocol **BATCHEN Email**, baud rate **4800**

Connection through pump channel 1 of PTS controller (example)



Pump port (XP2): pump channel 1 (RS-485)

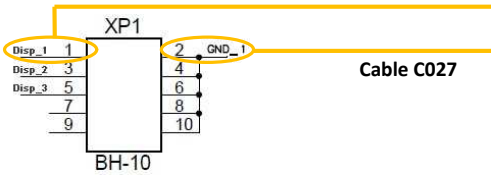




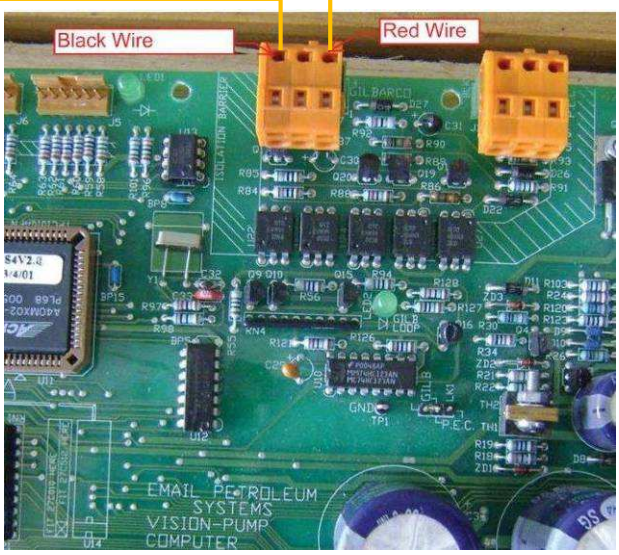
Gilbarco fuel dispenser interface converter (more info …)

Pump port (XP1): pump channels 1, 2, 3

Pump port (XP2): pump channels 4, 5, 6



Connection through first channel of Gilbarco converter (example)



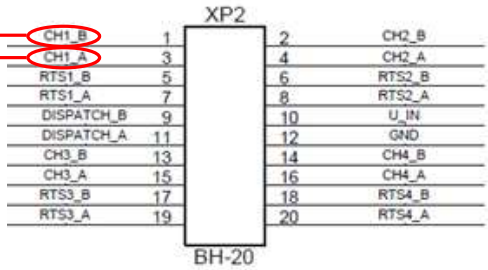
Batchen Email dispenser board

MEPSAN UNIMEP DISPENSER CONNECTION SCHEME

Configuration of PTS controller: protocol **WAYNE Dart**, baud rate **9600**

Connection through pump channel 1 of PTS controller (example)

Pump port (XP2): pump channel 1 (RS-485)



Cable C012 (connector X1)

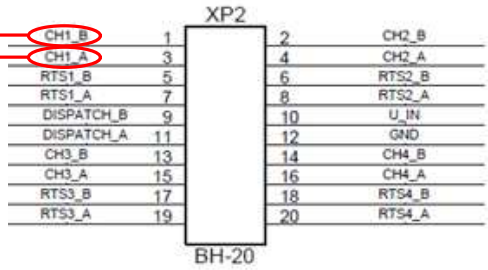
Mepsan Unimep dispenser calculator

MEKSAN / WAYNE SU86 DISPENSER CONNECTION SCHEME

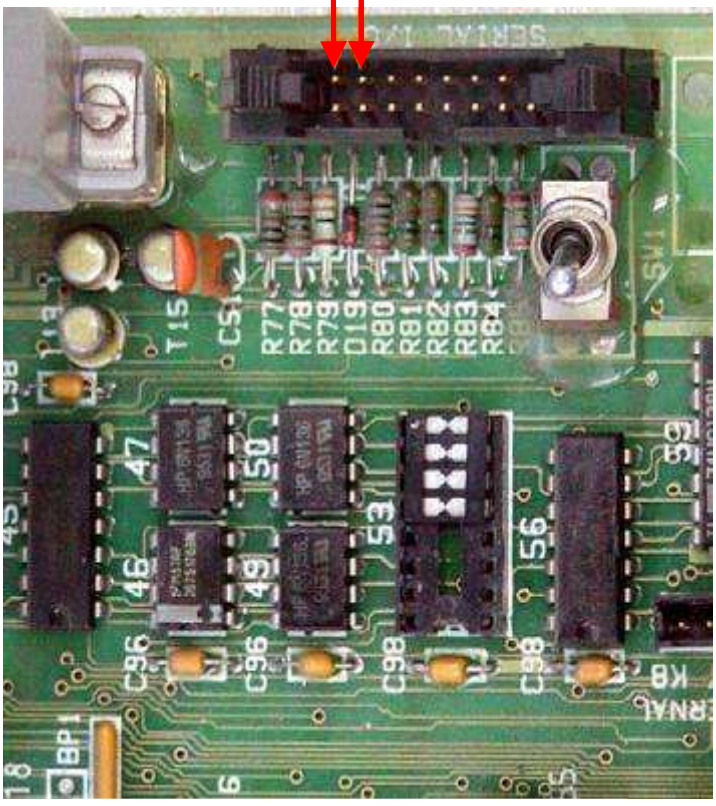
Configuration of PTS controller: protocol **WAYNE Dart**, baud rate **9600**

Connection through pump channel 1 of PTS controller (example)

Pump port (XP2): pump channel 1 (RS-485)



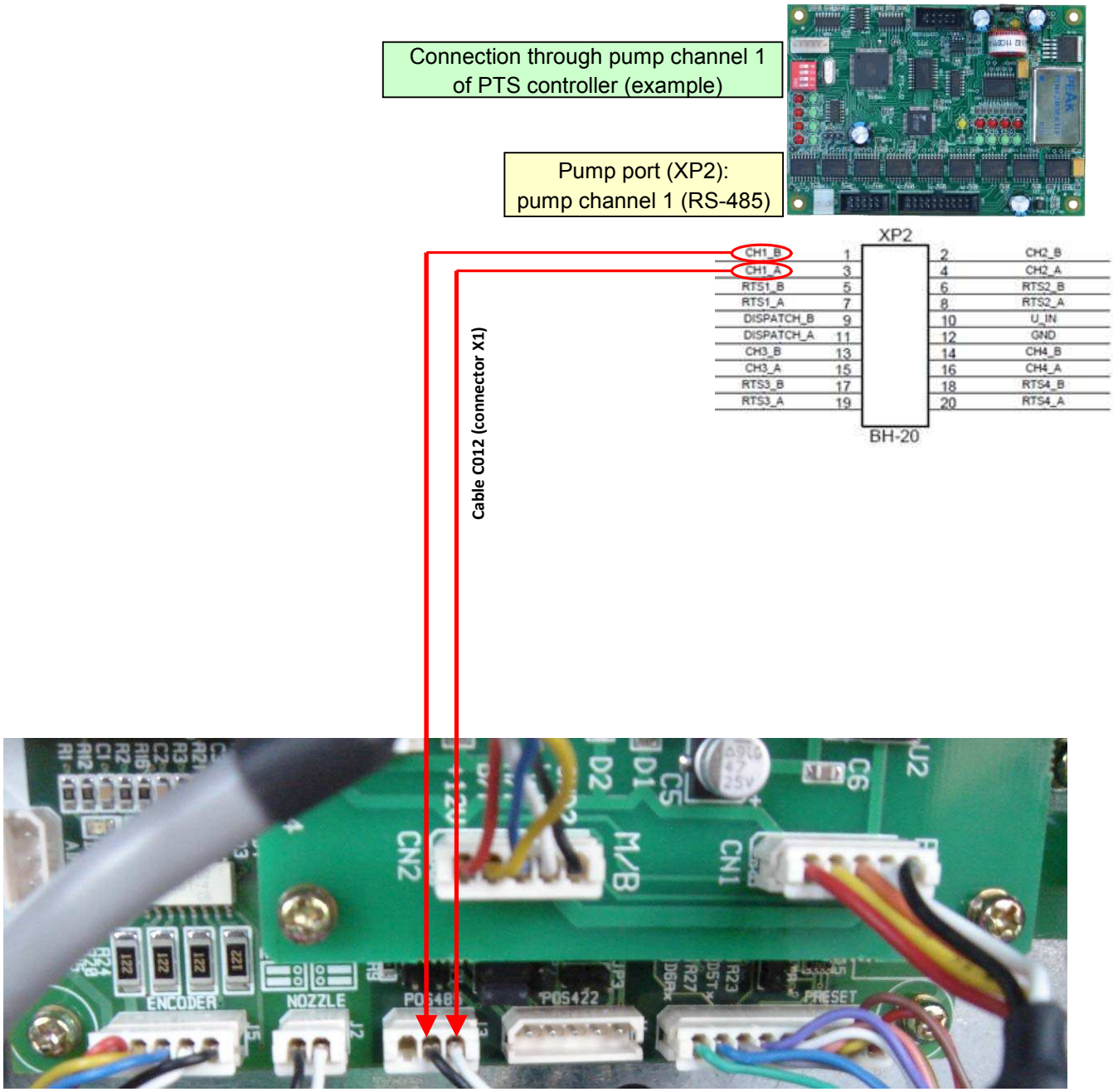
Cable C012 (connector X1)



MEKSAN / WAYNE SU86 dispenser board

KOREA EnE (LG EnE) DISPENSER CONNECTION SCHEME

Configuration of PTS controller: protocol **KOREA EnE**, baud rate **4800** or **9600**

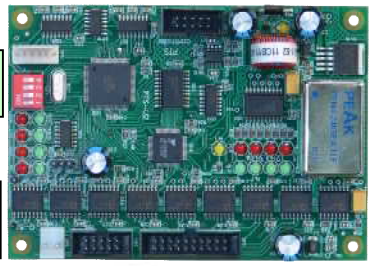


Korea EnE / LG EnE dispenser board

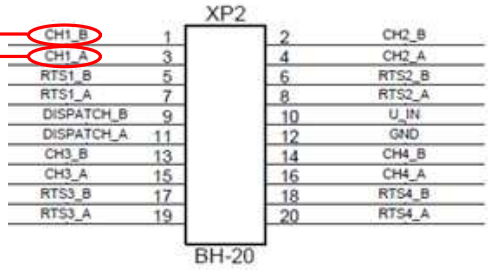
SAFE GRAF DISPENSER CONNECTION SCHEME

Configuration of PTS controller: protocol **SAFE Graf**, baud rate **9600**

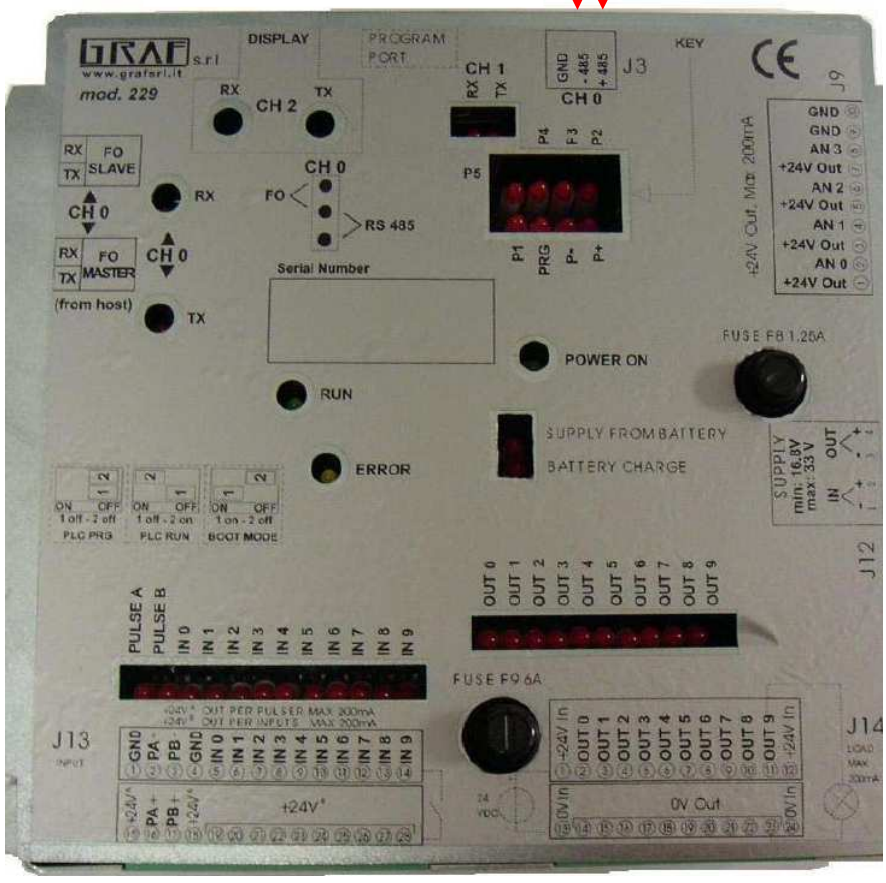
Connection through pump channel 1 of PTS controller (example)



Pump port (XP2): pump channel 1 (RS-485)

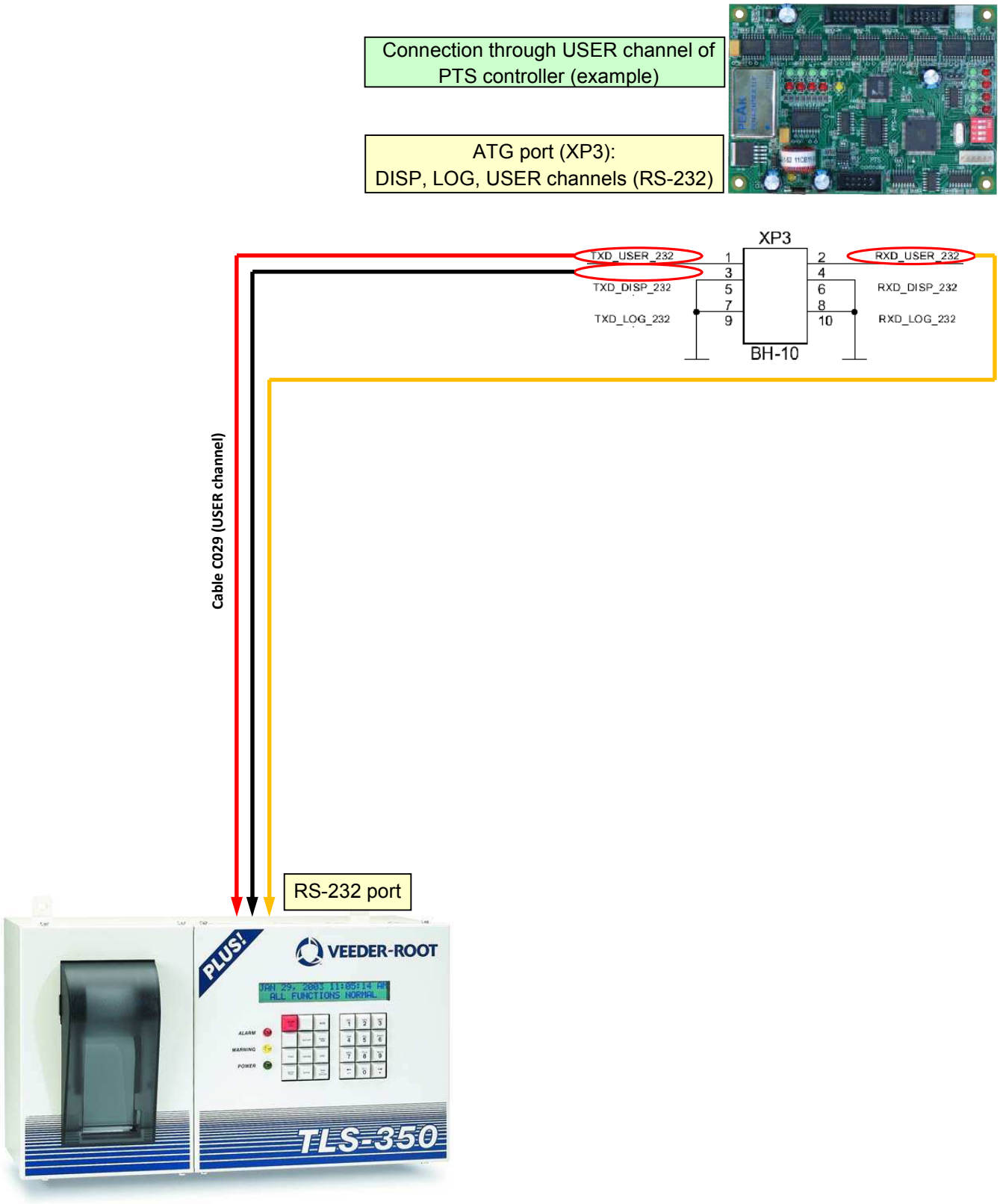


SAFE Graf electronic head PMII



ATG GILBARCO VEEDER ROOT TLS2, TLS-250, TLS-300, TLS-350, TLS-450 CONNECTION SCHEME

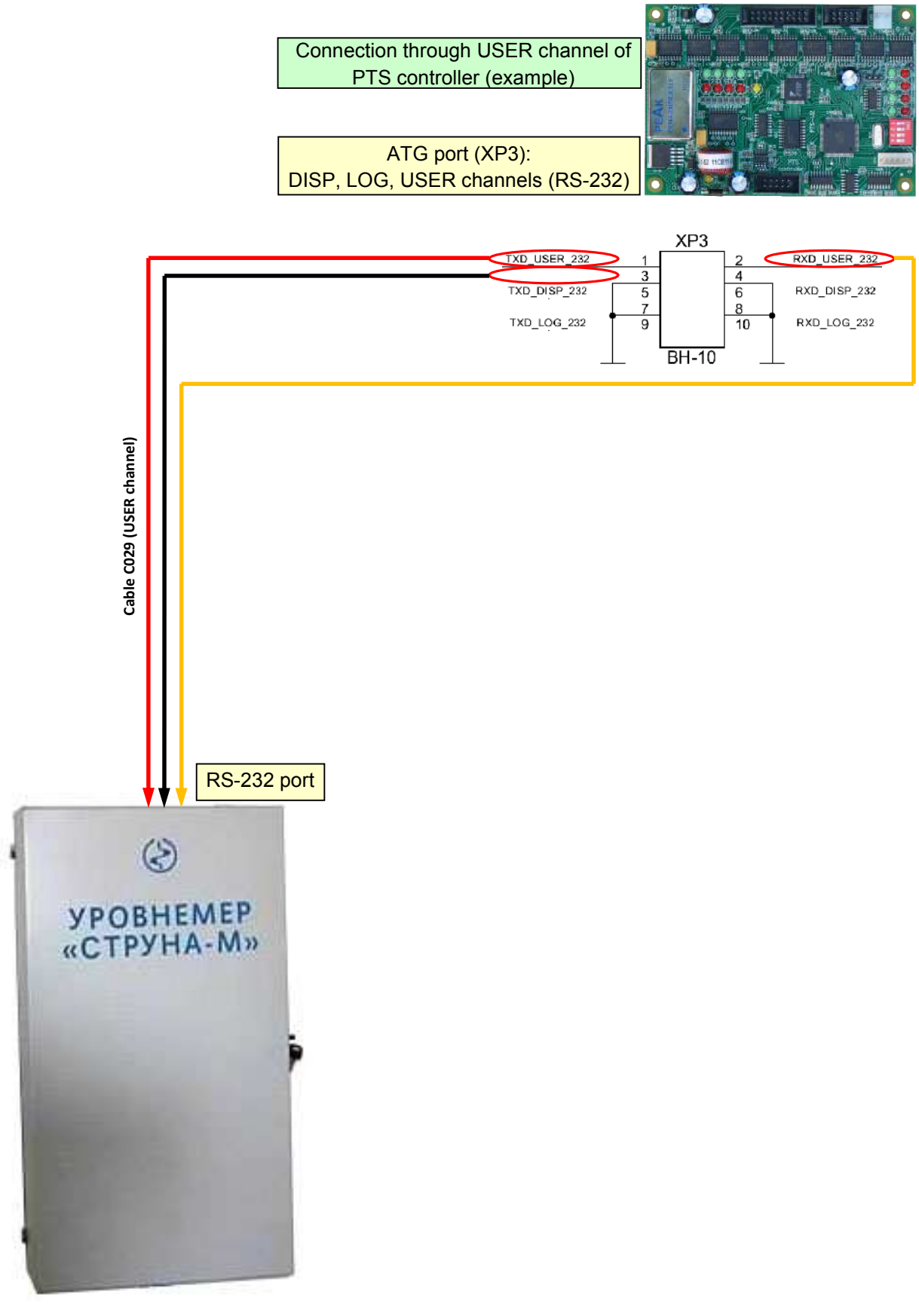
Configuration of PTS controller – protocol **GILBARCO Veeder Root**, baud rate is selected to be equal to set in TLS ATG system



Gilbarco Veeder Root TLS-350 ATG console

ATG STRUNA CONNECTION SCHEME

Configuration of PTS controller – protocol **STRUNA Kedr 1.4**, baud rate is selected to be equal to set in Struna ATG system



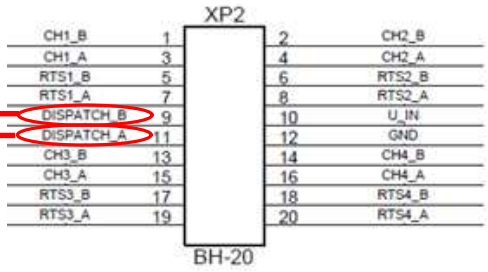
STRUNA ATG calculation unit

ATG START ITALIANA PROBES CONNECTION SCHEME

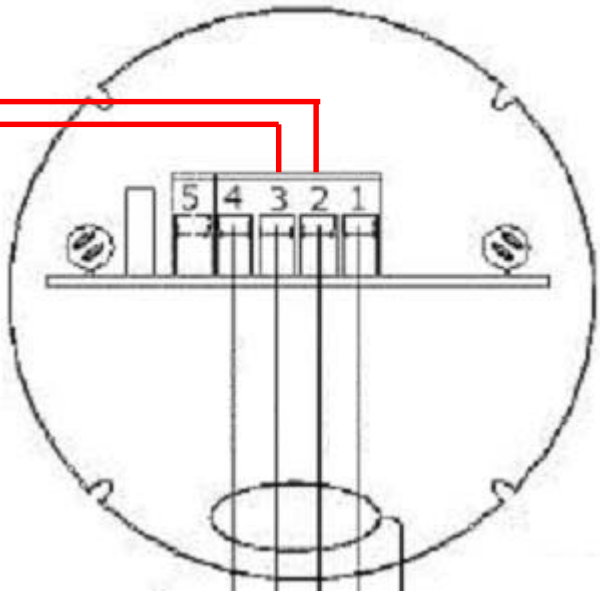
Configuration of PTS controller – protocol **START ITALIANA SMT-XMT**, baud rate **9600**

Connection through pump channel 1 of PTS controller (example)

Pump port (XP2): DISP channel (RS-485)



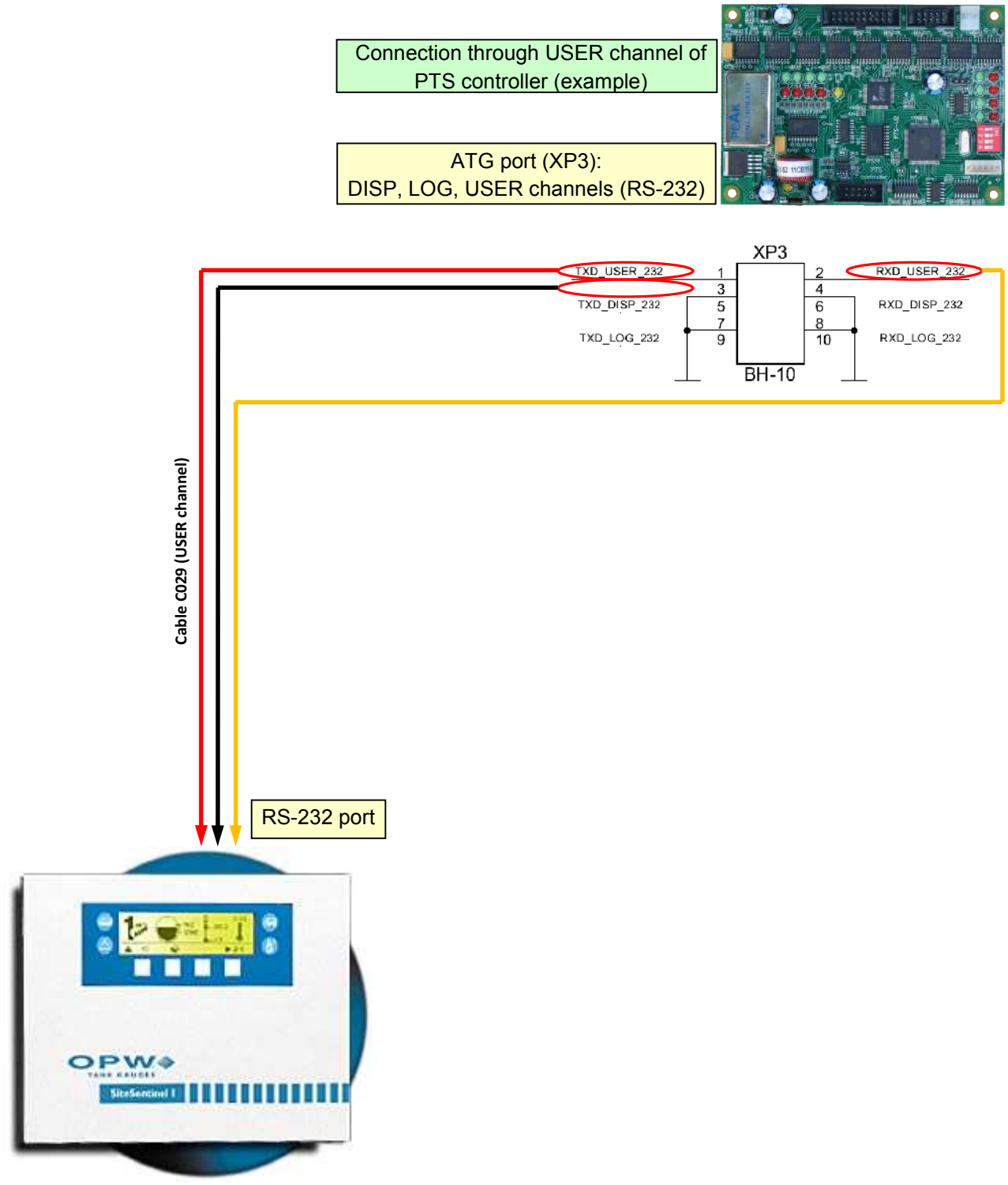
Cable C012 (channel DISP (RS-485))



Start Italiana probe (RS-485)

ATG PETRO VEND SITE SENTINEL CONNECTION SCHEME

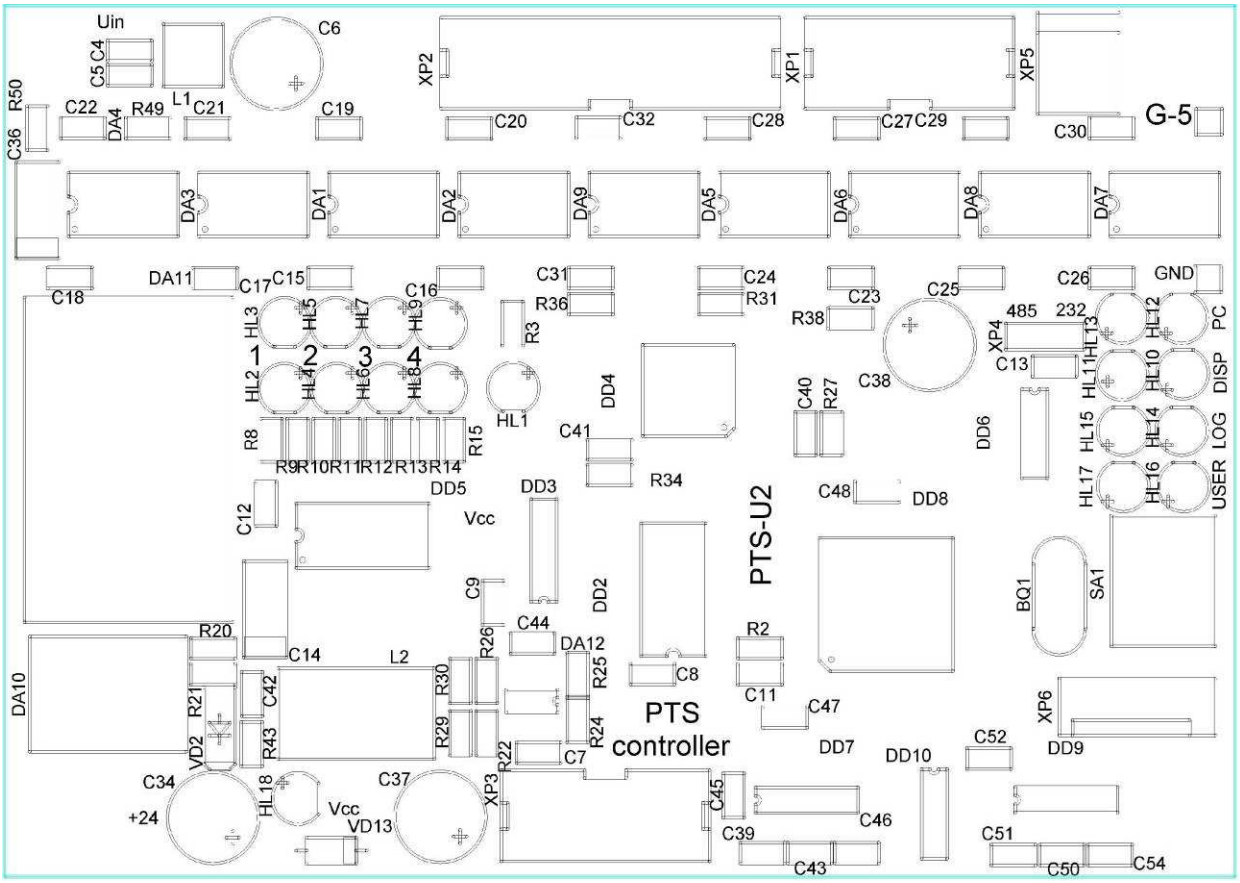
Configuration of PTS controller – protocol **PETROVEND 4**, baud rate is selected to be equal to set in Site Sentinel ATG system



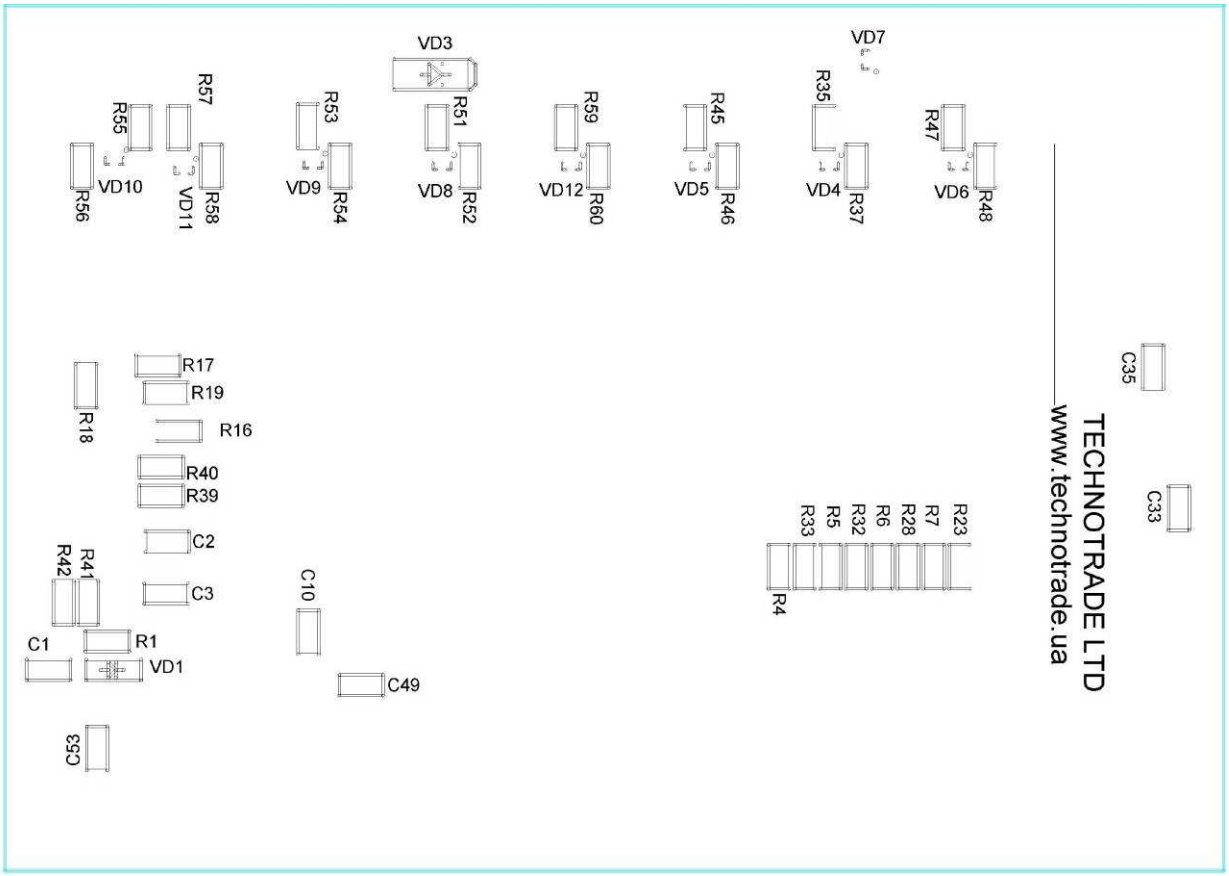
Petro Vend Site Sentinel ATG console

PTS CONTROLLER PCB BOARD

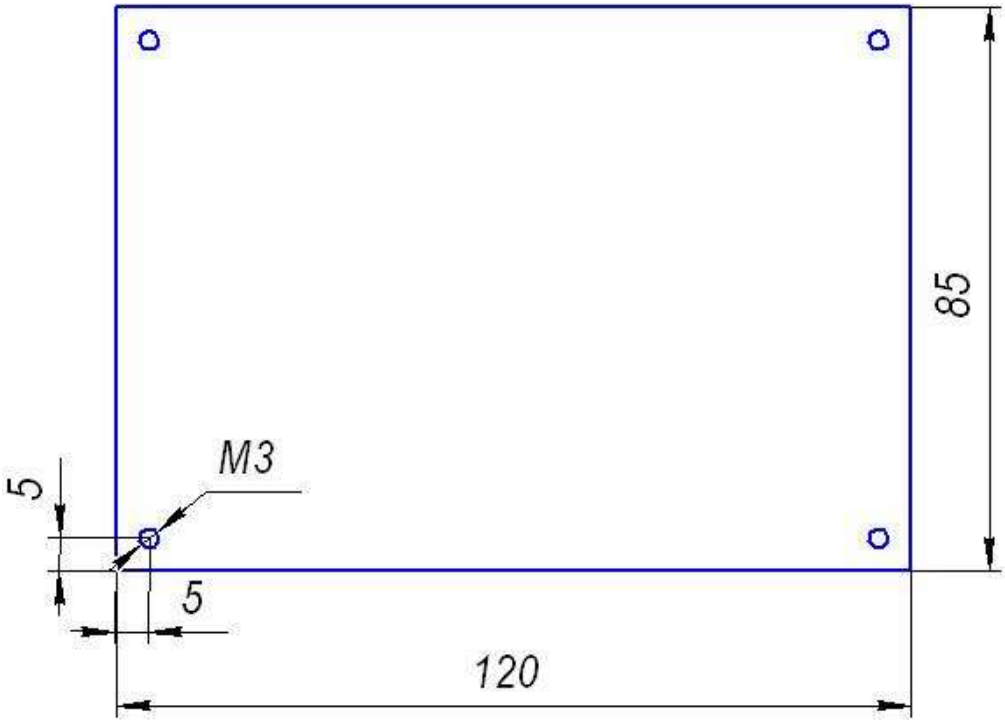
PCB board top view



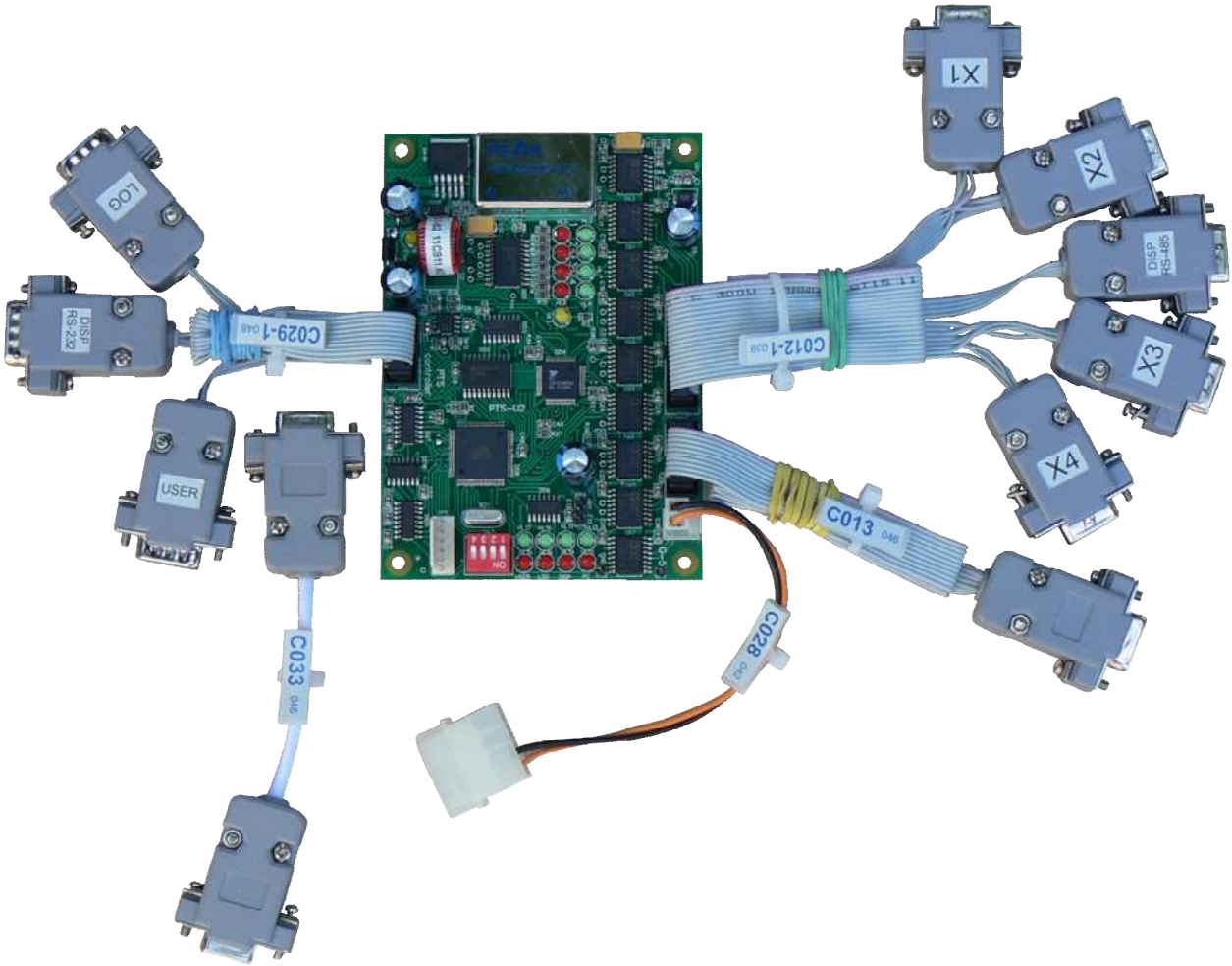
PCB board bottom view

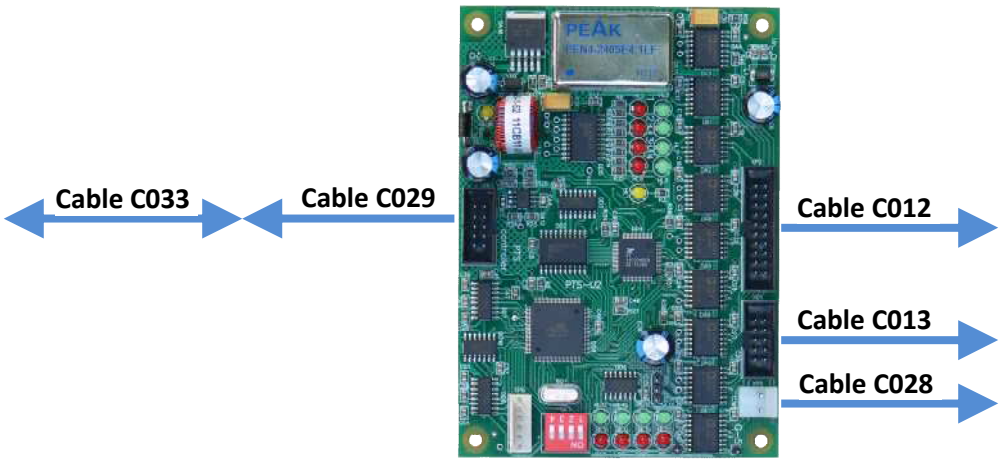


Dimensions

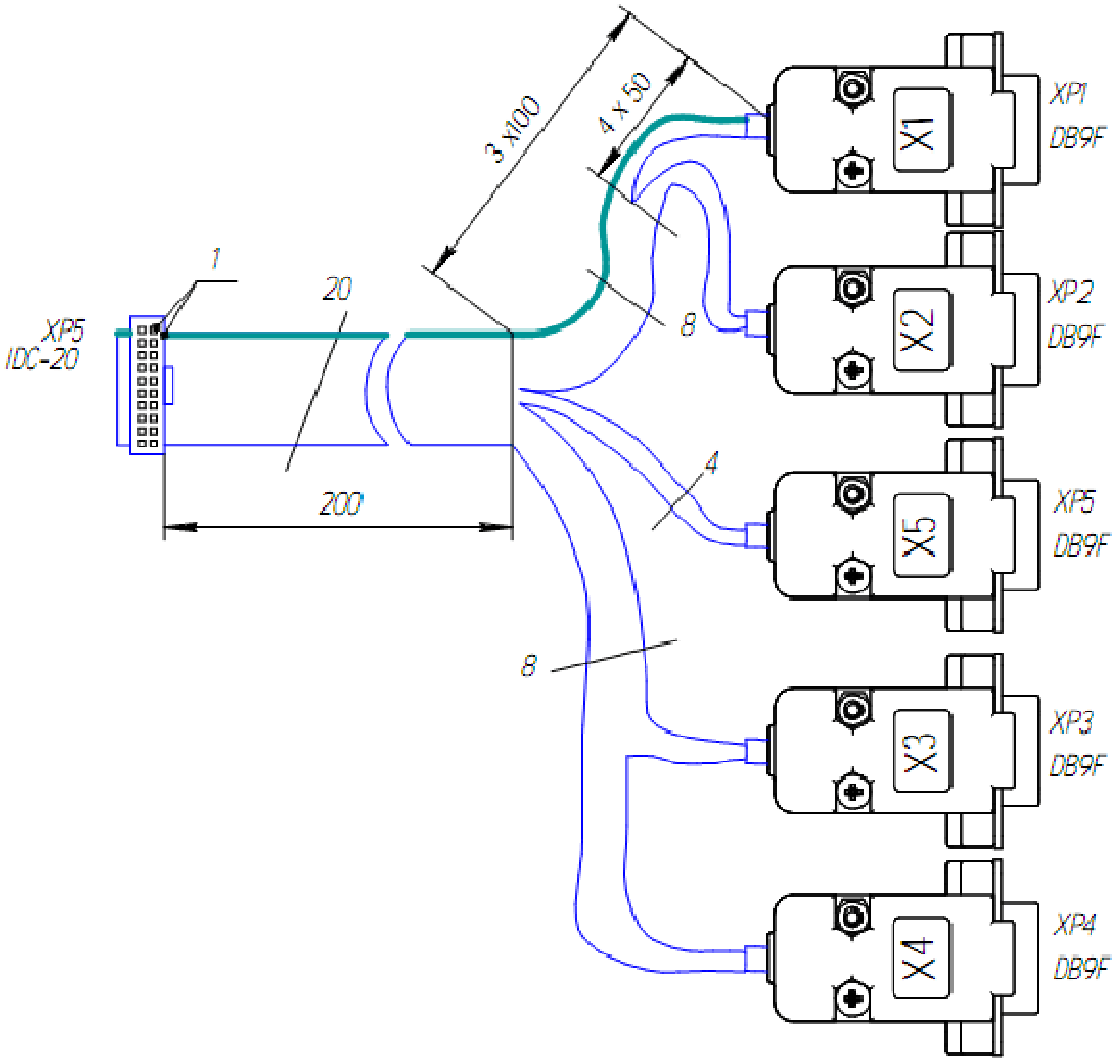


PTS CONTROLLER CABLINGS



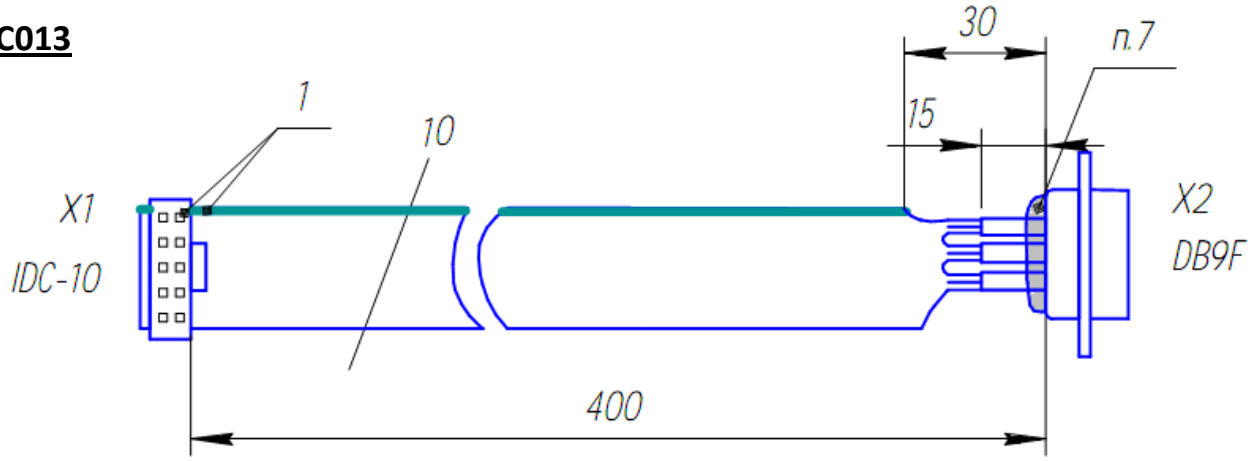


CABLE C012-1

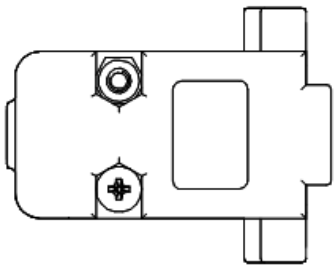


XP5	XP1
1	1
3	3
5	5
7	7
	XP2
2	1
4	3
6	5
8	7
	XP3
13	1
15	3
17	5
19	7
	XP4
14	1
16	3
18	5
20	7
	XP5
9	1
10	
11	3
12	

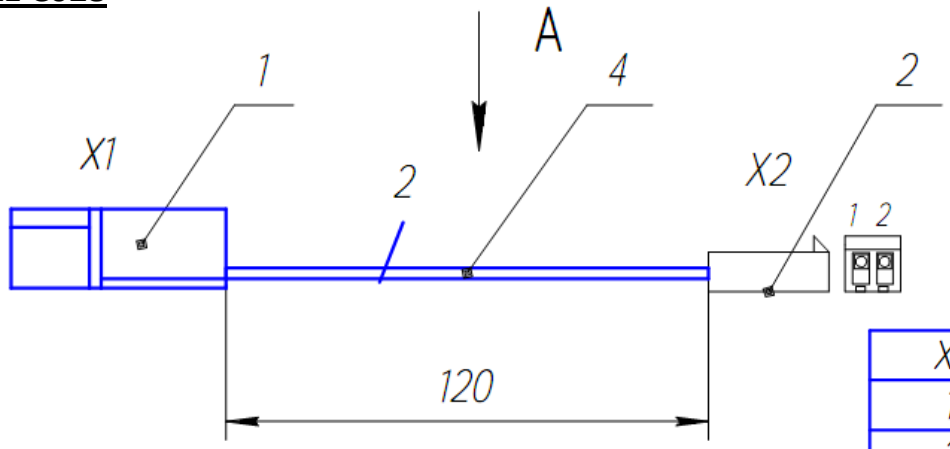
CABLE C013



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

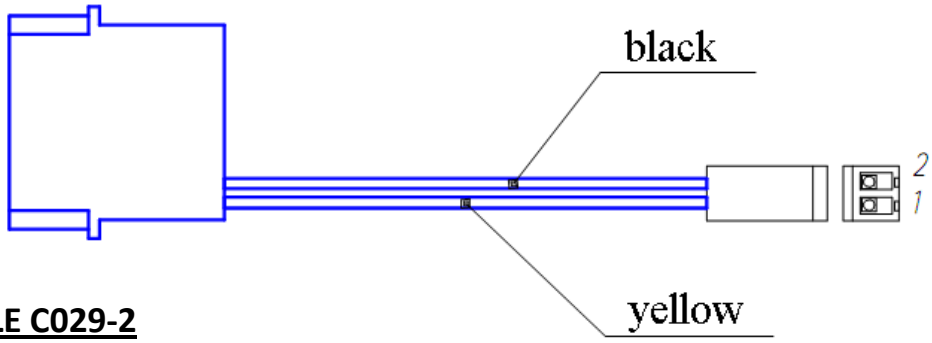


CABLE C028

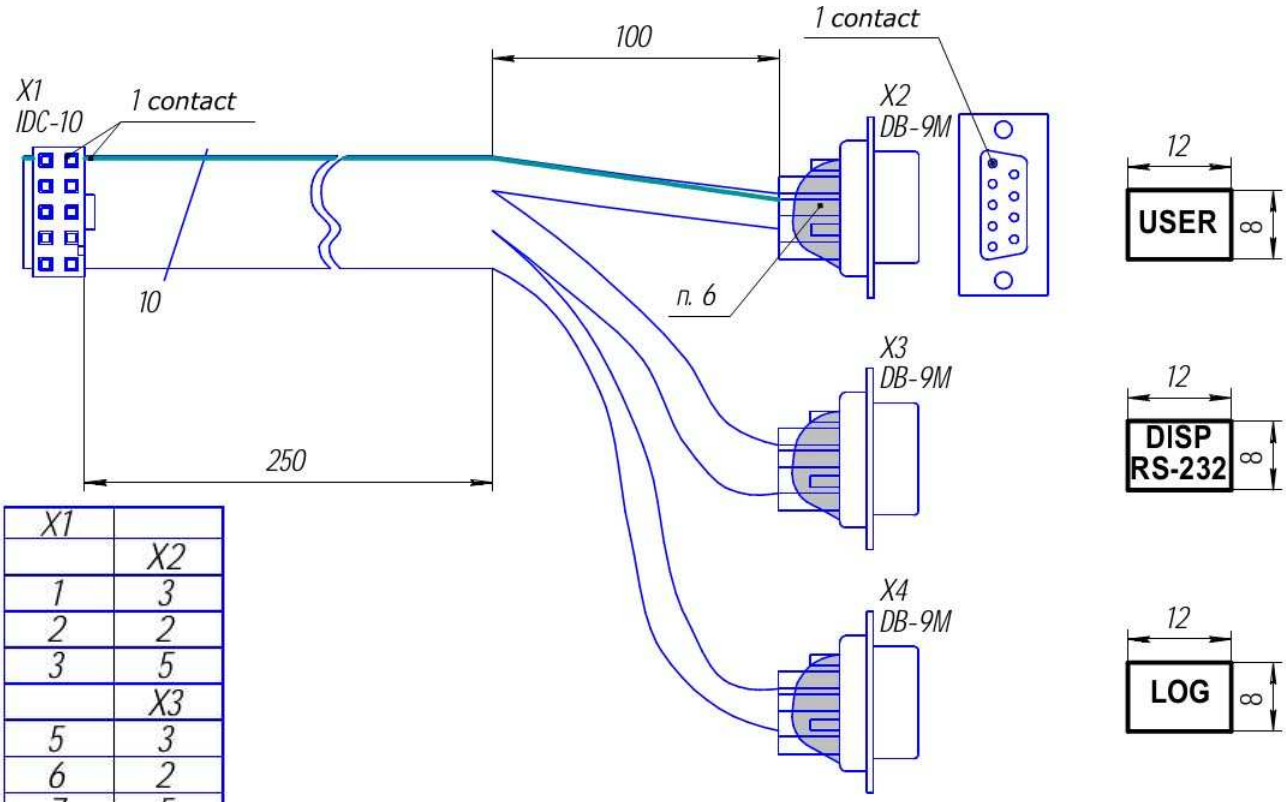


X1	X2
1	1
2	2
3	
4	

View A

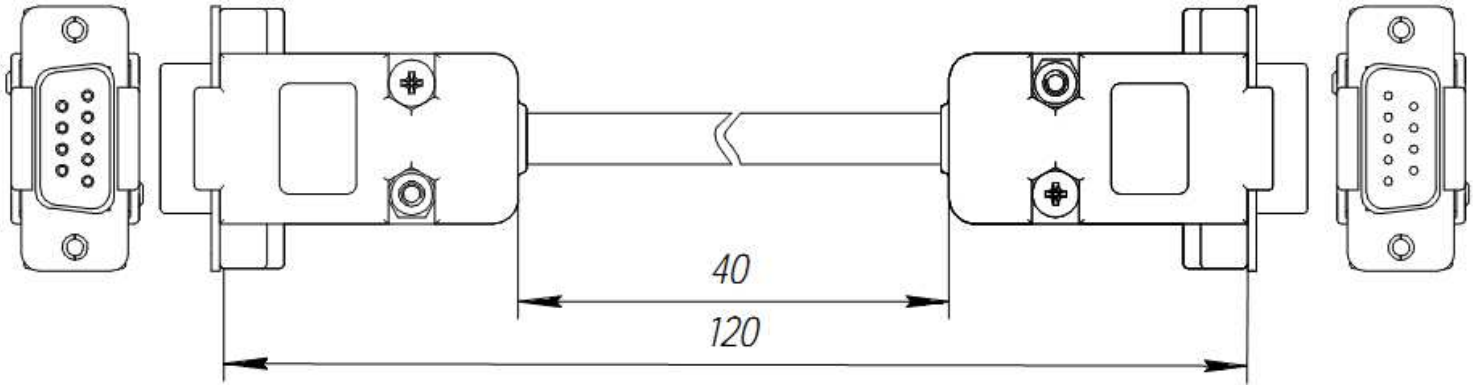


CABLE C029-2



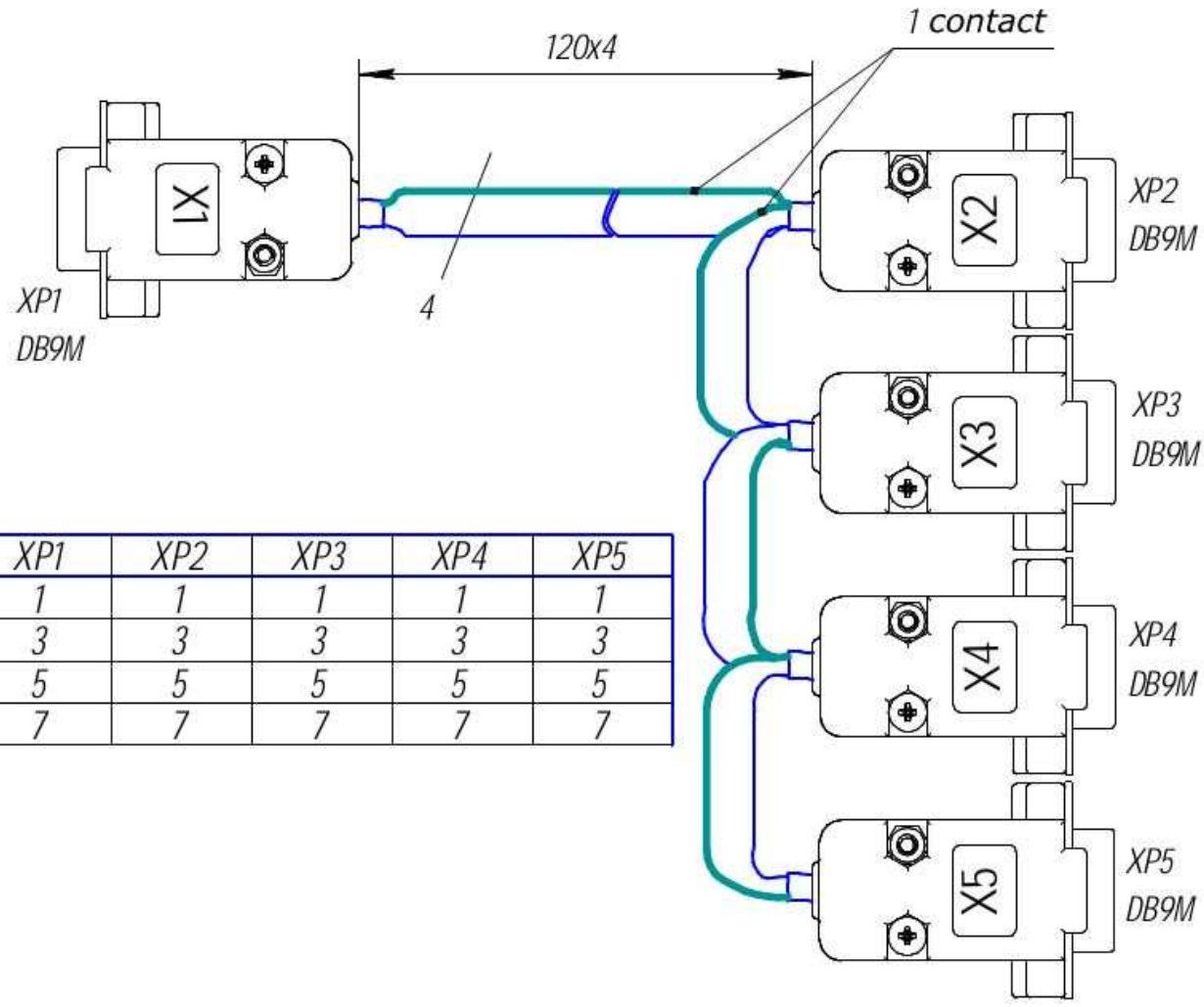
X1	
	X2
1	3
2	2
3	5
	X3
5	3
6	2
7	5
	X4
9	3
10	2
8	5

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