

Fuel dispenser module EFL-5.0

Passport and instructions
manual _

1.BASIC INFORMATION ABOUT THE PRODUCT AND

This passport and operating manual is intended to familiarize you with the technical data, device, technical operation and maintenance of the EFL-5.0 fuel dispenser module TU 28.13.11-002-00193312-2019 (hereinafter referred to as "TM"). Before you start using the TM, you should carefully read this manual. In case of non-compliance with the operating conditions of the device, measures must be taken to properly ensure the operating conditions in accordance with current regulations.

2. TECHNICAL SPECIFICATIONS

Name	Parameter
Overall dimensions: height/width/depth, mm	420×350×170
food, V.	220/24/12
Weight, no more than, kg.	9
Means of indication of fuel delivery	Seven-segment display, mechanical counter (option)
Operating temperature range, gr.	-40°C +50°C
Dose loading accuracy, l.	0.01
Maximum air humidity	85%
Connection to satellite monitoring systems.	GPS/GLONASS/GPRS
Fuel dispensing control	RFID plastic cards
Maximum power consumption, Watt	50

3. DEVICE AND PRINCIPLE OF OPERATION

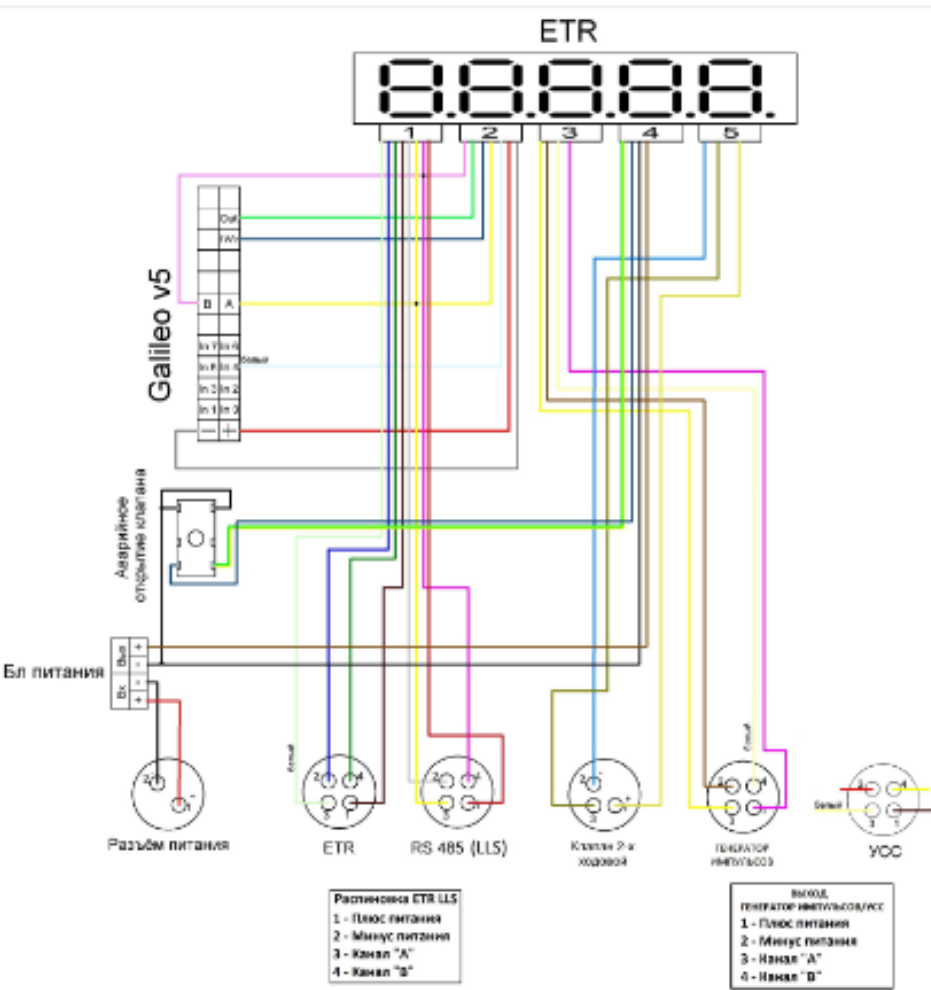
Fuel dispenser module EFL-5.0 is a system built on the basis of logic controller EFR-01. TM is intended for limited delivery of fuel. The amount of fuel is entered from the keyboard. TM has an LED display based on seven segment indicators for displaying parameters and emergency warnings, as well as LED indication of the device operation. Data on the dispensed fuel comes from fuel flow meters with a pulse output. The TM controls the solenoid valves and the pump motor. Fuel dispensing can be accessed using RFID cards.

Data about the card, the total counter and the value of the dispensed portion of fuel can be transmitted via the LLS(RS485) and Ibutton protocols .

FUEL DISPENSER MODULE EFL-5.0 (BYPASS MODE)

To unlock the valve or start the engine in case of failure of the electronics and organization of fuel delivery in forced bypass mode, it is necessary to remove the front panel (by unscrewing 8 screws), behind the front panel there is a toggle switch that must be switched to the “ ON ” position

FUEL DISPENSING UNIT EFL-5.0 PIN-OUT



10. TRANSPORT AND STORAGE

The product is transported in closed transport. Transportation conditions must comply with storage conditions 5 in accordance with GOST 15150-69.

Storage of products in packaging for transportation at the warehouse of the manufacturer and consumer must comply with storage conditions 3 in accordance with GOST 15150-69. The shelf life of products in packaging without re-preservation should be no more than 2 years from the date of manufacture. The storage room must be free of conductive dust, acid and alkali vapors, and gases that cause corrosion and destroy insulation.

11. PERSONS RESPONSIBLE FOR SAFE OPERATION AND PRODUCT IN GOOD CONDITION

spacer no.	FULL NAME. responsible for safe operation	Job title	Appointment date
1	2	3	4

12. DETAILS ABOUT COMPLAINTS

EXOTRON TECHNOLOGY LLC considers claims to the quality of the EFL-5.0 fuel dispenser module, provided that the consumer complies with the rules established by the operational documentation and in the presence of this passport. In case of loss of the passport, gratuitous repair or replacement of the failed product or its components is not performed and claims are not accepted.

In the event of a product failure in operation or finding out its malfunction during the warranty period, the consumer must send a malfunction report to the manufacturer's address with the following data: serial number, date of manufacture, nature of the malfunction or defect.

All complaints filed, their summary and measures taken must be recorded in the table below.

date	Summary of the complaint filed	Taken measures

on EFL-5.0

Nutrition	1. red + 2. black GND (negative)
-----------	-------------------------------------

Shut-off valve 1 (KS) - large stroke Shut-off valve 2 (KO) - low speed (starting the electric pump)	1. black 2. blue 3. yellow 4. brown
USS impulse sensor	1. pink (red) + Power (12 volts or 5 volts, jumper setting) 2. brown - GND 3. white - B 4. yellow - A
ETR - RS485 interface for connecting to a computer	1. plus power 2. power minus 3. channel "A" 4. channel "B"
Connecting the device	1. red + power 2. Black (Grey) - GND 3. yellow A RS485 (A) - information transfer to the meter tracker in the LLS protocol 4. pink in RS485 (B) 5. white - IMP_OUT - discrete normalized pulse output (100/10/1) 6. green - TR_EN - permission from the tracker; to connect to the OUT output of the GLONASS device. 7. blue - 1-wire - RFID tag in the IBUTTON protocol, for connecting to the terminal

Control and display elements

- 1 - button for emergency reset and shutdown of fuel delivery
- 2-6 - additional indication LEDs
- 7 - keyboard
- 8 - main indicator

Main menu

When the terminal is turned on, it is automatically set to the main menu.

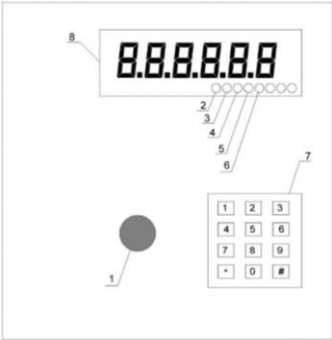
Pressing the number buttons will display the following options:

- 1-total counter XXXXXX.
- 2-last successful distribution XXXX.XX
- 3rd junior value of RFID card L XXXXX
- 4-highest RFID card value H XXXXX
- 5-real distribution value (used for tare and adjustment) XXXX.XX

To start entering the fuel dose value or to enter the settings menu, press "*".

Description of the states of the additional indication LEDs:

LED number	Color	Explanation
1	green	Fuel dispensing is allowed
	yellow	Issue on pause
	red	KRAN login error



Status of permission to dispense fuel		No permission from column
	blue	TR _ EN input error No permission from tracker
	purple (blue + red)	Error inputs KRAN and TR _ EN . No permission from column and tracker
	cyan (blue + green)	There is permission to issue fuel, but the tracker does not give permission. TR _ EN input error
	white (red + green + blue)	Pause due to empty fuel tank
2 RFID and master mode	green	The card is in the base of the terminal
	blue	The card is not in the base of the terminal
	red	Master mode (card or jumper)
	violet (red + blue)	The card is not in the base of the terminal in master mode
	yellow (red + green)	The card is in the terminal base in master mode
	does not shine	No map and no master mode
3 Valve condition	green	High flow valve - on Low flow valve - on
	yellow	High flow valve - off Low flow valve - on
	red	High flow valve - off Low flow valve - off
4 Phase counter A	green / off	Counter A forward input status
	red	Counter reverse
	blue	Counter is ignored
5 Phase counter B	green / off	Counter B forward input status
	red	Counter reverse
	blue	Counter is ignored
6 Reverse status from the tracker when identifying with only one card	green	The map is in the tracker database, and there is permission to issue fuel.
	blue	The map is not in the tracker database
	red	The card is in the tracker database, but it is blocked

7. SAFETY REQUIREMENTS

According to the method of protection against electric shock, the device corresponds to class I according to GOST 12.2.007.0-75.

Electrical installation work, connection to the mains and grounding (grounding) must be carried out by a qualified specialist in strict accordance with the "Rules for the technical operation of consumer electrical installations", "Safety regulations for the operation of consumer electrical installations" and "Rules for the installation of electrical installations", as well as the requirements of this document.

When working with the fuel transfer station, the operating personnel must comply with the safety requirements in accordance with GOST 12.3.019-80.

Persons who are familiar with this document and have permission to work with equipment under voltage up to 1000 V are allowed to operate.

Work with the fuel transfer station should be carried out only after it has been disconnected from the mains and measures have been taken to prevent its accidental activation.

After completion of commissioning and service work, all protective devices must be installed in their working position. The place where the fuel transfer station is connected to the electrical network must be protected from water ingress and isolated from direct access. The point of connection and use of the fuel transfer station must be protected from direct contact with moisture, dirt and sparks.

8. DISPOSAL INFORMATION

Full or partial disposal of components and materials that make up products is regulated by the legislation of the Russian Federation, which establishes the procedure for handling waste, hazardous waste, packaging materials and waste from packaging materials.

The provisions contained in it are fundamental principles and represent the rules that must be observed by all subjects of the Russian Federation.

There are no special requirements for application and/or disposal in terms of permissible chemical, radiation, thermal and biological effects on the environment. Additional safety measures for disposal are not required.

Disposal of products is carried out in accordance with the regulations of the country of the enterprise carrying out the operation.

9. DETAILS ABOUT COMPLAINTS

EXOTRON TECHNOLOGY LLC considers claims to the quality and completeness of the product, provided that the consumer complies with the rules established by the operational documentation and in the presence of this passport. In case of loss of the passport, gratuitous repair or replacement of failed equipment or its components is not carried out, and claims are not accepted.

In the event of a product failure in operation or finding out its malfunction during the warranty period, the consumer must send a malfunction report to the manufacturer's address with the following data: serial number, date of manufacture, nature of the malfunction or defect.

service .

The warranty period of operation is 12 (twelve) months from the date of commissioning, but not more than 18 months from the date of delivery of the equipment.

Warranties terminate:

- Out of Warranty;
- in case of loss (loss) of the passport;
- if the consumer does not comply with the conditions and rules for storage, transportation, installation and operation, established in the operation and installation manual of the unit.

The warranty does not cover:

- damage caused as a result of errors by operating personnel, use of unsuitable spare parts or other material mishandling;

- errors caused by equipment and/or parts that are not part of the supplied module;
- damage caused to someone else's equipment due to improper installation or operation of the supplied module;
- damage caused by independent changes to the design and technical documentation without prior consultation and agreement with the manufacturer.

Head of the organization:
M.P.

(personal signature) (signature transcript) (year, month, day)

6. CERTIFICATE OF ACCEPTANCE AND PACKAGING

FUEL DISPENSER MODULE

Fuel dispenser module EFL-5.0 _____
(model) (serial number)

Manufactured, accepted and packaged in accordance with the mandatory requirements of state standards, the current technical documentation.

Head of Quality Control Department
M.P.

(personal signature) (signature transcript) (year, month, day)

7 Reverse status from the tracker with double identification	red	The tracker sees only the label by iButton
	blue	The tracker sees only the entered PIN code
	Violet (red + blue)	The tracker sees the tag by iButton and PIN code, but fuel dispensing is prohibited
	green	Fuel distribution is allowed. The tracker sees the tag by iButton and PIN code
	white (red + green + blue)	The tracker sees the tag by iButton and PIN code, but this bundle is not in the database
8 Reverse status from tracker	blinking blue	PIN code entry
	blinking red	Dose administration
	green	Limit display before dose entry

Dose set entry menu

Number buttons 0-9 are used to enter the dose value, after that “#” is pressed to start dispensing fuel.

To start the “full tank” mode, immediately after entering the dose set menu, press “#”. The maximum value of liters in this mode is set by parameter "A5".

After pressing “#”, the terminal switches to the fuel dispensing mode.

To resume the delivery of fuel, previously set to pause, when entering the dose set menu, press the “0” key. After that, the pause value from the memory will be restored and the transition to the fuel delivery menu will take place. This will activate the pause. To continue dispensing fuel, you need to unpause with the "#" button.

To enter the settings menu, while in the dose set menu, simultaneously press keys 1 and 3.

Fuel dispensing can be carried out if there is permission - LED 1 should be green or blue.

Fuel dispense menu

The data is displayed in the following format XXXX.XX, where the dot is the separator of integers and hundredths of a liter.

When you press the "#" button while dispensing fuel, the fuel dispensing stops and pauses. At the same time, the dot of the last digit starts flashing, which is the pause indicator. When you press "#" again, fuel delivery is restored.

If a speaker or tracker error occurs, the terminal will automatically enter the pause mode.

To continue dispensing fuel, press the "#" button.

To cancel fuel dispensing and exit to the main menu, press "*".

If power is lost during the fuel dispensing, the terminal remembers the state before turning off and pauses. After the power supply is restored, fuel withdrawal can be continued (see the menu item for entering a dose set).

Settings menu

To enter the settings menu, while in the dose set menu, simultaneously press keys 1 and 3. After that, the inscription “PAR A” will be displayed for a short time, which will indicate the transition to the parameters of group “A”.

To be able to change the parameters, the master mode must be activated (LED 2 must be red).

Key assignment:

- 1 - group A (values 0-65000)
 - 2 - group B (values 0-255)
 - 3 - group C (values 0-1)
 - 4 - parameter number -
 - 6 - parameter number +
 - 7 - parameter value -
 - 9 - parameter value +
 - 0 - set the default value
 - * - exit to the main menu
- When switching between parameter groups, it will display "PAR X", where X is the group type.

Group A parameters

Parameter	Description	Default value
A 1	Number of pulses per 40 liters	4000
A 2	Dose overflow compensation. The distribution stops for the specified number of tens of milliliters, thereby compensating for the overflow. 1 unit = 10 ml.	0

A 3	Dose compensation. The portion is increased by a given number of tens of milliliters. 1 unit = 10 ml.	0
A 4	1ED=10ML	50
A 5	The number of liters that can be dispensed in the "full tank" mode. Also, this value is the maximum for fuel delivery. 1 unit = 1l	10000
A 6	maximum value of the FLS during calibration. When this value is reached, the calibration stops.	4095
A 7	The value of the fuel intake capacity 1 unit \u003d 1l	190
A 8	ID (used for ETR control)	0
A 9	View firmware version. For example 127 is version 1.27	
A 10	Password	0
A 11	Fuel price in kopecks.	0
A 12	Service number	0

B parameters

Parameter	Description	Default value
B1 _	Counter sensor type 0-USS 1-GERKON 2-DO10 3- EX	0
B2 _	Pulse waiting time, sec	5
B3 _	Value of one output pulse 0-1L 1-0.1L 2-0.01L	1
B4 _	Output pulse duration *0.2ms	20
B5 _	LLS RFID Address	4
B6 _	Total meter LLS address	5
B7 _	LLS address value of successfully distributed distribution	10
B8 _	LLS FLS address " A ". Used for tare.	0

The spilled value will be different from the dose that was administered. We calculate the difference between the given portion and the final value. Next, we make this difference in parameter A2, if there was an overflow (A3 should be equal to zero). If there was underfilling - in parameter A3 (A2 should be equal to zero).

One unit of parameters A2, A3 is equal to 10 ml.

Example 1: set 5 liters. As a result, we received 5.23 liters. Brought into parameters A2= 23, A3=0.

Example 2: set 5 liters. As a result, we received 4.86 liters. Entered into parameters A2=0, A3=14.

When one parameter is configured, the second one must be equal to zero.

These are preliminary values for these parameters. It is advisable to make several spills and select the value of these parameters so that the result is as close as possible to the dose being set.

Fine adjustment of aspect ratio.

After we have already set the overflow / underfilling, we fine-tune parameter A1 to the “zero” level on the dipstick.

Program update.

The software update should not be carried out if the fuel dispenser is functioning correctly. To update the software, you need to connect the USB-RS485 converter to the ETR RS485. The program for the computer is the same as for calibration.

<http://www.der-hammer.info/terminal/hterm.zip> - direct download link.

At the same time, it is necessary to launch the COM port terminal program on the computer. Next, specify the number of the emulated COM port in the program and connect it. The data transfer rate is 19200 8bit.

Next, we transfer the fuel dispenser to the software update mode. To do this, parameter A10 must be set to the password - 8934.

After setting the password, we activate the exit to the software update mode using the “C 16” parameter. After that, Prg000 will be displayed.

Next, click the " Send " button. file" in the program, specify the file itself and confirm the sending of the data.

After the start of sending the firmware file, the number of received blocks will increase. Upon successful completion of the software update, all dots near the numbers will be included.

If an error occurs during the download process, the PrgErr message will be displayed .

4. COMPLETENESS

The basic package should include:

- fuel dispenser module EFL-5.0;
- operation manual - passport;

5. MANUFACTURER WARRANTY

EXOTRON TECHNOLOGY LLC guarantees the compliance of the fuel dispenser EFL-5.0 with the requirements of the set of design and technological documentation of the manufacturer and regulatory and technical documentation.

EXOTRON TECHNOLOGY LLC guarantees reliable and trouble-free operation of TM, provided that the consumer complies with the rules for transportation, storage and operation established by the instructions for installation, operation and technical

To cancel fuel dispensing and exit to the main menu, press "*".

If power is lost during the fuel dispensing, the terminal remembers the state before turning off and pauses. After the power supply is restored, fuel withdrawal can be continued (see menu item start calibration).

The displayed fuel counter for each portion is not reset, but summed up to the previous portions. Valve shutdown control is also carried out based on the readings of this counter. Thus, the absolute error of overfilling / underfilling of a portion will not accumulate throughout the entire calibration. This allows you to level the value of the absolute error during calibration.

During calibration, the same mechanism of reaction to pauses operates as in the case of standard fuel dispensing.

For pouring large quantities of fuel, it is most convenient to use the values of a portion of 200 liters and a settling time of 10 seconds.

Receiving calibration data

To receive calibration data, you must connect the USB-RS485 converter to the ETR RS485. At the same time, it is necessary to launch the COM port terminal program on the computer. Next, specify the number of the emulated COM port in the program and connect it. The data transfer rate is 19200 8bit. After that, you need to start the action with parameter C5 for FLS "A", C6 - "B", C7 - "C" and C8 - "D". After setting, the value will automatically be set to "0".

Upon completion of the transfer - must be saved in ASCII format.

The data has the following format: XXX: VVV; XXX: VVV; XXX: VVV;

Where XXX is the value of the FLS and VVV is the value of liters.

<http://www.der-hammer.info/terminal/hterm.zip> - direct download link

Automatic calibration of readings

Various combinations of installed equipment can affect the accuracy of the dosage of fuel portions.

The terminal has 3 main parameters that affect the accuracy: A1, A2, A3. For full adjustment, a specialized accurate measuring container is required, preferably with a skimmer.

The terminal has an auto-calibration of overfill/underfill.

To activate it, you must set the parameter (action) C9. After that, make a set of a single dose. After its completion, 10 seconds pass and the portion is repeated. 3 repetitions will be made. After analyzing the discrepancies in the readings, the parameters A2, A3 will be changed. After auto-calibration, C9 is reset to 0 and then the terminal works in normal mode.

If necessary, you can manually adjust the parameters A2, A3.

The following will describe the fine calibration process using a 10 liter measuring cup as an example.

Preset aspect ratio

Initially, you need to configure the parameters A2, A3, which are responsible for overfilling or underfilling. To do this, a test portion of approximately 2-5 liters is spilled. The size of the portion depends on the performance of the dispenser pump.

To display the real value of the dose, the parameter C19 must be equal to 1, or after completing the portion, press "5".

B9 _	LLS FLS address " B ". Used for tare.	1
B10 _	LLS FLS address " C ". Used for tare.	2
B 11	LLS FLS address " D ". Used for tare.	3
B12 _	Time between two straits during calibration, sec	40
B 13	Portion size when tare. 1 unit = 1l	10
B 14	The number of the FLS by which the end of the tank is controlled. 0-without control according to the indications of FLS 1- FLS " A " 2- FLS " B " 3- FLS " C " 4- FLS " D " 5-All FLS . Calibration will stop if at least one FLS exceeds the set value.	0
B15 _	Waiting time for the last impulses of the counter, sec. This parameter is needed in cases of possible false pulses of the counter, when the distribution of fuel has already been completed. Value 0 - the counter will always be active.	0
B 16	Display type of fuel dispensing value 0 - XXXX . XX 1- XXXXX . X 2 -XXXXXXX . 1 and 2 has rounding.	0
B17 __	Fuel dispensing start timer. This is the valve activation delay after fuel dispensing has started. A value of zero means no delay. The unit of measurement is seconds.	0
B18	ETR control 0-disabled, 1-enabled	0

B 19	Address of the fuel dispenser when controlled by ETR	0
B20 _	ETR line speed 0-2400, 1-4800, 2-9600, 3-19200, 4-38400, 5-57600, 6-115200	3
B21 _	LLS address for the identifier entered from the keyboard. 0-254 - address, 255 - prohibition.	255
B22 _	LLS address of additional parameter 1. 0-254 - address, 255 - prohibition.	5
B23 _	LLS address of additional parameter 2. 0-254 - address, 255 - prohibition.	6
B24 _	LLS address of additional parameter 3. 0-254 - address, 255 - prohibition.	7
B25 _	LLS address of additional parameter 4. 0-254 – address, 255 – prohibition.	8
B26 __	Service parameter for ignoring the prohibition of fuel delivery. +1 - ignore the identifier entered from the keyboard +2 - ignoring permission from the tracker - TR _ EN +4 - ignoring permission from the gun - KRAN _ EN +8 - must be set when the limit algorithm is running Easy logic	1

B27 _	TOTAL output mode COUNT 0- Working with an external price indicator. 1- Work on an external electromagnetic meter	0
B28 _	Filtering TR _ EN and KRAN inputs . Reaction time = 7sec/ B 28.	50

C parameters

Parameter	Description
C1 _	1-Mode add cards
C2 _	1-Master card setting mode
C3 _	1-Card Delete Mode
C4 _	1-delete all cards. Parameter A10 must be set to prevent accidental pressing - 6755
C5 _	1-Sending the text of the calibration of the FLS " A " via the ETR channel RS 485
C6 _	1-Sending the text of the calibration of the FLS " B " via the ETR channel RS 485
C7 _	1-Sending the text of the calibration of the FLS " C " via the ETR channel RS 485
C 8	1-Sending the text of the calibration of the FLS " D " via the ETR channel RS 485
C9 _	1-Enable auto calibration overflow/underflow
C 10	
C 11	

C 12	
C 13	
C 14	
C 15	
C 16	Launching a terminal program update. Parameter A10 must be set to prevent accidental pressing - 8934
C 17	1 - tare mode 0 - standard mode
C 18	1-Permission of distribution if the card is in the database. Autonomous mode - Fuel dispensing is allowed if there is permission either from the tracker or from the card that is in the base of the device. 0 - the map does not affect the fuel dispensing permission.
C 19	1-Display the actual serving value at the end of the distribution. 0-display the planned portion value.
C 20	1-all cards will be perceived as being in the base

Parameters C 1-16 are not remembered, they are used to trigger actions. The default is 0, which means it is inactive. When the action is started, it can be set to state 1 for some time, that is, the active mode.

Parameters C 17-32 are parameters that are memorized.

When cards are added, LED 2 will change its color to yellow (red + green), and when removed it will turn purple (red + blue).

To change parameters and add/remove cards, you must be in master mode.

Master mode is activated if a master card is installed. Master mode continues for another 30 seconds after the master card is removed. Master mode will always be active without cards if jumper J1 is installed (see appendix 2).

Calibration

To activate this mode, you must set the parameter "C17" to position "1".

In this mode, fuel is dispensed in portions, and with a certain frequency. There is time between shots for the fuel to settle down. At the end of each pause between portions, readings from the FLS are recorded . The number of available FLS 1-4 are denoted by the letters "A", "B", "C" and "D", respectively.

During the calibration process, it is possible to change the portion size and the settling time on the fly.

Calibration start menu

To transfer the terminal to the calibration mode, it is necessary to set the parameter "C17" to the state "1".

To start calibration, you need to press the “*” key while in the main menu. After that, the terminal will switch to the first calibration start mode.

The data is displayed in the following format: TTT.XXX. Where TTT is the settling time between bursts (sec) and XXX is the burst size. The starting values for these calibration parameters are taken from parameters B 12 and B 13 respectively. You can change these values before starting.

Calibration menu

Key assignment:

1- current values of LLS “D” DXXXXXX

2- current values of LLS "A" XXXXX

3-display of tare parameters TTT.XXX (settling time and portion size)

4-decrease settling time TTT.XXX

5- current values of LLS “B” BXXXXXX

6-increase settling time TTT.XXX

7-reducing the size of the portion of fuel TTT.XXX

8- current values of FLS "C" CXXXXX

9-increase the size of the portion of fuel TTT.XXX

0-resume tare (similar to standard mode)

"*" - return to the main menu

"#" - start calibration

1+3 - go to the menu for changing the main parameters (similar to the standard mode)

If the fuel intake capacity runs out, a pause will occur and LED 1 will light up white (permission status). To view the balance in this tank, press the "3" key. The value of this capacitance is set in parameter A 7.

If at least one FLS has a value higher than parameter A 6, then the calibration will be stopped at the end of the fuel calming pause.

When you press the "#" button while dispensing fuel, the fuel dispensing stops and pauses. At the same time, the dot of the last digit starts flashing, which is the pause indicator. When you press "#" again, fuel delivery is restored.

If a speaker or tracker error occurs, the terminal will automatically enter the pause mode.

To continue dispensing fuel, press the "#" button.