GuardMagic DLLS-DLLE Programming Tool
(GM2.034)

User Manual

2013

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1. INTRODUCTION

"GuardMagic DLLS-DLLE programming tool" is the special technological complete set intended for customer programming and change the setting of **GuardMagic DLLS** and **GuardMagic DLLE** fuel level sensors by Personal Computer.

In additional **"GuardMagic DLLS-DLLE programming tool"** utility allows to carry out fuel tank calibration procedure.
Fuel tank calibration procedure is carried by Personal Computer (Notebook).

2. PACKAGES

2.1. STANDARD PACKAGE

- GuardMagic SCA (DLLS/DLLE sensor adapter: GM3.033)   – 1 pc.
- AC/DC (220V/12V) power adapter with cable   - 1 pc.
- Cable "USB A" – "USB-B"   - 1 pc
- Cable GM4.019   - 1 pc
- Cable GM4.019-01   - 1 pc
- "GuardMagic DLLS-DLLE programming tool" User Guide   -1 book
- CD disk with manuals and software   -1 CD

2.2. OPTIONAL (order in additional)

- Three pole WAGO connectors   .
(for connection to GuardMagic DLLS1ct or DLLS2ct fuel level sensor) - 4 pcs

2.3. PACKAGE

The complete set is packed into a box of corrugated cardboard

3. OVERWIEV OF MAIN COMPONENTS

GuardMagic SCA (GM3.033)
DLLS/DLLE sensor adapter:

**AC/DC (220V/12V) power adapter
with cable**

Cable "USB A" – "USB-B"

Cable GM4.019
(for connection to: GuardMagic
JBB01 barrier and to GuardMagic
DLLS1ct or DLLS2ct fuel level
sensors)

Коннектор RJ45
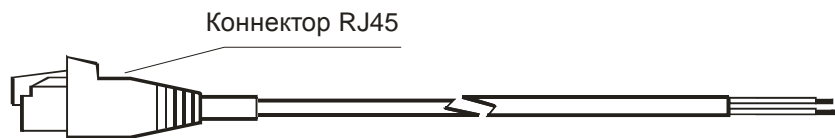
Cable GM4.019-01
(for connection to: GuardMagic
DLLS1a, DLLS1b fuel level
sensors)

Connector
RJ45

Connector
SuperSeal 4 poles
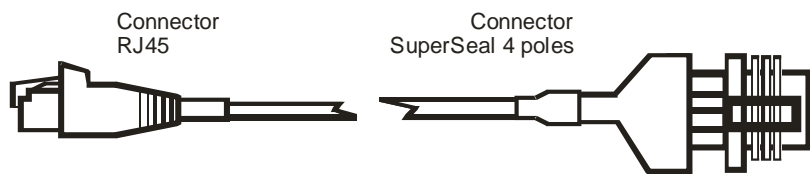
CD disk
with manuals and software

CD disk contents:
- DLLS/DLLE programming and fuel tank calibration
  software;
- FTDI utility
- "GuardMagic DLLS-DLLE programming tool" User
  Manual

4. SYSTEM REQUIREMENTS

System requirements to the PC:
- MS Windows XP, MS Windows Vista, MS Windows 7;
- Intel Pentium IV 600 or above (or AMD analogue);
- Main memory 256MB or above;
- 10 free space on a hard disk;
- Mouse and keyboard;
- USB port;
- Video adapter and color monitor with the resolution not less than 800 x 600;
- CD or DVD ROM.

5. GUARDMAGIC SCA OVERWIEV

5.1. ABOUT

GuardMagic SCA is a special interface adapter for converting USB interface to industrial EIA-485 (RS-485) interface.

5.2. GUARDMAGIC SCA FRONT PANEL

In GuardMagic SCA front panel located:
- EIA-485 connector (RJ45 type) for connecting to SCA adapter EIA-485 cable;
- Power LED (Green). Indicate that the SCA module is powering;
- USB LED (Red). Indicate that USB cable connected to PC

5.3. GUARDMAGIC SCA REAR PANEL

In GuardMagic SCA rear panel located:
- USB connector (USB-B) for connection SCA adapter to PC;
- Power connector (12 V, DC) for connection SCA adapter to power source (power adapter 12 V, DC).

6. GUARDMAGIC SCA CONNECTION TO PC AND POWER SOURCE

6.1. GUARDMAGIC SCA CONNECTION TO PC AND POWER SOURCE

GuardMagic SCA connection is shown bellow:

6.2. FTDI DRIVER ISTALLATION

Before operation will be need to install FTDI driver in your PC.

a) automatically installation
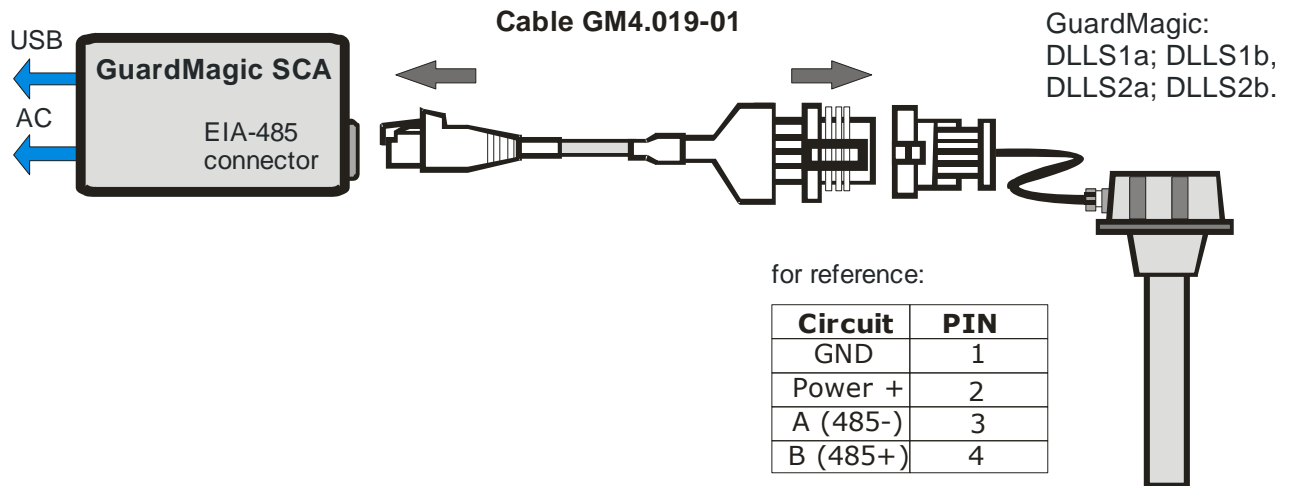Connect your PC to internet and connect your PC to SCA adapter. AC adapter connect to power source.
Windows automatically find a new device in your PC and automatically install FTI driver in your PC.

b) manual installation

  Copy FTDI driver from CD disk and install it in your PC.

7.1. GUARDMAGIC DLLS1a, DLLS1b, DLLS2a, DLLS2b CONNECTION

Cable GM4.019-01

USB

GuardMagic SCA

AC

EIA-485
connector

GuardMagic:
DLLS1a; DLLS1b,
DLLS2a; DLLS2b.

for reference:

Circuit	PIN
GND	1
Power +	2
A (485-)	3
B (485+)	4

7.2. GUARDMAGIC DLLE1ct (GUARDMAGIC JBB01) CONNECTION

Cable GM4.019

GuardMagic JBB01

USB

GuardMagic SCA

AC

EIA-485
connector

JBB01

In/Out1   In/Out2

Ex1   Ex2

Cable GM4.019

Wire mark	Circuit
Green	Power +
White	GND
Yellow	A (485-)
Red	B (485+)

+
GND

A

B

GuardMagic DLLE1ct;
DLLE2ct
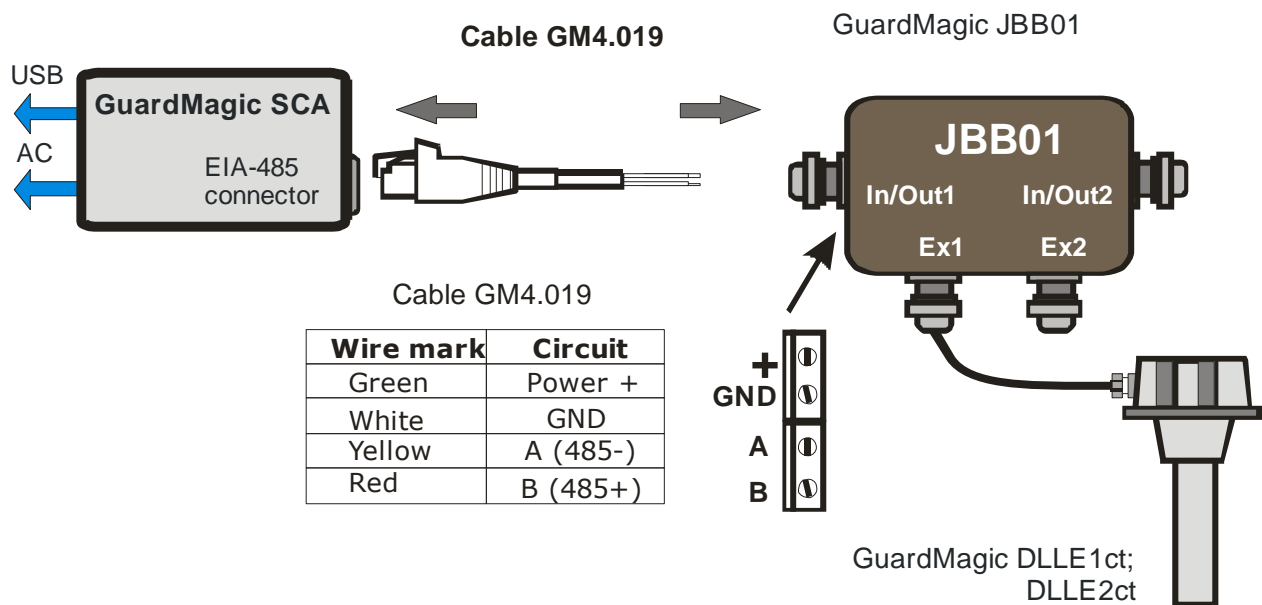
Note:

GuardMagic DLLE – GuardMagic JBB01 connection is shown in: GuardMagic JBB01 installation manual and GuardMagic DLLE installation manual

7.3. GUARDMAGIC DLLS1ct, DLLS2ct DIRECT CONNECTION

Cable GM4.019

WAGO connectors

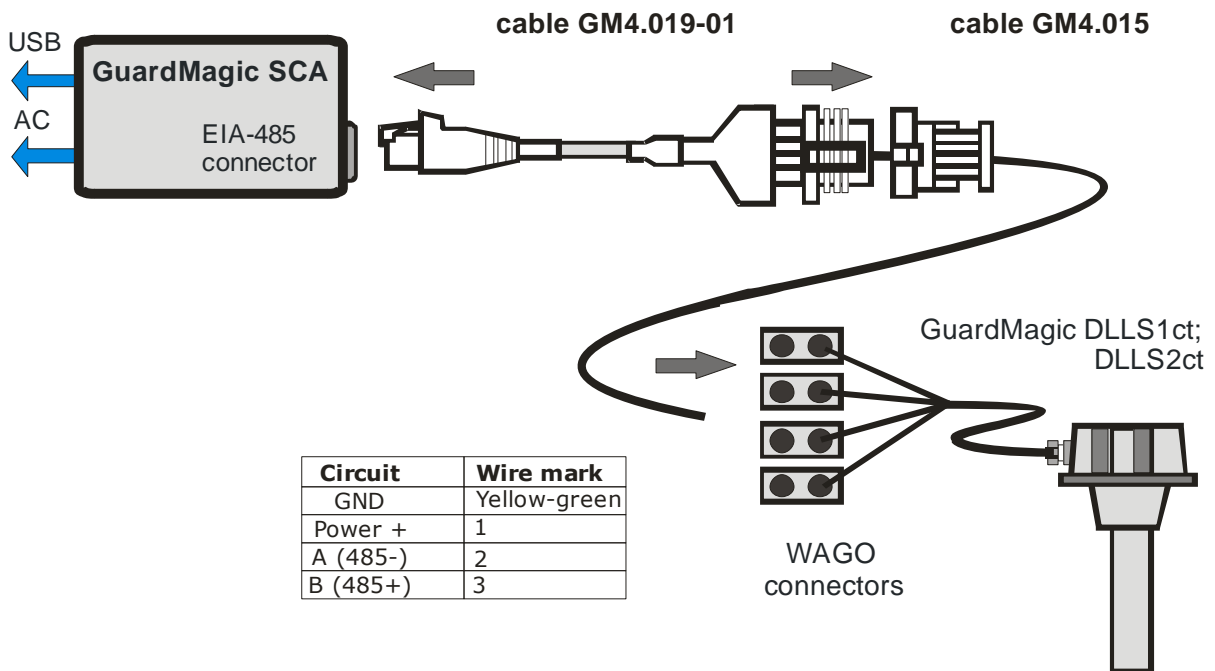GuardMagic DLLS1ct; DLLS2ct

USB

GuardMagic SCA

AC

EIA-485 connector

cable from fuel level sensor

cable GM4.019

Wire mark	Circuit	Wire mark
White	GND	Yellow-green
Green	Power +	1
Yellow	A (485-)	2
Red	B (485+)	3
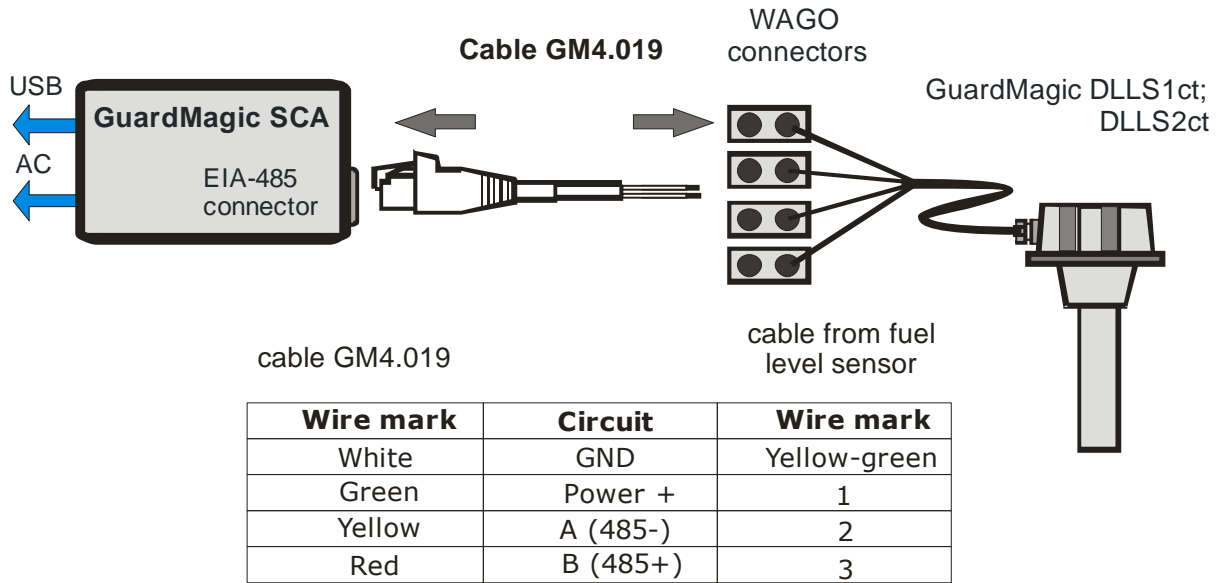
7.4. GUARDMAGIC DLLS1ct, DLLS2ct CONNECTION BY ADDITIONAL CABLE

cable GM4.019-01

cable GM4.015

USB

GuardMagic SCA

AC

EIA-485 connector

GuardMagic DLLS1ct; DLLS2ct

| Circuit	Wire mark
GND	Yellow-green
Power +	1
A (485-)	2
B (485+)	3

WAGO connectors

8. ORDER OF PROCEDURE

- Copy program "GM DLLS-DLLE PT" (FSProgrTool.exe) from CD disk to your PC hard disk;
- Connect SCA adapter to your PC (paragraph 6.1);
- Connect AC/DC adapter to power source and check LED status in SCA adapter. LED indicators in SCA adapter have to light;
- Install FTDI driver in your PC (paragraph 6.2);
- Connect fuel level sensor to to SCA adapter (paragraph 7);
- Run program "GM DLLS-DLLE PT" (description: paragraph 9);
- Start fuel level sensor setting (paragraph 10).

Notes:
Status of LED indicators

GREEN
(Power)

RED
(USB Connection)
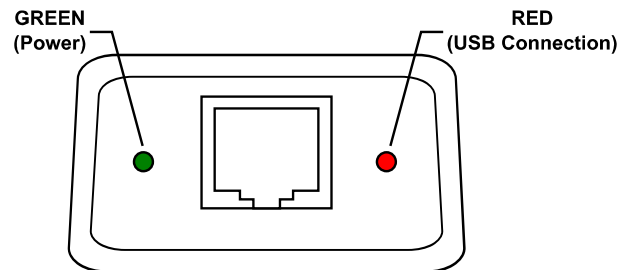
9. DLLS-DLLE PROGRAMMING TOOL SOFTWARE OVERVIEW

Start the program "GM DLLS-DLLE PT" (FSProgrTool.exe). After start the program on the screen will open the basic form, shown on figure.

9.1. SOFTWARE OVERVIEW

The "GM DLLS-DLLE PT" form consist of:
1. text menu;
2. "sensor data" part;
3. "settings" tab;
4. "calibration" tab;
5. connection settings and "Connect" button;
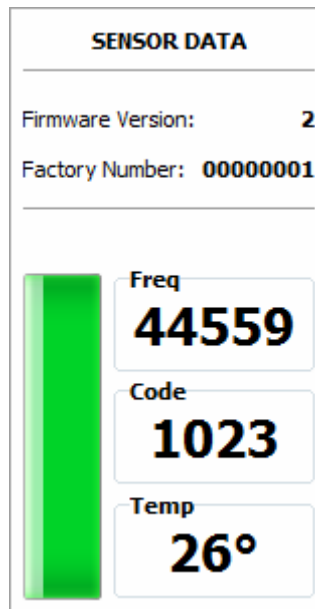6. status bar.

GuardMagic
www.guardmagic.com
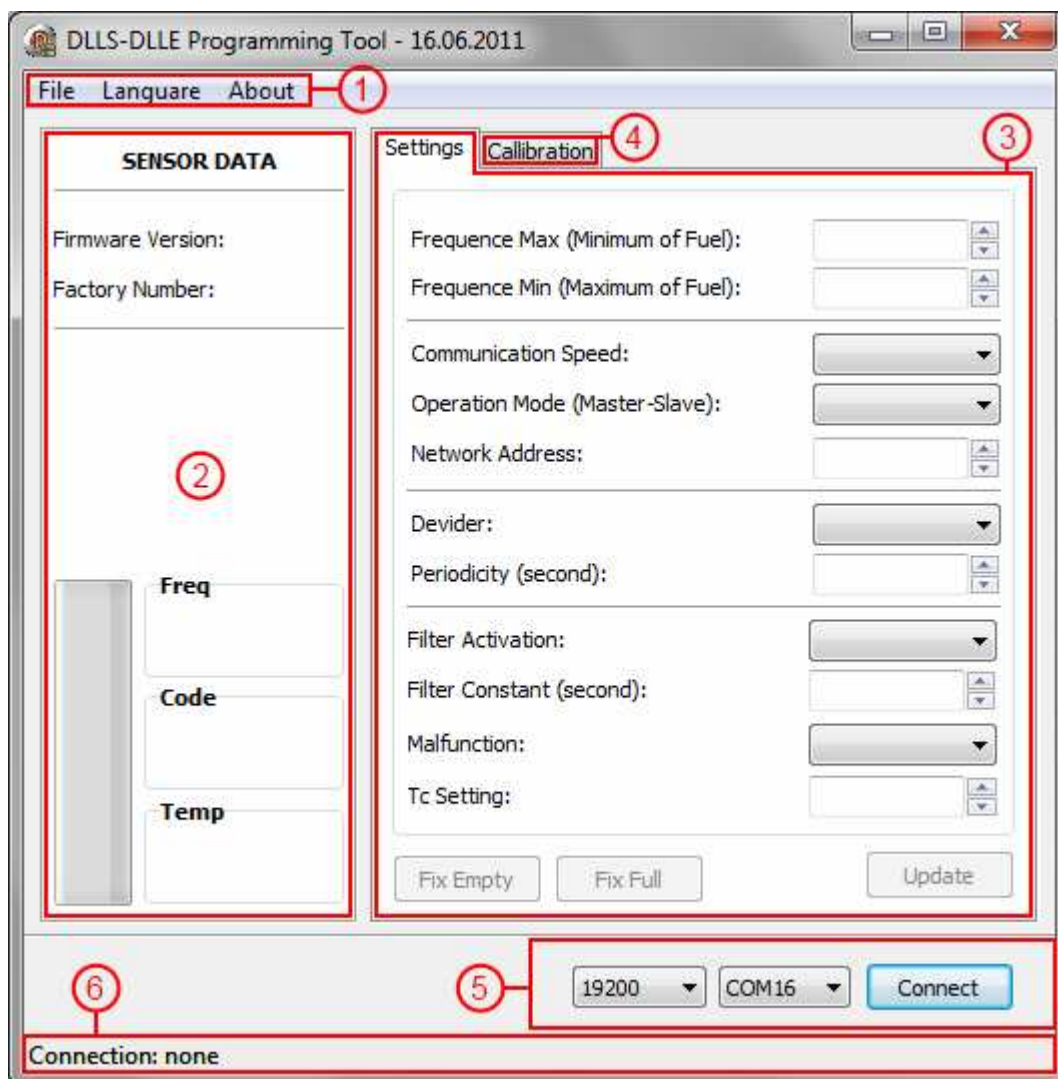
9.2. FILE MENU

File menu consists of the menu line with following items:

File Menu	Function Description
File	
Language	Choice of the working language
About	Information about the program

9.3. SENSOR DATA

Show sensor data:

Item	Function Description
Firmware Version	Fuel sensor firmware version
Factory Number	Fuel sensor factory number
Freq	Current frequency
Code	Current fuel level code
Temp	Current temperature
Fuel Meter	Shows current fuel level in the fuel tank

Frequency value and code value will change on fuel level change.

9.4. TAB "SETTINGS"

The tab "Settings" is intended for the programming of fuel level sensor parameters.

Item	Function Description
Frequency Max	Frequency of minimal fuel level in the tank
Frequency Min	Frequency of maximal fuel level in the tank
Communication Speed	Communication speed with which the fuel level sensor (19 200, 38 400, 57 600)
Operation Mode	Fuel level sensor operational mode (Slave - network mode, Master - stand alone mode)
Network Address	Fuel level sensor network address (available addresses - 1..23)
Divider	Select the value of sensor length which sensor you are using
Periodicity	Periodicity of data sending in "Stand Alone" mode (available values - 0..255)
Filter Activation	Activation of internal fuel filter
Filter Constant	Constant of data filter
Malfunction	Malfunction bit sending activation Some main modules can not support this functionality
Tc Setting	Calibration sensor internal thermometer. Set one temperature point.

9.5. TAB "CALIBRATION"

Item	Function Description
Calibration Table	
Clear Table	Clear Calibration Table
Liters	Fuel level value in liters
Add Value	Add current fuel level code and corresponding to it fuel level value

9.6. CONNECTION SETTING AND "CONNECT" BUTTON

Item	Function Description
Connection Speed	Fuel level sensor working speed (available values - 19200, 38400, 57600)
RS232 port number	Number of RS232 port to which fuel level sensor is connected
Connect / Disconnect	Connect or disconnect to the fuel level sensor.

9.7. STATUS BAR

Status bar is intended to show connection status. After connecting to the fuel sensor information about COM port number and connection speed is shown in the status bar.

10. PROGRAMMING PROCEDURE

The fuel level sensor programming procedure is consistently completing the required fields on the persistence and saving entered data.

For the data saving it is necessary to push button "Update".

10.1.   PIMERY FUEL SENSOR SETTING

Attention!!! Sensor adjustment should be provided with the same fuel type equal to the vehicle´s or machine operation fuel.

The DLLS, DLLE sensor scale should be adjusted after tube cutting. **«DLLS-DLLE Programming Tool»** software makes it.
Connect the sensor to PC by special 485 adapter (for example, **GuardMagic SCA adapter**).

Start "**DLLS-DLLE Programming Tool**" software. After starting the main window will be shown.
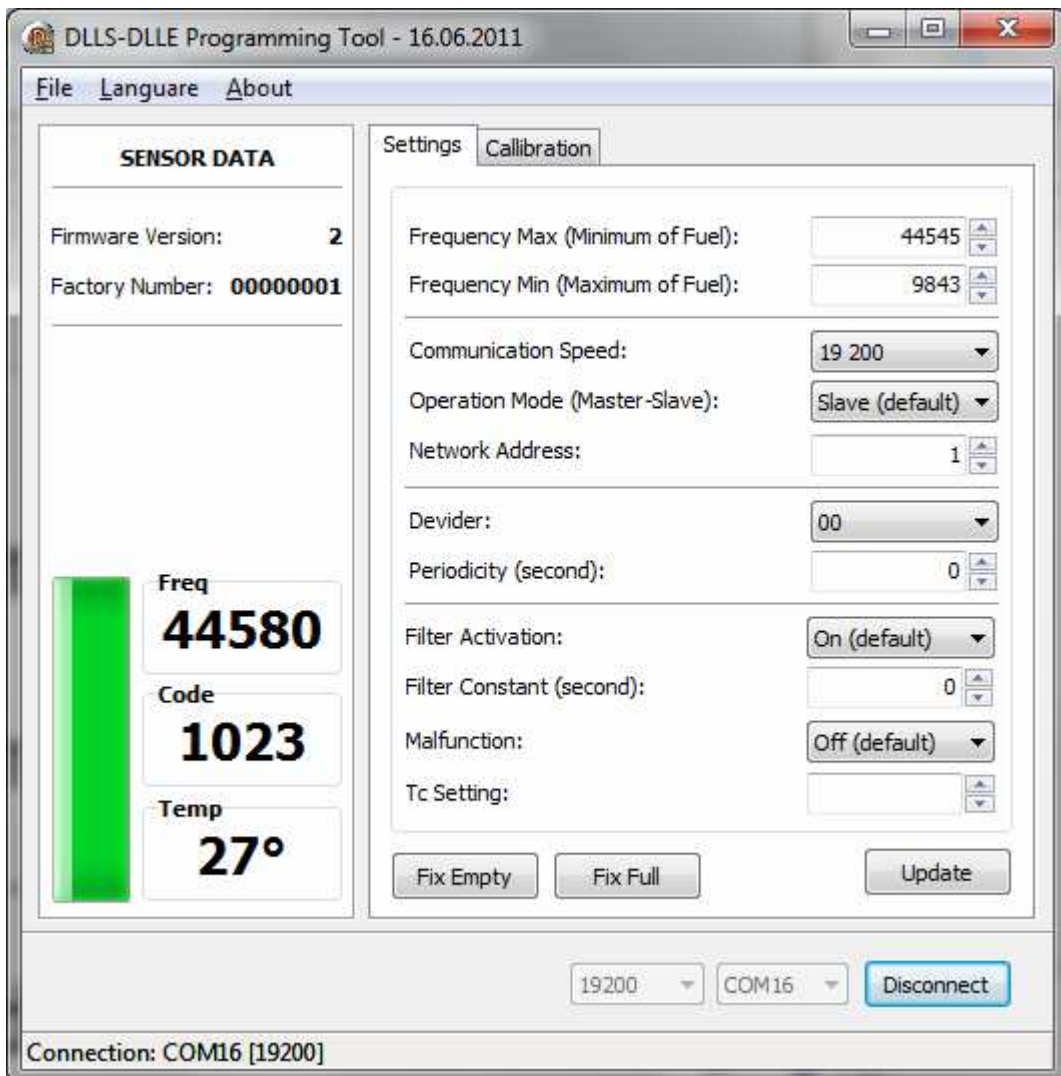
Primary fuel sensor setting steps

1. Select necessary "Communication Speed", "RS 232 Port" and press the button "Connect"
2. Put the sensor tube completely into the fuel, **pull out Sensor from the fuel,** wait for about 2 minutes, and then press "Fix Empty" button.
3. Put the sensor again completely into the fuel, wait for 2 minutes, and press "Fix Full" button.

10.2.   OPERATION MODE AND ADDRESS SETTING

Working mode of Fuel Sensor and Sensor Address setting are carried out also by "**DLLS-DLLE Programming Tool**" software.

When program is running select necessary "Operation Mode" and "Network Address" and press the button "Update".

11. FUEL TANK CALIBRATION

For fuel tank calibration it is necessary to select "Calibration" tab. See screenshot below.

Fuel Tank calibration procedure showing below is only for independently calibration without units GuardMagic VB, GuardMagic FSM, GuardMagic MTF3.

Fuel Tank Calibration procedure with units GuardMagic VB, GuardMagic FSM, GuardMagic MTF3 in detailed describe in this product installation manuals
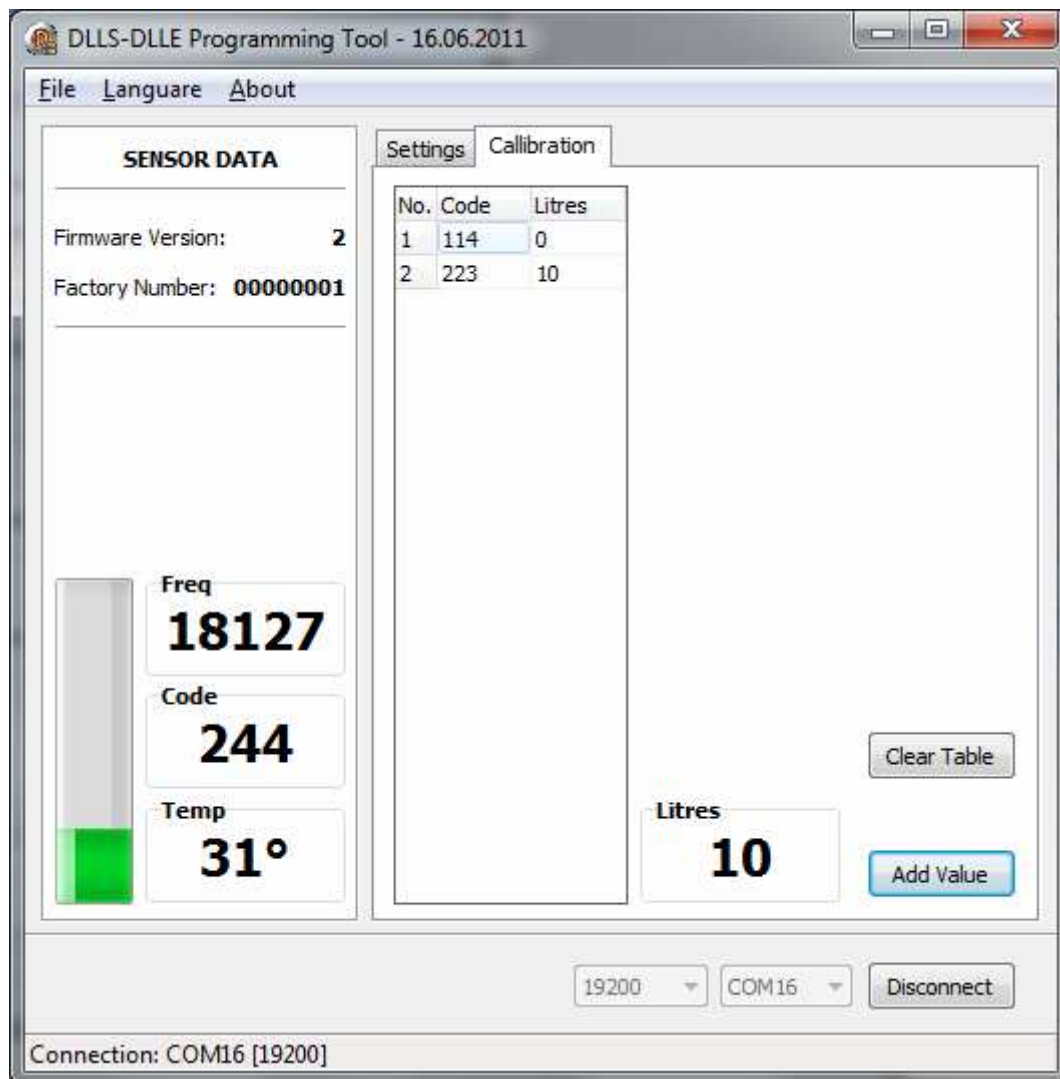
11.1.   PRINCIPAL PROVISIONS

Fuel tank calibration is consecutive fixing values of a level of fuel, which is filled in vehicle tank or tank trailer (regular or cargo), with the subsequent entering these data in the working program.

At carrying out of calibration operation it is convenient to take advantage of the form offered a calibration leaf p.7.4

As a measure of filled fuel is used the indicator of a filling station. Filling stations, as a rule, provide accuracy not worse 0,3 %. Code of filled fuel will be shown in calibration software.

At calibration procedure fuel is filled in with portions approximately on 1/10 - 1/20 volumes of a fuel tank. As a rule, carrying out of calibration need to be spent on 5 … to 15 control points.

Calibration procedure is carried out independently for each fuel tank and fuel level sensor.

11.2. ACTION ORDER OF CALLIBRATION PROCEDURE

Carrying out the operation of the calibration procedure is carried out in following order:
1. In a fuel tank of vehicle leave the minimal possible fuel level. This fuel level will be considered as MINIMAL level (like 1 liter); no more than 1%... 2 % of a tank volume;
2. Fix minimal value of the fuel by pressing "Add Value" button in program ("minimal fuel level" will be fix);
3. Insert a pistol of a fuel hose into a tank;
4. Add some control fuel to the fuel tank;
5. Wait till the value of the fuel level indicator in program will stop changes (field code). About 40 – 60 sec;
6. Enter the fuel level value in liters (field "Liters"). Press "Add Value" button;
7. Execute the indications of the previous paragraph till filling the fuel tank full with fuel.
8. Write down the table "fuel code" and "fuel volume" in the paper table.

In the future the values obtained for the calibration data table must be entered in the work program.

12. ABOUT FUEL LEVE SENSORS SETTING

- For operation with GuardMagic main modules (GuardMagic VB, GuardMagic VF, GuardMagic mTF3, GuardMagic FSL, GuardMagic FSM modules) fuel level sensor have to be in "**SLAVE MODE**";

- Fuel level sensor communication speed have to be "19 200 kbit/sec";

- In system based on GuardMagic products, sensors network address have to be:

Modules	Available sensor network address
VB3, VB6, VF2	• 001…003
VB4, VB5, VB6, VB7, VB8 Regular tanks	• 001…003
VB4, VB6 Service tanks	• 004…007
VB8 Cargo tanks	• 004…007 • 008…014
FSM2/1 ; FSL	• 008…010
FSM3	• 008…010

- For standard application filter activation have to be "ON"

- For standard application filter constant have to be 5 … 10 (for vehicle can be start with code: 10). Variation of filter constant allow to make "Fine Tune" of system.

- By default "Malfunction" has to be "Off".

Main notes:

- **About divider code**.
"Divider code" depends of sensor length. Divider code have by default of factory sensor setting.