TechnoKom

GLONASS · GPS

Incoming messages
Send message

UP
DOWN
BACK
SELECT

DOCUMENT
VERSION
1.0.0

AutoGRAPH
INFO TFT

USER MANUAL

Table of content

Software Copyright Notice

Introduction

This User Manual applies to AutoGRAPH-INFO-TFT informational display (hereafter - display, device) produced by TechnoKom Ltd. It contains installation and connection procedures of this device, as well as its function and control. This Manual constitutes the Operating Rules to be observed to ensure successful operation of the controller and its compliance warranty provisions.

The Manual is intended for specialists who are aware of maintenance and installation principles typical for motor vehicles and are proficient in using the electronic and electrical equipment of various vehicles.

To ensure the best performance of AutoGRAPH-INFO-TFT devices, they should be installed and set up only by qualified specialists.

This User Manual contains the instructions intended only for AutoGRAPH-INFO-TFT devices and does not contain connection and configuration instruction for external devices which may be connected to the displays (AutoGRAPH on-board controller, TKLS fuel level sensors and etc.). For detailed information on connection and configuration of other devices see the User Manuals intended for those devices.

IMPORTANT

All information on functions, functional capabilities and other specifications related to AutoGRAPH-INFO-TFT informational displays, as well as all information contained in this User Manual is based on current data (at time of writing) and is deemed to be valid as of the date of publication. TechnoKom reserves the right to modify the information or specifications without prior notice or commitment.

Version history

This table provides a summary of the document revision.

Version	Description	Data
1.0	Initial version of the document	2016-01

Product Overview

The AutoGRAPH-INFO-TFT informational display is intended for installation on a vehicle and provides following functionality:

• connected to the AutoGRAPH on-board controller the display allows a dispatcher and a driver to exchange short text messages in order to provide executive control of the driver and vehicle operation;

• connected to the AutoGRAPH on-board controller the display provides indication of vehicle operation parameters such as motion characteristics, data from CAN bus, data from sensors connected to the AutoGRAPH controller;

• connected to the AutoGRAPH on-board controller the display provides indication of data from the fuller;

• automatical announcement of public transport stops due to the special mode «Auto informer»;

• the display allows a public transport driver to communicate with passengers through a loud speaker;

• equipped with external photo cameras the display allows photo recording of vehicle inside and outside;

• display of data on display boards;

• transmission of alarm signal in emergency;

• the display indicates data received from connected fuel level sensors (fuel level and fuel temperature) and other sensors supporting LLS protocol.

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IMPORTANT   *Data transfer is possible only when GSM mobile network operator, which supports General Packet Radio Service (GPRS), is available.*

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Technical Specifications

Description	Value
Processor	ARM Cortex-M4 LPC 4078FET208
GNSS receiver[1]	ublox MAX-M8Q
Supported GNSS	GLONASS / GPS, QZSS, BeiDou
Channels	72
Time to first start[2], s	26
Accuracy: • position, m • velocity, m/s	2.0 (CEP) 0.05
Type of GLONASS / GPS antenna[3]	External (SMA)
Display	5", 800 x 480 pixels
Display technology	TFT, touchscreen
Internal FLASH memory, records	up to 270.000
External memory	microSD, up to 32 GB
Connection to PC	USB 2.0
Connection to AutoGRAPH on-board controller	RS-485
Digital inputs, total number	4
Digital high-impedance inputs, total number	1
Digital outputs, total number	1
Audio outputs, total number	2
Audio output power, W (per an output)	6
RS-485 bus (TIA / EIA-485-A)	3
Operating voltage, V	10...60
Power consumption at 12 (± 0,5) VDC, mA: • Normal mode • Playback mode	250 1900
Operating temperature, °C	-40...+85
Weight, g	270
Dimensions, mm	160 x 96 x 37
Average life time, years	10

[1] Optional.

[2] With nominal GNSS signal levels -130 dBm.

[3] Optionally AutoGRAPH-INFO-TFT can be equipped with an internal antenna.

Scope of Supply

№	Description	Qty
1	AutoGRAPH-INFO-TFT informational display	1 pc.
2	Power supply cable (primary)	1 pc.
3	6-pin RS-485 cable[1]	1 pc.
4	4-pin loudspeaker cable[1]	1 pc.
5	GPS/GLONASS antenna[2]	1 pc.
6	Push-to-talk (PTT) switch	1 pc.
7	MicroSD, 4 GB	1 pc.
8	1A fuse with a holder	1 pc.
9	Warranty certificate	1 pc.

[1] Optional, on request.

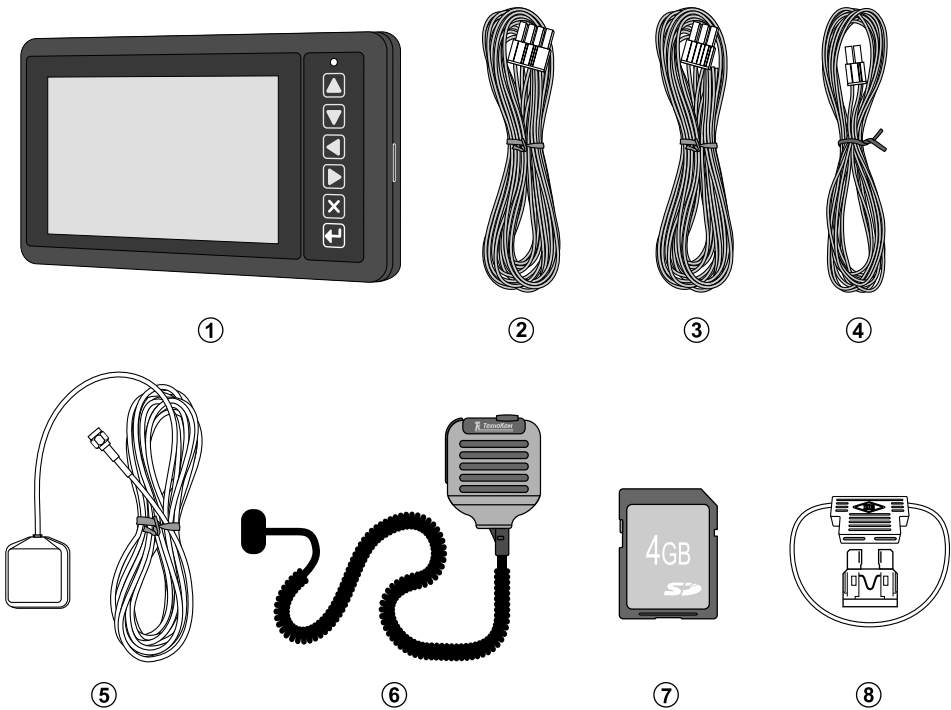[2] Related to the modification with an external antenna.

Fig.1. Scope of supply.

Components of AutoGRAPH-INFO-TFT

Main

1. **TFT Display.**
2. **Control buttons[1].**
3. **LED.**
4. **Mini USB connector.**
5. **MicroSD slot.**
6. **Speaker.**
7. **Holder mounting holes.**
8. **Manufacturer's label.**
9. **Power connector.**
10. **RS-485 interface connector.**
11. **Loudspeaker interface connector.**
12. **GLONASS/GPS antenna connector.**
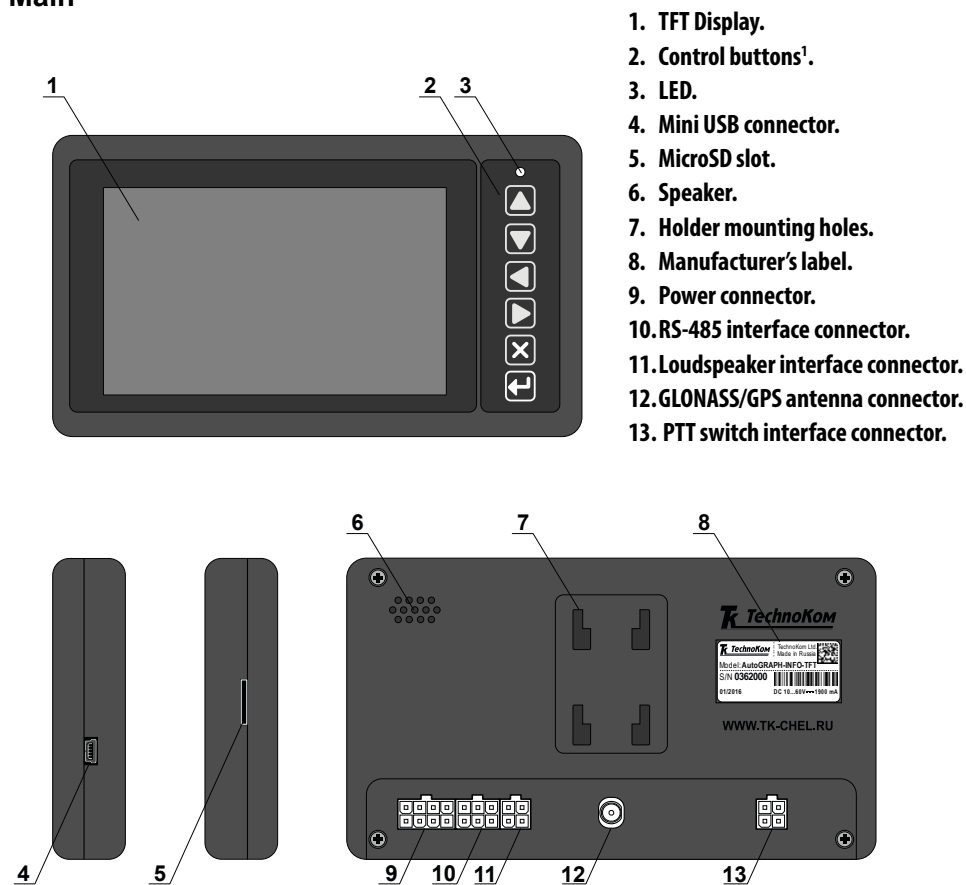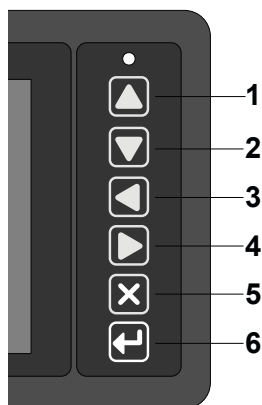13. **PTT switch interface connector.**

Fig.2. AutoGRAPH-INFO-TFT components.

Buttons on front panel

1. UP.
2. DOWN.
3. LEFT.
4. RIGHT.
5. CANCEL.
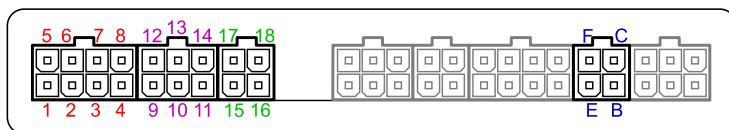6. SELECT.

Interface Connectors

Fig.3. Interface connectors.

* Highlighted grey are connectors not used in the current hardware version of AutoGRAPH-INFO-TFT.

Power connector (primary)

№	Colour of a wire in a cable	Assignment
1	Red	«+» Vin
2	Black	«-» Vin
3	Yellow	Digital input 2 (active high)
4	Green	«+» Digital input 1
5	Pink	High-impedance digital input
6	Grey	Open collector output 1 (0.5 A)
7	White	Digital input 3 (active high)
8	Brown	«-» Digital input 1

6-pin RS-485 interface connector

№	Colour of a wire in a cable	Assignment
9	Brown with a blue stripe	RS-485-1 (A): display board interface
10	Red with a white stripe	RS-485-2 (A): camera interface
11	Orange with a white stripe	RS-485-3 (A) AutoGRAPH controller interface
12	Orange with a green stripe	RS-485-1 (B): display board interface
13	Black with a white stripe	RS-485-2 (B): camera interface
14	Brown with a white stripe	RS-485-3 (B): AutoGRAPH controller interface

4-pin loudspeaker interface connector

№	Colour of a wire in a cable	Assignment
15	Blue	«+» Left loudspeaker
16	Grey	«+» Right loudspeaker
17	Blue with a white stripe	«-» Left loudspeaker
18	Grey with a white stripe	«-» Right loudspeaker

Audio connector

ID	Assignment
B	Microphone signal input
C	Not used
E	Ground
F	Call / Answer button input

Additional connectors

On the left side panel   *On the right side panel*

A   D

Fig.4. Additional connectors.

ID	Assignment
A	Mini USB connector (programming / configuration)
D	Micro SD slot

Connection diagrams of AutoGRAPH-INFO-TFT

This section covers connection procedures of AutoGRAPH-INFO-TFT

- Power supply connection
- Digital inputs / outputs connection
- Connection to the AutoGRAPH onboard controller.
- RS-485 bus connection.
- Connection of a loudspeaker and PTT switch.

Full capacity of AutoGRAPH-INFO-TFT is provided when it is connected to the AutoGRAPH on-board controller. AutoGRAPH-INFO-TFT can be connected to any AutoGRAPH on-board controller which is equipped with RS-485 bus.
Connection to the AutoGRAPH controller allows AutoGRAPH-INFO-TFT to send data to server and exchange SMS with a dispatcher.
Before connecting AutoGRAPH-INFO-TFT to AutoGRAPH controller, GPS/GLONASS and GSM antennas must be connected to the controller according the instructions given in the User Manual of the AutoGRAPH controller.

POWER SUPPLY CONNECTION

The AutoGRAPH-INFO-TFT is connected to the power supply source through the primary interface cable supplied with the device. Also the AutoGRAPH-INFO-TFT is supplied with a fuse intended to provide a short circuit protection of power supply driver. The fuse holder is installed on a wire ring, which should be cut before installation.

When making connections, pay special attention to the safety rules stipulated by the regulations for motor vehicle repair procedures. All connections should be properly isolated and securely connected. If the wire is too short, it can be spliced with a wire of at least 0.5 mm^2 cross section (20 AWG or thicker).

The power supply input of the AutoGRAPH-INFO-TFT is rated for the vehicle system operating voltage of 10-60 V DC. The pin 1 of the device Power connector must be connected to 12 or 24 V of vehicle operating voltage through a fuse rated for at least 1 A.

The scheme of power supply connection to the AutoGRAPH-INFO-TFT depends on the power supply connection to AutoGRAPH controller. So power can be fed to the display either before or after the vehicle's battery disconnecting switch:
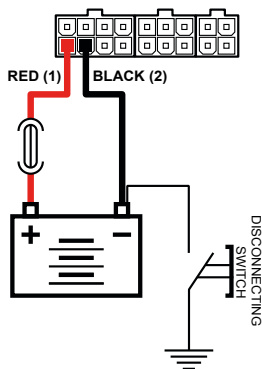

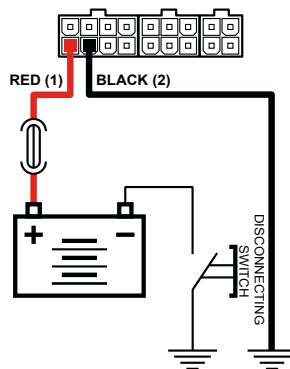Fig.5. Power connection before the vehicle battery disconnecting switch.

Fig.6. Power connection after the vehicle battery disconnecting switch.

IMPORTANT

The fuse should be placed as close as possible to the point where the AutoGRAPH-INFO-TFT is connected to the vehicle power system.

DIGITAL INPUT 1 («+» DIGITAL INPUT 1 AND «-» DIGITAL INPUT 1)

AutoGRAPH-INFO-TFT is equipped with a digital input which logic of operation depends on how an external device is connected to the input (Input 1).
Depending on the connection diagram the Input 1 may operate as active low input or active high one.

The input is able to show change of the input state and intended to connect various dry contact sensors, e.g. door limit switches or any button.

Internal Connection Diagram of Input 1:

Variant 1

This type of connection provides that the input is in active state (logical 1) when it is connected to +Vin.
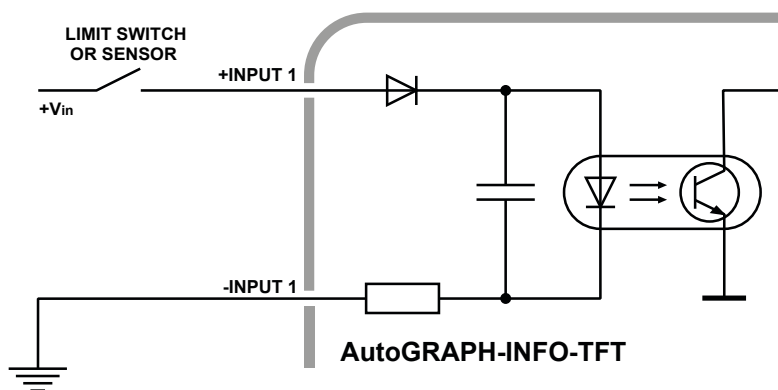
Fig.7. Digital input 1 connection diagram. Variant 1.

Variant 2

This type of connection provides that the input is in active state (logical 1) when it is connected to -Vin.
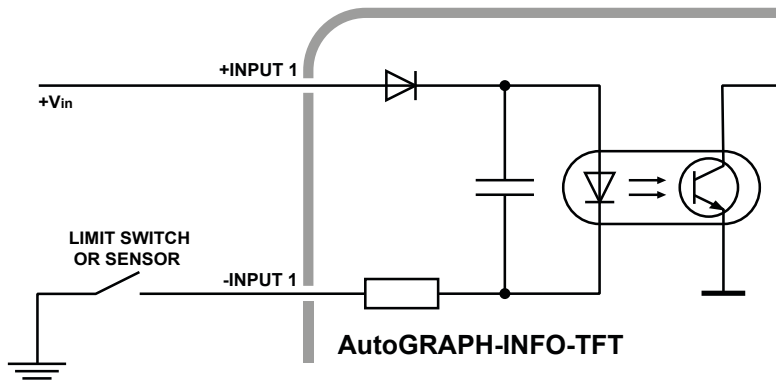
Fig.8. Digital input 1 connection diagram. Variant 1.

DIGITAL INPUTS 2 AND 3

AUTOGRAPH-INFO-TFT is equipped with two active high digital inputs: pin 3 and pin 7 on the Power connector.

Active high digital input has two states:
• logical «1», when the input is powered by supply voltage. This state is considered to be active.
• logical «0», when the input is connected to the ground or open-circuit.

NOTE *It should be noted that all voltage levels of active high digital inputs under 5 V will be considered to be logical zero ('ground'), while all voltage levels above 6 V shall be considered to be logical «1» (active). If the input is open-circuit it shall denote logical «0» .*

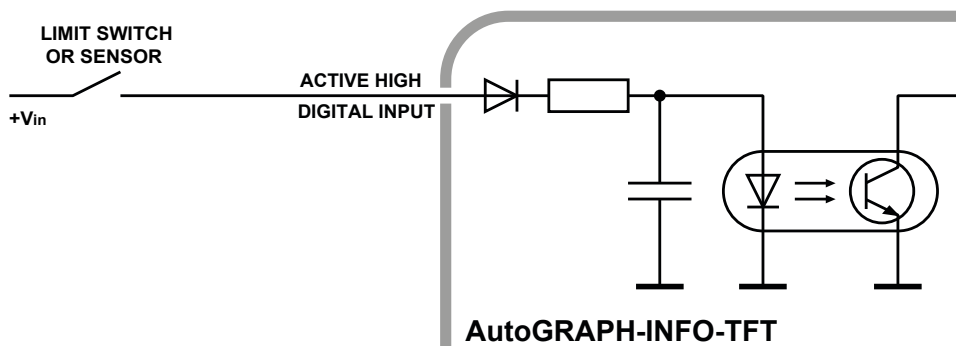**Internal Connection Diagram of Active High Digital Input:**

Fig.9. Connection diagram of digital inputs 2 and 3.

CONNECTION OF HIGH-IMPEDANCE DIGITAL INPUT

AutoGRAPH-INFO-TFT is equipped with a digital high-impedance input: pin 5 on the Power connector.
High-impedance active high digital input is intended to connect a device with a voltage output to the display, e.g. a voltage output temperature sensor.

The high-impedance input has two states:
• logical "1" – when the input voltage is greater than 7 V;
• logical "0" – when the input voltage is lower than 3 V.

If the high-impedance input is open-circuit it shall denote logical "0".

The input resistance of the high-impedance input is 1 mega-ohm (1MΩ).
The cut-off frequency of the input low-pass filter is 5,000 Hz.

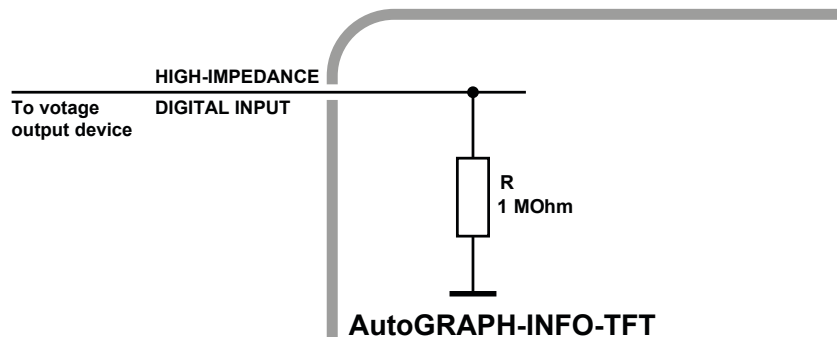**Internal Connection Diagram of High-impedance Input:**

Fig.10. Connection diagram of high-impedance input.

DIGITAL OUTPUT

AutoGRAPH-INFO-TFT is equipped with a digital open-collector output: pin 6 on the Power connector.
The output is intended to control various external actuators, as well as to activate warning devices.

Minimum recommended load current is 10 mA.
Maximum load current should not exceed 500 mA.
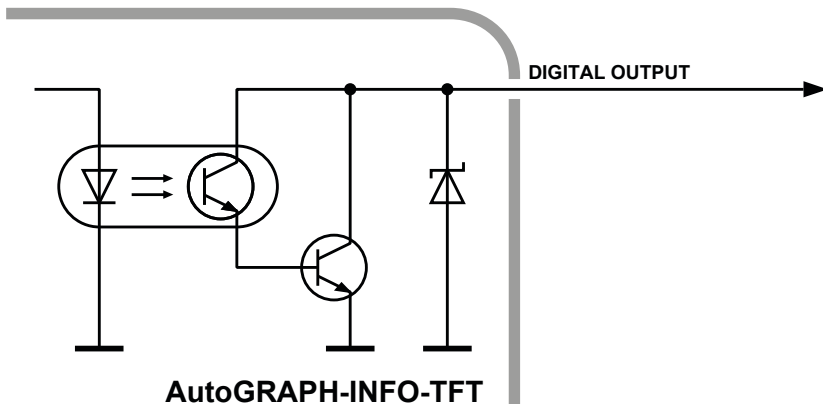
Internal Connection Diagram of Output:

Fig.11. Digital output connection diagram.

NOTE

The current version of AutoGRAPH-INFO-TFT firmware does not support control of the digital output.

External Connection Diagram of Digital Output:

The following is an example of a relay connected to the display output. To avoid damage of the display output due to back EMF, induced from disconnecting an inductive load, connect a protective diode in parallel to the relay. To select a correct diode, make sure that direct current of this protective diode is at least 1.5 times greater than the relay holding current.
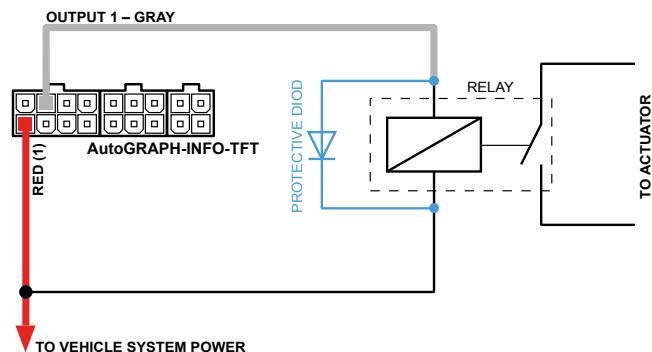

Fig.12. Digital output connection diagram.

LOUDSPEAKER CONNECTION

AutoGRAPH-INFO-TFT is equipped with two audio outputs intended to connect loudspeakers to the display, e.g. loudspeakers installed in the passenger compartment.
Pins intended for connecting the loudspeakers are arranged on the 4-pin loudspeaker interface connector: pin 15 and pin 17 are intended for connection of left loudspeaker, pin 16 and pin 18 – for right loudspeaker.

Minimum load resistance must be at least 4 Ohm. Maximum load resistance must not exceed 16 Ohm.
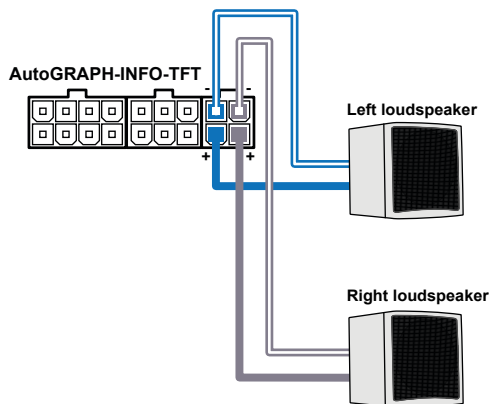
Connection Diagram of Loudspeaker:

Fig.13. Loudspeaker connection diagram.

RS-485 BUS

RS-485 is one of the most commonly used industrial standards of communication. A network based on an RS-485 interface consists of transceivers connected with twisted pair wires. All devices are connected to one twisted pair in the same manner: non-inverting outputs (A) to one wire and inverting outputs (B) to another wire.

AutoGRAPH-INFO-TFT is equipped with 3 RS-485 buses, each of them is intended for connection of specific devices. This can be taken into account when making the connection because if incompatible device is connected to RS-485 bus, proper operation of that device is not provided.

Given below is description of RS-485 buses assignment:

• RS-485-1 bus is intended for connection of display boards supported by AutoGRAPH-INFO-TFT.

• RS-485-2 is intended for connection of photo cameras.

• RS-485-3 is intended for connection of the AutoGRAPH onboard controller and sensors supporting LLS protocol.

RS-485 interface pins are arranged on the 4-pin RS-485 connector.

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NOTE

Detailed information on how to configure AutoGRAPH-INFO-TFT for operation with display boards, photo cameras, the AutoGRAPH onboard controller, and fuel level sensors via RS-485 bus is given in following sections of this document.

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Connection to PC

Some cases may require connection of the AutoGRAPH-INFO-TFT device to a personal computer (PC) or a laptop, e.g. for configuration using the DisplayConfigure application.

The AutoGRAPH-INFO-TFT is connected to a PC using standard AM – USB mini B 5pin Data-cable.

To connect the AutoGRAPH-INFO-TFT to a PC:

• Disconnect the device from vehicle power supply and external devices.

• Connect the device to PC using Data-cable.

• If the required drivers are installed, the system will automatically identify the connected device. If the drivers are not installed, install them following the steps specified in the «Drivers installation» section. Now the device is ready to operate with the applications.

AutoGRAPH-INFO-TFT configuration tool

Using the DisplayConfigure software, you can set up AutoGRAPH-INFO-TFT. This software allows you to configure the display for operation with external devices, edit templates of standard messages and etc.

For proper operation of the DisplayConfigure software, the .NET Framework 4.0 package (supplied) is required.

To set up AutoGRAPH-INFO-TFT:

• connect power supply to the display;

• connect the display to a PC following the instruction given in section "Connect to PC";

• run the DisplayConfigure software;

• on the DisplayConfigure software, press the "Find devices" button (Fig.14, i.1) to search for the connected devices;

• select serial number of the required device in the list of available devices (Fig.14, i.2) and press the «Open» button (Fig.14, i.3). If the option «Read configuration automatically» is enabled, the device settings will be read in the application. If the settings haven't been read automatically, press the «Read» button;

• set up necessary settings on the software tabs;

• enter the device password in the «Password» field (Fig.15, i.1), then press the «Write» button (Fig.15, i.2) to save the specified settings in the connected device;
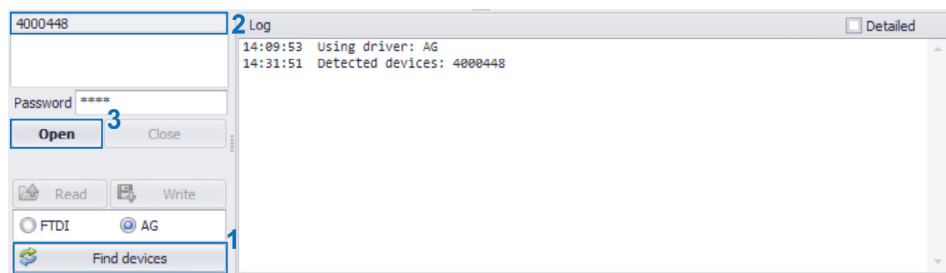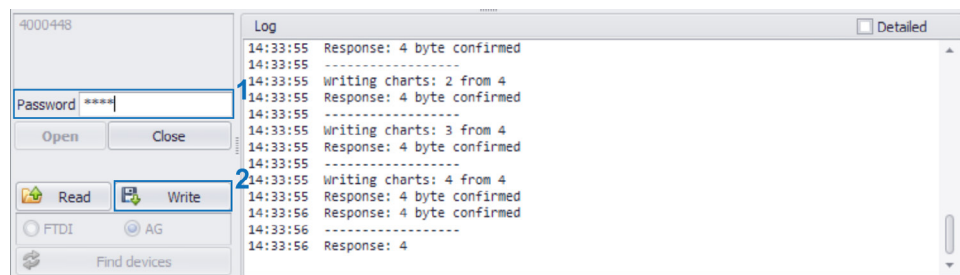

Fig.14. Connect the display to PC.

Fig.15. Save settings in the display.

Export configuration from external file

Device configuration can be exported in the file of .dconfig format and then used to set similar settings in several devices. To save the settings to external file, select *Main menu/File/Save as...* (Fig.16) in the DisplayConfigure tool. To load a configuration file in the DisplayConfigure application, select *Main menu/File/Open* (Fig.17).
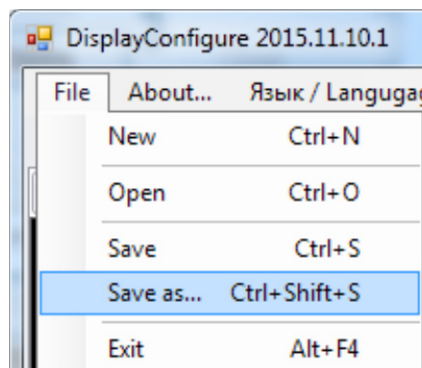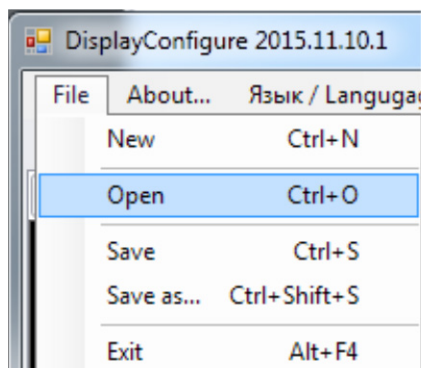

Fig.16. Save configuration.

Fig.17. Open configuration.

Getting started

AutoGRAPH-INFO-TFT turns on immediately after connecting it to power supply source. If AutoGRAPH-INFO-TFT is connected to the AutoGRAPH on-board controller, it will display the current time on the main screen after the turning on (Fig.18). As AutoGRAPH-INFO-TFT is equipped with real-time clock, the current time will be taken from the timer if the device is not connected to the AutoGRAPH controller.

NOTE

For the first start, the time 05:00 will be set up in the device, if it is not connected to the AutoGRAPH controller. To adjust current time, go to the Main menu/Settings/Local time. More detailed information on how to set up the device time is given in the section «General settings» of this document.
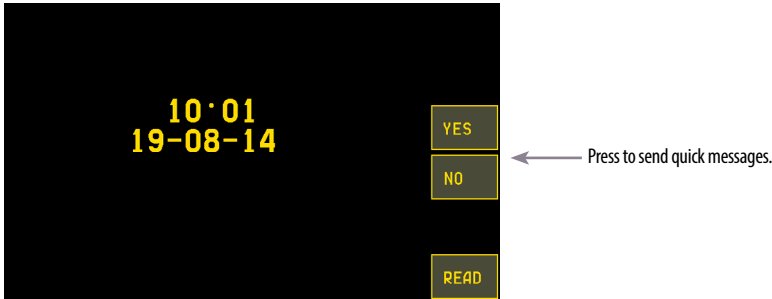

Press to send quick messages.

Fig.18. Main screen

Buttons "Yes" and "No" on the main screen allows you to send quick replies "Yes" or "No" to a dispatcher. These buttons are available only when the Custom profile of messages is set up. The MENU button is intended to go to the device main menu.

Use these buttons to browse the menu

Press to return to the Main screen
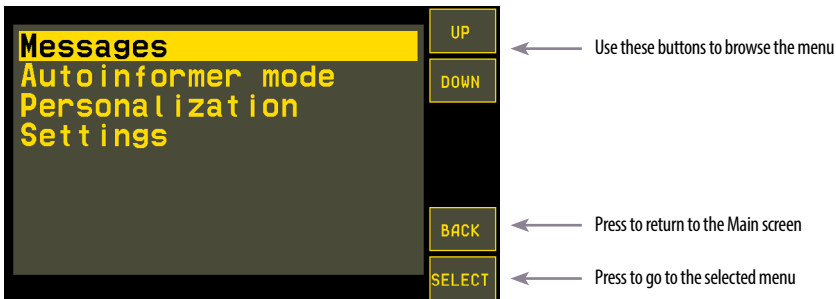
Press to go to the selected menu

Fig.19. Main menu.

In the Main menu to go to any section of the menu, you need to select it using the UP and DOWN buttons, then press the SELECT button. You also can tab the required item of the menu to select it.
Similar to the SELECT button press, double click a menu opens it.

Also you can use control buttons on the front panel of AutoGRAPH-INFO-TFT to browse the menu and select necessary items. Capability of the buttons on the front panel depends on the active menu and are displayed on the device screen.

Status bar at the top of the main screen contains icons intended to indicate vehicle operation: GSM signal level, navigation state and GSM modem error codes.

Described below is GSM modem error codes:

Error code	Description of error
PWR	Bad power of GSM modem or failure of GSM modem power supply monitor
MOD	GSM modem does not response
SIM	SIM is not inserted or unknown SIM error
PIN	PIN error
PUK	PUK is required
REG	Data transmission is required, but no data is transmitted for a long time Data transmission capability is unavailable for a long time Unable to connect to GSM network
NET	GPRS status is unavailable for a long time Multiple errors occurred when enabling GPRS Multiple errors occurred when connecting to data server Connection to server is unavailable for a long time Connection to server is established, but data transmission is not initialized
OPR	Data transmission is disabled by mobile operator
SRV	The device is not serviced by the server Invalid server password

Statuses indicated on the status bar are received from the AutoGRAPH controller. Transmission of operation statuses via RS-485 is supported by AutoGRAPH controllers with firmware of version AGXL-11.62 and higher.

Special-purpose key combinations

Using combinations of buttons described below you can enable special functions of the display. Only buttons on the display front panel can be used for this purpose.

• UP+DOWN – displays the device firmware version on the main screen.

• CANCEL+ENTER – sends alarm signal (see section "Alarm signal").

• CANCEL+UP+DOWN – sets default settings in the display. This combination is available within 20 seconds after the device turning on.

• CANCEL+UP – resets Accumulable counters which have been preset in the device.

General settings

To set preferences of AutoGRAPH-INFO-TFT such as screen brightness, key tones, interface language, and etc., select *Main menu/Personalization*.
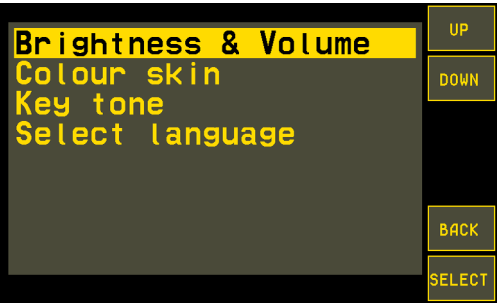

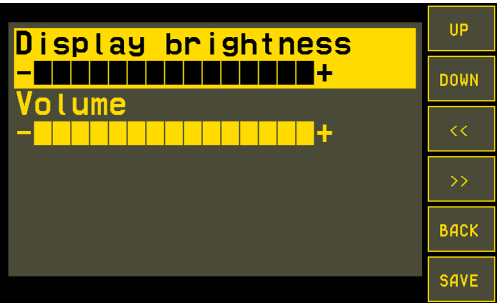Fig.20. Personalization menu.

Brightness and Volume

To tune display brightness of the device, you need to go to the Brightness and volume menu, then select the Display brightness option using the UP and DOWN buttons. To set the required brightness level, use buttons «<<» and «>>» then save the selected setting pressing the SAVE button.

To tune volume of the display sounds, you need to go to the Brightness and volume menu, then select the Volume option using the UP and DOWN buttons.

Fig.21. Brightness and volume.

To set the required volume level, use buttons «<<» and «>>» then save the selected setting pressing the SAVE button.

Colour skin
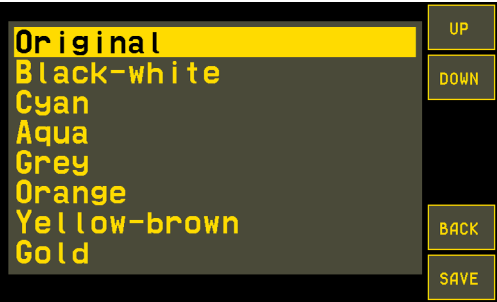
To select colour of the display menus, go to the Colour skin menu. When you select a colour skin, it is applied to the current menu in order to show a preview. To apply the selected skin to the device completely, press the SAVE button. To turn to last saved skin and exit from the Colour skin menu, press the BACK button.

Fig.22. Colour skin.

Key tone

To set up a type and duration of the device key tone, you need to go to the Key tone menu.

There are two sections:

• **Tone duration** is intended to select duration of the tone: short, medium, long or none (disables key tones).

• **Tone frequency** is intended to select frequency (in Hz) of the tone.
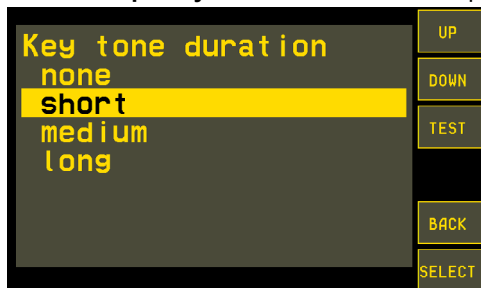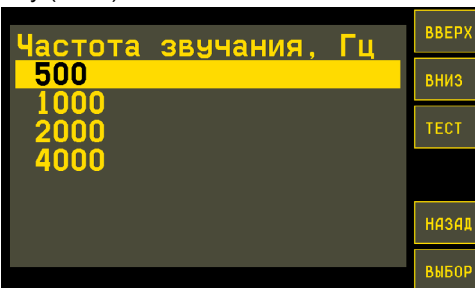
Fig.23. Tone duration.

Fig.24. Tone frequency.

Before you apply the selected tone setting, you can do a test. To do it, select the required item – frequency or duration using the UP and DOWN buttons, and press the TEST button. Then try to press the device buttons.

In order to save the selected settings, press the SELECT button.

Select language

To select AutoGRAPH-INFO-TFT interface language, you need to go to the Select language menu then select a language using Up and DOWN buttons. To apply settings, press the SELECT button.

The selected language will be set without device restart.

Fig.25. Interface language.

Date and time

It is recommended to set date and time in the device according to its location. To adjust date and time, select *Main menu/Settings/Local time*.
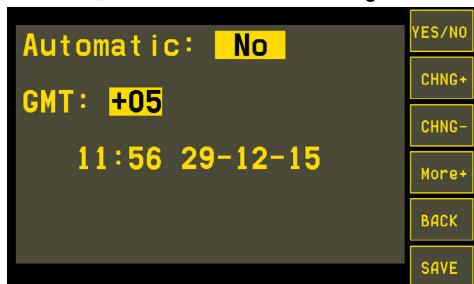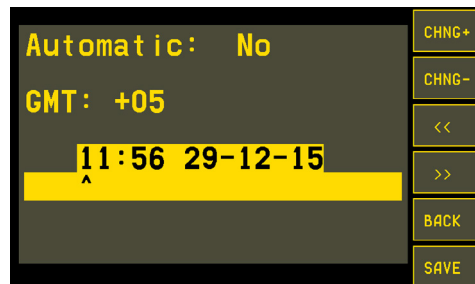
Fig.26. Time zone.

Fig.27. Date and time.

• To set up the device time zone in the form of a GMT offset, use the buttons "<<" and ">>". E.g. the offset +05 is a time zone used in following countries: Maldives, Pakistan, Tajikistan, Turkmenistan, Uzbekistan.

• Local time zone is only used to display time on the main screen. In other device menus, data is displayed in GMT. Also the display records data in an internal memory in GMT. This feature can be locked in order to provide data recording in local time (see the section "Lock device functions" for more detailed information).

• Use the YES/NO button to enable/disable the Daylight Saving Time.

• To set up current date and time, press the More+ button in the Local time menu (Fig.26). This will enable additional buttons (Fig.27). Then, you need to select a value to edit using the buttons ">>" and "<<". As the value is selected, use the CHNG+ button to increase it or use the CHNG- button to decrease the value.

• To apply new time settings, press the SAVE button.

> **IMPORTANT**
>
> *If AutoGRAPH-INFO-TFT is not equipped with an internal real-time clock, time tuning is unavailable, that's why the More+ button is hidden. That device will receive current time from the connected AutoGRAPH controller. If no AutoGRAPH controller is connected, AutoGRAPH-INFO-TFT will display default time 05:00.*

Settings protection

AutoGRAPH-INFO-TFT settings are protected with a password which can be from 4 to 8 characters long. This password is required in order to change the device settings using the DisplayConfigure software or get an access to the Settings menu of AutoGRAPH-INFO-TFT which contains main operation configuration of the device.

When you try to open the Settings menu, the device requests password (Fig.28).

Fig.28. Password request.
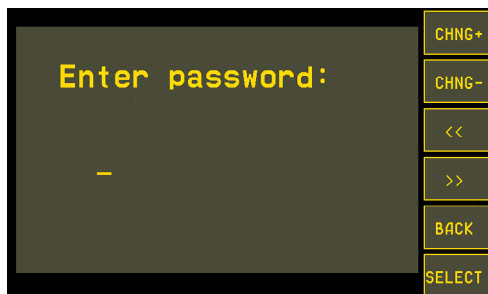
To enter password:

• select first character of the password using the CHNG+ and CHNG- buttons;

• as the first character is entered, press the button ">>" to go to the second character. If you need to edit a character that is already entered, use the button "<<" to return the cursor to that character position.

• enter other characters of the device password in a similar way;

• as the password has been entered completely, press the SELECT button. If the password is correct, you will get an access to the Settings menu. Otherwise, the device will inform you about incorrect password and return to the main menu.

Default password of AutoGRAPH-INFO-TFT that is set by the manufacturer is «0000». It is highly recommended to change default password to more reliable one in order to prevent unauthorized access to the device settings.

To change the device password:

• select Main menu/Settings/Change password. To access the Settings menu, enter the device current password (Fig.29);

• in the New password line, enter a new password in the same way as you enter password to access to the Settings menu (see above). The password can be from 4 to 8 characters long and contain figures from 0 to 9 and uppercase letters of Latin alphabet. The password characters are to be entered one by one. To select a character value from the list of available symbols, press the CHNG+ and CHNG- buttons until the required symbol is entered. To move to next character, press the button ">>". To return to previous character, press the button "<<". To apply the password, press the SELECT button;
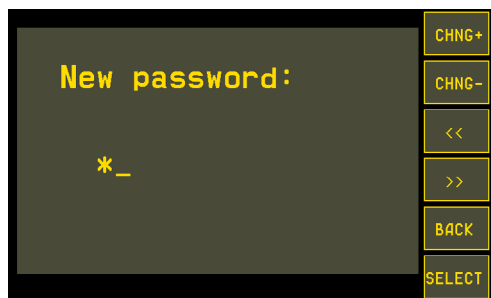

Fig.29. New password setup.

Voice communication

AutoGRAPH-INFO-TFT provides voice communication function intended for a driver to communicate with passengers.

AutoGRAPH-INFO-TFT is equipped with the 4-pin audio connector intended to connect PTT switch, which is supplied with the display.

When driver presses the Answer/Call button on the PTT switch, the display turns on the loudspeaker amplifier and the communication becomes available.

During the communication the sound level can be adjusted by changing the distance to the microphone.

In addition to voice communication initiated by driver, AutoGRAPH-INFO-TFT also provides automatic voice announcement of public transport stops and other preset advertisements in the Auto informer mode. The automatic announcements can be interrupted by voice messages transferred by driver. If the automatic announcement is interrupted that way, its playback is not continued after finishing the driver's message.

Alarm signal

In an emergency you can send alarm signal to a dispatcher. To do it, press simultaneously the CANCEL and ENTER buttons on the device front panel and hold the buttons until the alarm sound (3 short, 3 long then 3 short beeps). After that AutoGRAPH-INFO-TFT will send the message "SOS!!!" with the current position coordinates.

Photo cameras connection

AutoGRAPH-INFO-TFT supports connection of up to 16 photo cameras in order to get visual information on a vehicle operation.

All cameras must be connected to RS-485-2 bus of AutoGRAPH-INFO-TFT.

The current version of AutoGRAPH-INFO-TFT firmware supports operation with the ZM-CAM Series photo cameras by Shenszhen Quick Zoom Technology Co., Ltd (www.zmvideo.com). The cameras of this series record photos in JPEG format and are equipped with the infrared lighting and serial RS-485 bus providing 115200 bit/s baudrate.

The cameras require operating voltage within the range 9...30 V.

Shown on Fig.31 are the different design versions of the ZM-CAM Series cameras.

Fig.30. The ZM-CAM Series cameras.

Starting with the firmware of version AGDS-04.09, AutoGRAPH-INFO-TFT supports operation with photo cameras by Shenszhen Quick Zoom Technology Co., Ltd providing 1.3 megapixels resolution. The instruction on how to set up AutoGRAPH-INFO-TFT to receive photos from that type of cameras is given below.

Connection diagram of photo cameras

The cameras must be connected to the RS-485-2 bus of AutoGRAPH-INFO-TFT which is arranged on the 6-pin RS-485 interface connector: pin 10 is A line, pin 13 is B line.
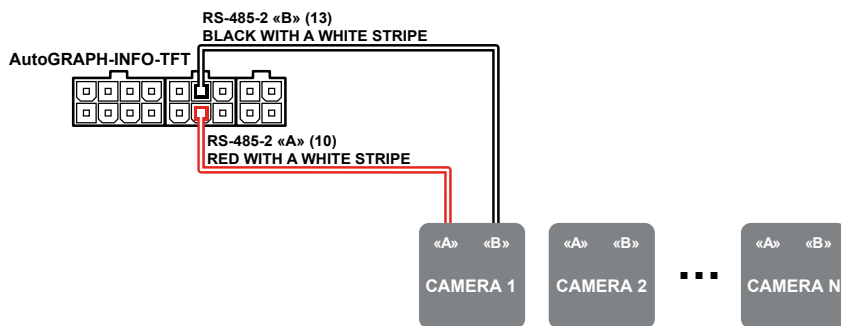

Fig.32. Connection diagram for photo cameras.

All cameras must be connected to AutoGRAPH-INFO-TFT by means of the CAM-splitter produced by TechnoKom Ltd. and intended for photo cameras supporting JPEG format.

Configure AutoGRAPH-INFO-TFT to operate with photo cameras

For proper operation of AutoGRAPH-INFO-TFT with photo cameras, it must be correctly configured using the DisplayConfigure software.

To configure AutoGRAPH-INFO-TFT to operate with photo cameras:

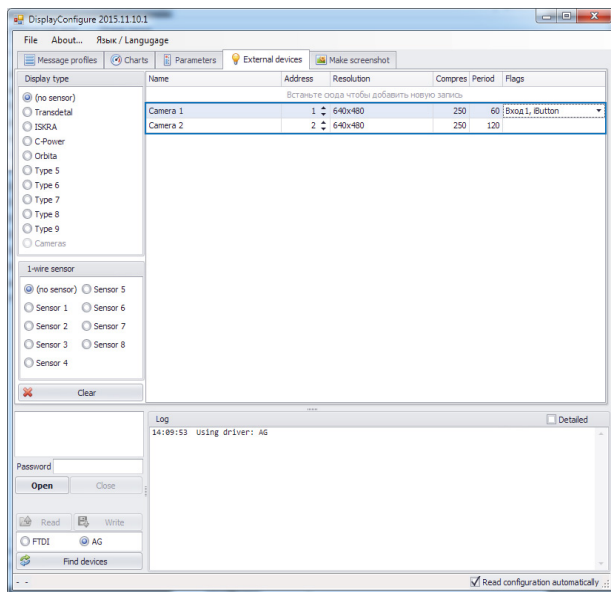• open the DisplayConfigure software and go to the External devices tab;

Fig.31. Cameras set up in the DisplayConfigure software.

• all cameras connected to the display and their settings must be specified in the table on the tab. To add a new camera, click the empty row at the top of the table, then specify following settings according the technical characteristics on the camera:

Name – the camera name. The name can be up to 20 characters long and is displayed in AutoGRAPH-INFO-TFT to identify the camera;

Address – a network address of the camera;

Resolution – camera resolution. You need to select a resolution from the drop-down list of available values.

Compression – JPEG compression rate. Minimum value is 20, maximum value is 250. The higher the compression rate, the smaller a photo size.

> **IMPORTANT**
>
> *For photo cameras with 1.3 megapixels resolution the compression must not exceed 90. The recommended values – from 20 to 90.*

Period – a period of automatic photo recording. Minimum value is 15, maximum value is 65000, 0 period disables periodic recording of photos from the camera.

> **IMPORTANT**
>
> *While setting cameras, pay special attention to the limitation that the period of automatic photo recording must not be smaller than the time interval taken to read a photo from camera, e.g. this parameter can amount up 10 seconds for the high quality coloured photo with VGA resolution.*

> **IMPORTANT**
>
> *Also it should be taken into account that AutoGRAPH-INFO-TFT records photos from cameras sequentially, that's why the record of next photo can be delayed by processing the previous photo from RS-485 bus.*

Flags – select events initiating extra photo recording in the drop-down list. This list contains events of the AutoGRAPH onboard controller:

• **Input 1-Input 8** – enables extra photo record when the selected digital inputs of the AutoGRAPH controller trigger.

• **iButton** – enables extra photo record by iButton registration.

• **Event 10** – enables extra photo record by triggering the high-impedance digital input of AutoGRAPH-INFO-TFT (pin 5 on the Power connector), when the input switches from logical 0 level to logical 1 level.

• **Event 11** – enables extra photo record by triggering the high-impedance digital input of AutoGRAPH-INFO-TFT (pin 5 on the Power connector), when the input switches from logical 1 level to logical 0 level.

• **Event 12-Event 16** – reserved.

> **IMPORTANT**
>
> *To provide automatic photo recording by the AutoGRAPH controller digital input triggering, it is not sufficient to set up AutoGRAPH-INFO-TFT. You also need to enable data transmission via RS-485 bus by the input triggering in the AutoGRAPH controller for the digital input that is used. This option can be set up using the AG.GSMConf software intended to configure AutoGRAPH onboard controllers. To set up the controller's digital inputs, you need to go to the Inputs tab of the AG.GSMConf software.*

• as all cameras specified, save the settings.

Change camera address in AutoGRAPH-INFO-TFT

To simplify cameras installation on a vehicle or their replacement, you can change cameras hardware addresses using AutoGRAPH-INFO-TFT. This avoids the necessity for cameras reconfiguration and allows using the range of addresses that has been already sent in AutoGRAPH-INFO-TFT.

To change a camera hardware address:

• disconnect all cameras from AutoGRAPH-INFO-TFT;

• turn on AutoGRAPH-INFO-TFT and select *Main menu/Settings/Camera/Change cam. address* (Fig.33);

• connect only one camera to the display and select its address using the buttons "<<" and ">>". Name of connected camera and the selected address are shown on the display;

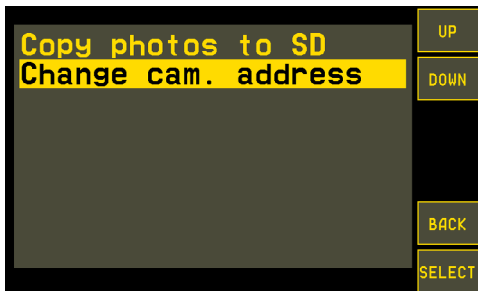• as address is selected, press the SAVE button.

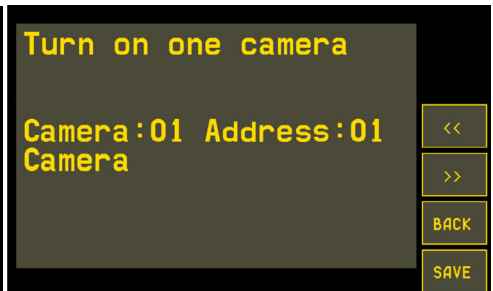Fig.33. Change of camera address.   Fig.34. Setup of camera address.

> **IMPORTANT**
>
> *It is highly important that only one camera is connected to AutoGRAPH-INFO-TFT when you change its hardware address. Otherwise correct setup of the address is not available.*

Photo recording

AutoGRAPH-INFO-TFT scans cameras every five minutes. If at least one camera is failed, the display notifies a user using sound signal then records a log. Therefore, if AutoGRAPH-INFO-TFT produces a long beep every 5 minutes, it is highly recommended to check connected cameras for integrity.

AutoGRAPH-INFO-TFT records photos from cameras with a regular period if it is specified or by preset events.

Also the forced record of photo can be made by the command from the AutoGRAPH 5 PRO Dispatch Software. The Dispatch Software also allows request of photos from the display memory card.

All photos are stored on SD card inserted in AutoGRAPH-INFO-TFT in the following directory – *\YEAR\MONTH\DAY*, e.g. the photo *AGDS_0100107_01_120416_102540_00009.jpg* in the directory *\\Year_2015\\Mon_04\\Date_16* was taken on the 16th of April in 2015 at 10:25:40, the display serial number is 100107, address of camera recorded the photo is 1, the photo number is 9.

Apart from that 1,5 MB of internal FLASH-memory of AutoGRAPH-INFO-TFT is dedicated to store recent photos to allow their recovery in case of damage of them on the SD card. A number of photos recorded in FLASH-memory depends of their size. If the dedicated memory is full, a new photo will be recorded instead of the oldest one providing that the most up-to-date data is always available.

As necessary, photos from FLASH memory can be copied to the display SD card. To do it, select *Main menu/Settings/Camera/Copy photos to SD* in the display. This will copy all photos from the device FLASH memory to the directory *\FLASH_120416* on the SD card (the "150416" is a date of the copying).
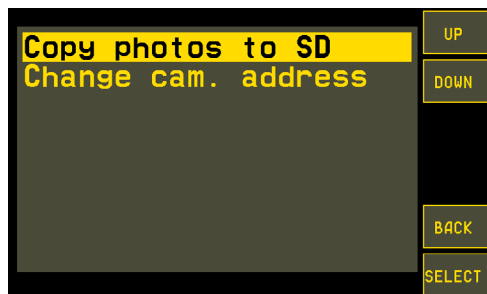

Fig.35. Copy photos from FLASH memory.

During the copying which can take a few tens of seconds AutoGRAPH-INFO-TFT produces sound. It is not recommended to remove the device SD card during the copying.

In order to remove photos from the device SD card, a complete formatting of the memory card is required. To format the SD card select *Main menu/Settings/SD card manager/Format SD* (Fig.35).
This will delete all data as well as photos from the device SD card.

Fig.36. Format SD card.

Connection of AutoGRAPH controller and fuel level sensors.

RS-485-3 bus of AutoGRAPH-INFO-TFT is intended for connection of LLS sensors and the AutoGRAPH onboard controller.

AutoGRAPH-INFO-TFT supports operation with following AutoGRAPH controller: AutoGRAPH-GSM, AutoGRAPH-GSM+, AutoGRAPH-SL, AutoGRAPH-WiFi+GSM, AutoGRAPH-WiFi.

Connection to the AutoGRAPH controller allows AutoGRAPH-INFO-TFT to receive position data, send text messages to a dispatcher and receive messages and files from data server.

Also AutoGRAPH-INFO-TFT supports connection of LLS sensors to RS-485-3 bus, e.g. fuel level sensors.

Connected to the AutoGRAPH controller or equipped with LLS sensors AutoGRAPH-INFO-TFT can be set up to display data from RS-485-3 on the main screen.

For proper operation of AutoGRAPH-INFO-TFT with external devices via RS-485-3, you need:

• Connect external device to RS-485-3 of AutoGRAPH-INFO-TFT according to the connection diagrams given below.

• Set up RS-485-3 of AutoGRAPH-INFO-TFT for interfacing with connected device.

• Set correct main screen mode of AutoGRAPH-INFO-TFT in order for the device to display data from RS-485-3 bus on the screen. This option can be set in the Main screen menu (for detailed information, see the section "Main screen" of this User Manual).

• also specify in AutoGRAPH-INFO-TFT a list of parameters which must be displayed on the main screen. Use the DisplayConfigure software to create a list of parameters for display and save it in AutoGRAPH-INFO-TFT. Detailed information on how to create the list of parameters is given in the section "Main screen" of this User Manual. The full list of supported parameters is given in the Appendix 3.

AutoGRAPH controller connection diagram

AutoGRAPH-INFO-TFT must be connected to RS-485 Bus of the AutoGRAPH controller. If the controller is equipped with double RS-485 bus, the display must be connected to RS-485-1 Bus of the controller. To make the connection, join pin 11 (line A) and pin 14 (line B) on the 6-pin RS-485 interface connector of AutoGRAPH-INFO-TFT respectively to Line A and Line B of RS-485 (RS-485-1) of the controller.
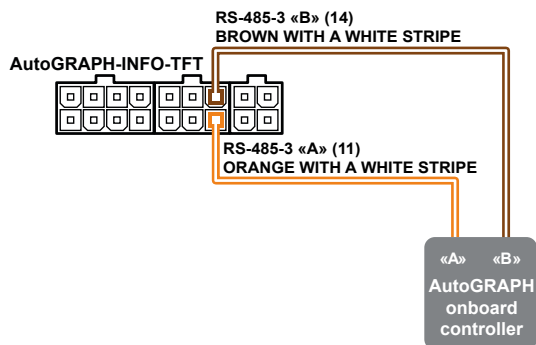

Fig.37. Connection to AutoGRAPH controller.

Sensors connection diagram

RS-485-3 of AutoGRAPH-INFO-TFT allows connection of up to 8 LLS sensors with network addresses within the range 1...8. If the connected sensor has address that is out of the required range, this sensor won't be scanned by AutoGRAPH-INFO-TFT. Due to this all sensors must be properly configured before connection to the display.

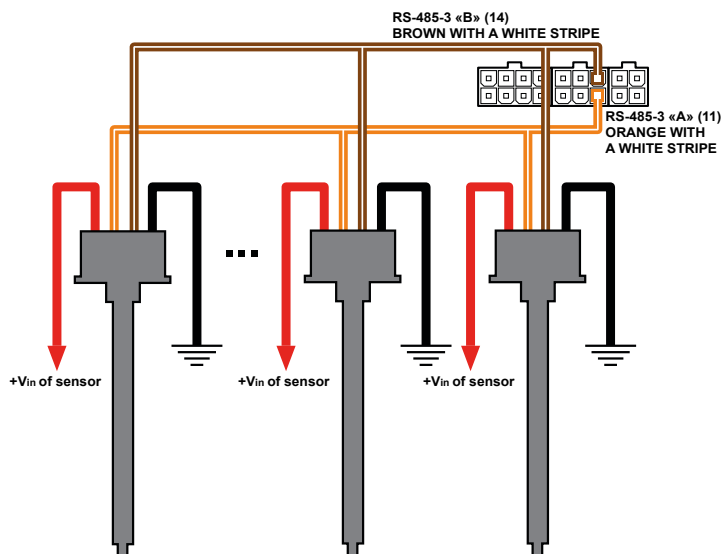Given below is the diagram of connecting the fuel level sensors to AutoGRAPH-INFO-TFT.

Fig.38. Connection of fuel level sensors.

> **IMPORTANT**
>
> *All connections should be made when the AutoGRAPH-INFO-TFT and all external devices to be connected to the RS-485 bus are disconnected from power supply.*
>
> *Be careful not to cross the «A» and «B» wires, otherwise the device connected to the AutoGRAPH-INFO-TFT may operate incorrectly.*

RS-485-3 set up

RS-485-3 mode

After making a connection to RS-485-3 bus, you need to set up the mode of RS-485 bus. To do it, select *Main menu/Settings/Control menu/Mode of RS-485-3/Operation mode*.
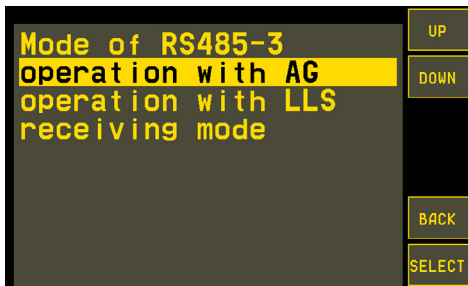
Fig.39. Mode of RS-485-3 bus.

RS-485-3 can operate in one of the following modes (Fig.39):

• **operation with AG** – this mode must be enabled if the AutoGRAPH onboard controller is connected to AutoGRAPH-INFO-TFT (via RS-485-3 bus). In this mode the display also receives data from different sensors connected to the AutoGRAPH controller.

• **operation with LLS** – this mode must be enabled if AutoGRAPH-INFO-TFT is not connected to the AutoGRAPH controller. This mode enables data reception from LLS sensor, as well as fuel level sensors connected to RS-485-3 bus of AutoGRAPH-INFO-TFT.

• **receiving mode** – this mode enables data reception from RS-485-3 bus and disables data transmission to the bus. In this mode AutoGRAPH-INFO-TFT only receives data available on the bus. The receiving mode can be used by one of the AutoGRAPH-INFO devices connected to the AutoGRAPH controller providing reception and display of that data which is sent by the controller to other AutoGRAPH-INFO which common RS-485 bus is tuned to the mode "operation with AG".

RS-485-3 baudrate

RS-485-3 bus of AutoGRAPH-INFO-TFT must be set to the same baudrate as a baudrate of RS-485 bus of the AutoGRAPH controller which the display is connected to.

To set up the baudrate in the AutoGRAPH-INFO-TFT select *Main menu/Settings/Control menu/Mode of RS485-3/Baudrate*, then select a baudrate from the list of available (Fig.40).

It is not recommended to use a baudrate less than 115200 bit/s if AutoGRAPH-INFO-TFT downloads files from data server via the AutoGRAPH controller.
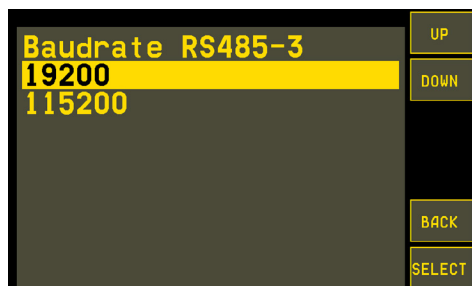
Fig.40. RS-485-3 baudrate.

Message handling

The AutoGRAPH-INFO-TFT allows a driver to send messages to data server those then become available for a dispatcher. Also the device can send a message to up to 3 preset telephone numbers. At the beginning of a message the device sends its current coordinates. It is available to sent only standard messages grouped according to their subjects.

Select messages profile

To set up a messages profile go to *Main menu/Settings/Message profile*, then select a profile (Fig.41)*.*

Following profiles are available: Dortransnavigatsiya, Police and Custom. All profiles, besides the Custom profile, are the special purpose profiles which are used in specific situations.

Fig.41. Message profile.

For general application it is recommended to use the Custom profile which contains user-defined messages. To add a new message in the profile, use the DisplayConfigure software. The custom profile can contain up to 6 different subjects with 8 messages in each of them.

NOTE

Detailed information on how edit message profile is given in paragraph «Create/Edit list of standard messages, standard replies, and phone numbers of recipients» of this section.

Send messages

To send a standard message, you need to select *Main menu/Messages*, then select «Send message» option (Fig.42).

Fig.42. Messages menu.

The AutoGRAPH-INFO-TFT will prompt you to select a topic of standard messages available in the preset profile (Fig.43), then – a message to send.

Fig.43. List of standard messages.

Before sending the message, select a recipient using the buttons "<<" and ">>" (Fig.44). Using the DisplayConfigure tool up to 4 recipients can be set up: a dispatcher and other responsible persons. When recipient is selected, press the SELECT button to transfer the message.

Fig.44. Message transmission.

As the message is transmitted, the status "Message is sent" is displayed on the screen.

Transmission of messages can be disabled by locking the function in the device settings. In this case the user will get a notification "Transmission is disabled" when trying to send a message (Fig.45). For more detailed information on how to lock or unlock the device functions see section "Lock device functions" of this document.

Fig.45. Message transmission is denied.

Using the "LEFT" and "RIGHT" buttons on the device front panel you can send respectively first and second messages of the current profile (besides the "Transnavigatsiya" profile). This feature is available only when the main screen is open.

Also when the Custom profile of messages is enabled you can send quick answer to dispatcher using the buttons "Yes" and "No" on the main screen (Fig.46).

Receive messages

AutoGRAPH-INFO-TFT is able to receive messages from data server via AutoGRAPH on-board controller. When the device receives a new message, the notification «SMS n» is displayed on the device main screen (n – a number of new messages), Fig.46. Furthermore, the device beeps once a minute.

Fig.46. Incoming message indication.

To read an incoming message, press the READ button on the lower right of the main screen which is displayed instead of MENU button when there is an unread incoming message.

When incoming message is open (Fig.47), you can scroll the message text using the UP and DOWN buttons.

Buttons "<<" and ">>" are intended to go respectively to previous and next incoming messages. The REPLY button is intended to create and send a reply to open incoming message. The BACK button goes to previous menu.
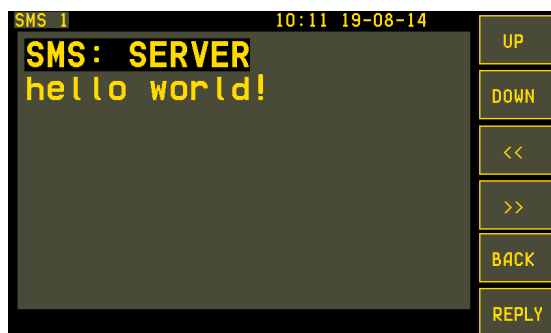
You can open the incoming messages menu also by selecting *Main menu/Messages/ Incoming messages*. AutoGRAPH-INFO-TFT can store up to 30 messages in memory using the ring buffer principle. It means that new message will be written over the oldest message first, ensuring that the most recent message is always available.

To send a message to AutoGRAPH-INFO-TFT, it is necessary to send the command DISPLAY=…; with the required text to AutoGRAPH on-board controller connected to the display. The command can be sent via data server or by means of SMS to a number of the SIM installed in the controller. After processing the command, the AutoGRAPH controller will send the message to AutoGRAPH-INFO-TFT via RS-485 bus.

IMPORTANT

Format of the command DISPLAY=; must match the format of remote control commands of the AutoGRAPH on-board controller. More detailed information on remote control commands is given in the document «AutoGRAPH-GSM. Server and SMS control commands».

Incoming messages can be removed from the AutoGRAPH-INFO-TFT. To do it, select *Main menu/Settings/Delete all messages*.

Create/Edit list of standard messages, standard replies, and phone numbers of recipients

This paragraphs covers the instruction on how to edit standard messages of AutoGRAPH-INFO-TFT.

To edit message profile, you need to connect AutoGRAPH-INFO-TFT to the DisplayConfigure software as described in the section "Configure AutoGRAPH-INFO-TFT". After reading the settings, device standard messages will be displayed on the «Messages profiles» tab grouped into three sections according to a profile. The Profile 1 and Profile 2 are not available in the English version of the DisplayConfigure.

Profile 3 (Custom profile) is fully configurable – you can add any subjects, messages, replies and recipients in the profile.

Described below is an example of custom profile editing:
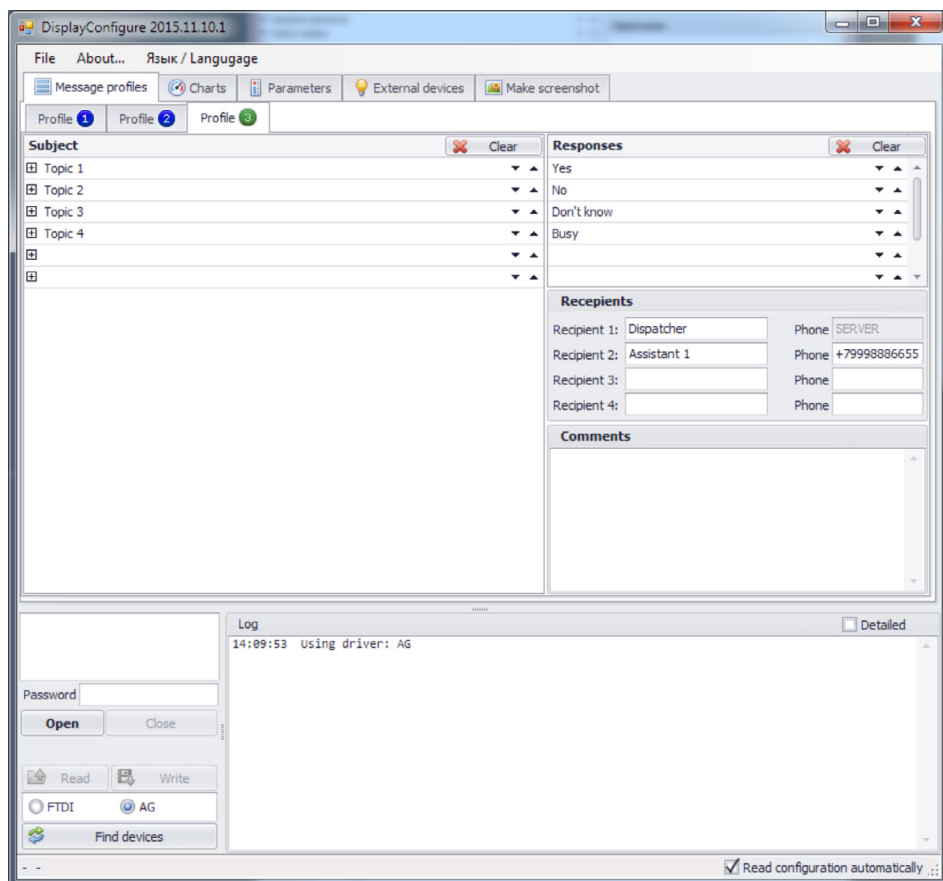
• Go to the Profile 3 tab (Fig.48).

Fig.48. Messages profiles.

• To edit messages stored in the AutoGRAPH-INFO-TFT, read settings from the device and continue editing. Or fill in empty template on the tab without reading the device settings to create a completely new profile.

• The Custom profile can contain up to 6 subjects with up to 8 messages in each of them (Fig.49).
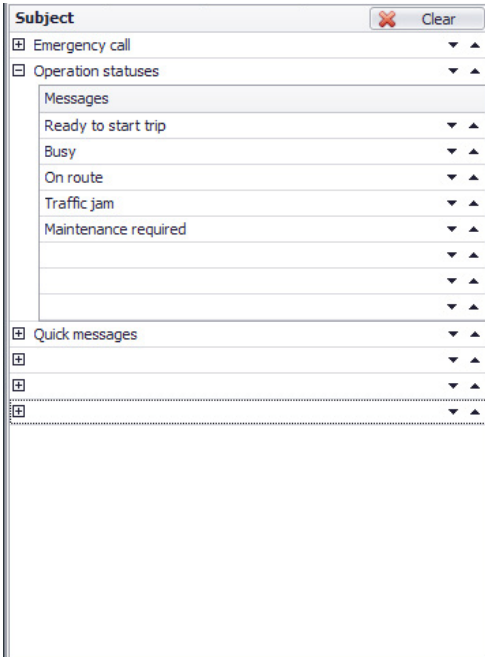
Fig.49. Standard messages.

To create a new subject, enter the subject description, e.g. in the Subject 1 field. Then enter texts of messages provided by the created profile. Unnecessary message fields must be remained empty as well as the fields of unnecessary subjects.
Use Up and Down button, to set up an order of messages in the device.

• The «Responses» panel (Fig.50) is intended to create a list of standard responses which a driver can use to send quick replies to a dispatcher.

Fig.50. Responses.

⚠ **IMPORTANT**   *The subject titles, text of messages and replies cannot exceed 22 characters.*

• The «Recipients» panel is intended to add recipients of AutoGRAPH-INFO messages (Fig.51). To add a new recipient, specify its name and a phone number. Format of the phone number is +7XXXXXXXXXX. Up to 3 different recipients can be specified (Recipient 2...4). The recipient 1 is non-configurable, besides the name, and used to send messages to the data server where they become available for the download to the AutoGRAPH Dispatch software.

Fig.51. Recipients.

NOTE

When entering a recipient phone number, the format _7XXXXXXXXXX is required. In the case of wrong format of the specified number, the error message pops up.

• After the profile setting up, enter the device password in the «Password» field and press «Write» button to save new settings in the device.

iButton keys

AutoGRAPH-INFO-TFT can be set up to display an iButton key holder name (e.g. a driver second name) and play a sound file when the key is read by the connected AutoGRAPH controller.

To enable this function, you need to:

• create a file DriversList.csv containing iButton key IDs and second name of persons holding these keys. The DriversList.csv can be created in the AutoGRAPH Dispatch Software of versions 3.5 or 4.0;

• copy this file in the \CarDrivers folder on AutoGRAPH-INFO-TFT SD card;

• prepare sound files which are to be played as appropriate iButton keys have been read. All files must be if the format of .mp3. To associate a sound file with an iButton key, name this file as the key number, e.g. 0000114D8182.mp3 is played when the key 0000114D8182 have been read;

• copy all sound files in the \CarDrivers folder on AutoGRAPH-INFO-TFT SD card;

The \CarDrivers folder with all necessary files can be copied on the device SD card manually or loaded from data server.

To send \CarDrivers folder to the display from data server:

• Prepare the CarDrivers folder – copy all required files in this folder.

• Copy the prepared CarDrivers folder in the directory \DevFiles\NNNNNNN\RS485 on the AutoGRAPH Server where the "NNNNNNN" is a serial number of the AutoGRAPH controller, which AutoGRAPH-INFO-TFT is connected to.

• All files stored in the \RS485 folder will be sent to the AutoGRAPH controller at next period of data transmission by the controller. Then the controller will transfer received files to AutoGRAPH-INFO-TFT via RS-485 bus. All files received by AutoGRAPH-INFO-TFT via RS-485 bus are stored in the \RS485 folder on the display SD card.

• As the \CarDrivers folder is loaded in the display, it must be moved from the \RS485 folder to root folder of the SD card by the server command. This will replace the old \CarDrivers folder in the root directory with a new one. After that the new files downloaded from the server become available for usage.

• To move the \CarDrivers folder from the \RS485 directory to root directory of SD card, you need to send the command DISPCOMMAND=DRIVERS_UPGRADE=; from server to the AutoGRAPH controller, which the display is connected to. For more detailed information see Appendix 3 of this User Manual.

Playback time of the sound file assigned for connected iButton key is limited and must not exceed 10 seconds. The iButton owner's second name is being displayed for 3 minutes.

If no sound file associated with the connected key is found, the display will play nothing. If there is the All_iButton.mp3 file on the \CarDrivers folder, it will be played for iButton keys without individual sound files. Sample of the All_iButton.mp3 file can be the sound message "Unknown driver".

If there is the Input_x.mp3 file in the \CarDrivers folder, where x denotes a number of the AutoGRAPH controller digital input, and the appropriate input of the controller is correctly configured, the display will play the file Input_x.mp3 when the associated input of the controller triggers. In case of simultaneous triggering of several inputs, that file is played which is associated with the input with the highest number.

Main screen mode

Main screen is intended to display vehicle operating parameters, received from the AutoGRAPH on-board controller, current time, fuel level sensor readings or other information preset by a user. By default current date and time are displayed on the main screen.

To select a parameter which will be displayed on the main screen of the device, go to *Main menu/Settings/Main screen* (Fig.52).
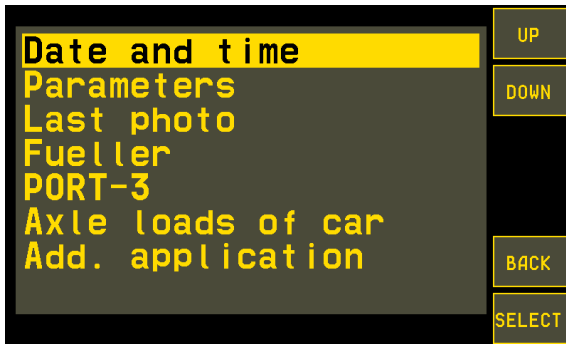
Fig.52. Main screen modes.

Date and time

This mode enables display of the current date and time on the device main screen. If the device is equipped with an internal real-time clock, the current time is always available. For the devices without an internal real-time clock, connection to the AutoGRAPH controller is required in order to display valid date and time on the main screen. For the devices with internal real-time clock the more priority time is that one which is received from the AutoGRAPH controller.

Parameters

This mode enables display of parameters received from AutoGRAPH on-board controller or LLS sensors connected to RS-485 bus of the display (Fig.53).

The list of parameters displayed on the main screen must be preset in AutoGRAPH-INFO-TFT using the DisplayConfigure software. Furthermore, this mode provides indication of readings in the form of a chart if the appropriate chart is preset in the device.
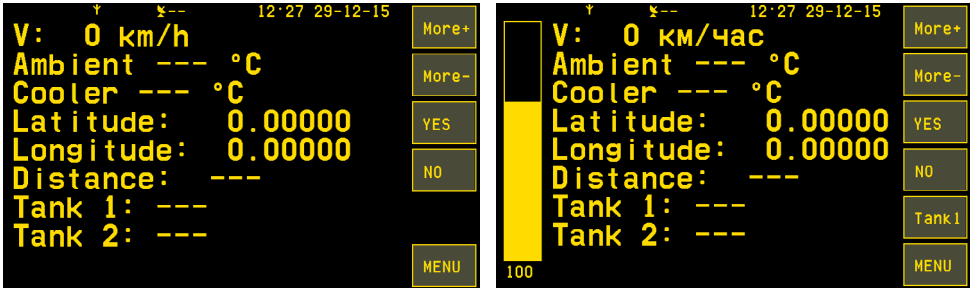
Fig.53. Parameters mode.

AutoGRAPH-INFO-TFT displays parameters on the main screen according the list which is specified using the DisplayConfigure software. Detailed information is given in the paragraph "Set up list of parameters" of this User Manual.

In addition to vehicle operation parameters AutoGRAPH-INFO-TFT can display readings of sensors, connected to the AutoGRAPH controller or directly to the informational display, e.g. fuel level, axle pressure, data from fuel dispenser, and etc.

In order to display level data, you need to set up charts in AutoGRAPH-INFO-TFT using the DisplayConfigure software. Detailed instruction on how to create charts is given in paragraph "Set up charts" of this sections.

If it is necessary to display numeric value of the level in addition to the chart, add this level parameter in the list of parameters displayed on the main screen of AutoGRAPH-INFO-TFT. Detailed information on how to create a list of parameters for the main screen is given in paragraph "Set up list of parameters" of this section.

The chart is display on the left of the main screen. To display next chart, press the "Tank n" button, where n denotes current chart number. You can also go to the next chart pressing the CANCEL button on the front panel of the device.
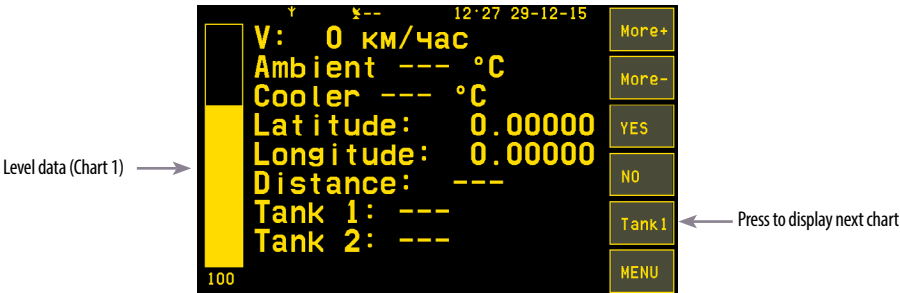

Level data (Chart 1) →

Press to display next chart

Fig.54. Charts.

Last photo

This mode is intended to display the last photo recorded by AutoGRAPH-INFO-TFT (Fig.55). Using the Photo+ and Photo- buttons you can view the last six photos.

Fig.55. The last photo on the main screen.

Fueller

This mode is intended to display data received from the AGFC fuel dispensing controller connected via RS-485 bus. The AGFC controller is a device produced by TechnoKom Ltd. and intended to control fuel dispensing at filling stations.

The data is received from the AGFC controller connected to the AutoGRAPH on-board controller. Totally up to 8 AGFC devices can be connected to the AutoGRAPH controller.

Readings from available AGFC devices are displayed in separate lines on the main screen. The first line contains readings of the AGFC device with an address D0, the second line contains readings of the device with and address D1, and etc.

If there is no data from the AGFC, zero value is displayed. As new data from the AGFC becomes available, at first a driver ID is displayed, then the fuel volume which is being filled by the driver is indicated (Fig.56). At the end of the filling, total volume of filled fuel (in liters) and the filling duration (in seconds) are displayed. The last filling report have been displayed until next filling.

Fig.56. Readings of AGFC devices

PORT-3

This mode is intended to display data received from a fueller via RS-485. The data is received from the fueller connected to the AutoGRAPH on-board controller. It can be the AGFC fuel dispensing controller (produced by TechnoKom Ltd.) with the address F9 or other device, e.g. the PORT-3 device. This mode can be used to display data from the AGFC device if only one AGFC is connected to the AutoGRAPH on-board controller and it is network address is F9.

If there is no data from the fueller, the message «Waiting for filling» is displayed. As new data from the fueller becomes available, it is displayed on the main screen. At the beginning of filling the message "Start filling" is displayed. At the end of the filling the report including total volume of fuel (in liters) dispensed by the fueller and the filling duration (e.g. T: 32 sec) is displayed.

Fig.57. PORT-3 readings.

Axle load of car

This mode is intended to display vehicle axle load on the main screen. This data is received from RS-485-3 bus in LLS protocol and can be provided by pressure sensors directly connected to the display or to the AutoGRAPH controller.

If pressure sensors are connected to the AutoGRAPH controller, RS-485-3 bus of AutoGRAPH-INFO-TFT must be set up to the "operation with AG" mode.

If pressure sensors are connected directly to AutoGRAPH-INFO-TFT, RS-485-3 bus of the display must be set up to the "operation with LLS" mode.
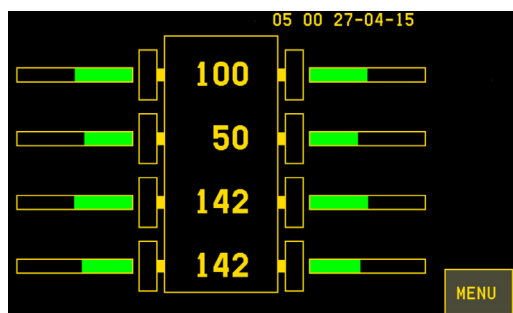

Fig.58. Axle load.

Axel load data is displayed in the form of a diagram (Fig.58). Therefore, you need to set up charts in AutoGRAPH-INFO-TFT using the DisplayConfigure software to display axle load on the main screen of the device. Up to 4 charts (axles) displaying readings from two pressure sensors can be set up, i.e. in total up to 8 sensors can be connected to AutoGRAPH-INFO-TFT (via the AutoGRAPH controller or directly). Connected pressure sensors must have addresses within the range 1...8:

• sensors with the addresses 1 and 2 must be installed on the axle 1 (chart 1 in the DisplayConfigure software);

• sensors with the addresses 3 and 4 must be installed on the axle 2 (chart 2 in the DisplayConfigure software);

• sensors with the addresses 5 and 6 must be installed on the axle 3 (chart 3 in the DisplayConfigure software);

• sensors with the addresses 7 and 8 must be installed on the axle 4 (chart 4 in the DisplayConfigure software);

All sensors which are not used must be disabled.

In order to configure correctly the charts to display axle load, follow the recommendations given below:

• to disable a chart (axle), set it maximum value equal to 0;

• if a chart divisor is 1, AutoGRAPH-INFO-TFT displays sum of two pressure sensors readings on an axle;

• if a chart divisor is 2, AutoGRAPH-INFO-TFT displays average value of two pressure sensors readings on an axle;

• to display a high load notification on the main screen set the notification level for a chart (in %). This will provide that the chart (axle) is highlighted red if axle load reaches the notification level, yellow if axle load is 20% less then the notification level, and green if axle load is within a normal range. The notification level is applied to a whole axle and displayed for each sensor on it.

> **NOTE** *Detailed instruction on setting the charts for axle load display is given in the paragraph "Set up charts" of this section.*

In addition to axle load, other data from RS-485-3 bus can be displayed on the main screen in this mode. For that end, add all required data in the list of parameters displayed on the main screen using the DisplayConfigure software.

> **NOTE** *It is recommended to use the GNOM DDE pressure sensors produced by Technoton in combination with AutoGRAPH-INFO-TFT to monitor axle load.*

> **NOTE** *Pressure sensors are connected to AutoGRAPH-INFO-TFT by means of the TKMS adapter produced by TechnoKom Ltd. One TKMS adapter allows connection of two pressure sensors to AutoGRAPH-INFO-TFT.*

Add. application

This mode is intended to display user-defined information on the main screen. In order to display the required information, contact a technical support specialist of TechnoKom Ltd. regarding the integration of this information into the device firmware.

Set up list of parameters

AutoGRAPH-INFO-TFT displays parameters on the main screen according the list which has been specified on the Parameters tab of the DisplayConfigure software.
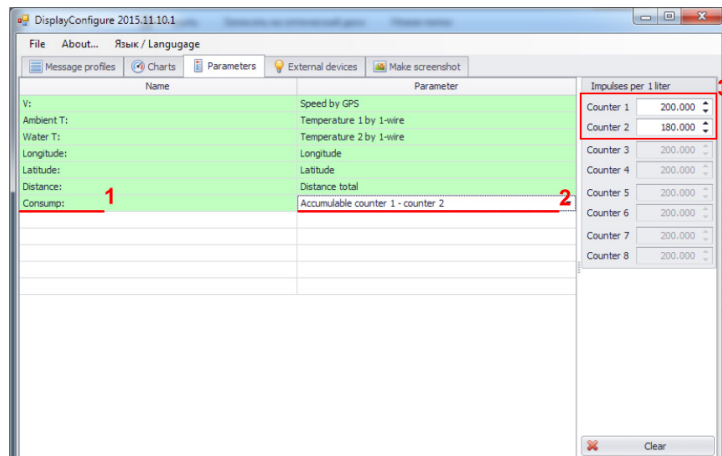

Fig.59. Parameters tab.

To set up list of parameters:

• enter a parameter description in the «Name» field (Fig.59, i.1) which will be displayed before the parameter value. A number of characters in the name can not exceed 10. If the «Name» field is empty, only the parameter value is displayed;

• in the «Parameter» field, select a parameter to display (Fig.59, i.2). Full list of supported parameters and their descriptions are given in the Appendix 3 to this document.

• for the Accumulable counters, which are used to indicate readings of flow meters connected to the AutoGRAPH controller's digital inputs, you also need to set up impulses per 1 liter on left panel (Fig.59, i.3) in order to convert a number of pulses to liters.

When specifying parameters, you should note that the AutoGRAPH-INFO-TFT displays parameters from that list till the first empty string. The parameters after the empty string are not displayed.

If a chart is displayed on the first screen, specify the parameters for the first screen in the manner that they fit in the rest of string length.

AutoGRAPH-INFO-TFT receives data from LLS sensors or the AutoGRAPH on-board controller connected to RS-485 bus and displays parameters according to the specified list on the main screen if they are available. If specified parameter is not available, the string «---» is displayed instead of the parameter value.

The AutoGRAPH-INFO-TFT supports up to 2 screens and up to 12 parameters in total.

The first screen contains top eight parameters specified on the Parameters tab, the second screen contains the rest of parameters. To go to the next screen, use the "More+" button. To return to the previous screen, use the "More-" button on the device main screen.

Set up charts

Some modes of the device main screen support display of level data in the form of a chart. e.g. fuel level, axle load and etc.

To display level data as a chart, you need to set up the chart on the Charts tab of the DisplayConfigure software.

It is available to add up to 4 charts on the device main screen.

Given below is an instruction on how to set up charts. The instruction is given as an example of the Chart 1 and is applicable for other charts.
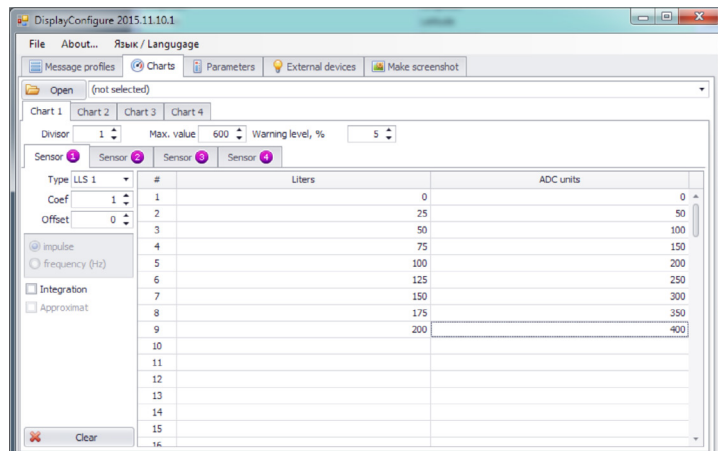

Fig.60. Charts tab.

To set up the Chart 1, go to the Chart 1 tab and set up following options:

• **Maximum value** is a maximum value, which can be displayed on the chart. Zero value disables the chart.

• **Warning level** is a minimum value enabling the low level notification. The warning level must be specified as % of chart maximum value.

• **Sensor 1 (2..4)** is a sensor, connected directly to AutoGRAPH-INFO-TFT via RS-485 or to the AutoGRAPH on-board controller interfacing with the display, which readings will be indicated on the chart. The final value displayed on the chart can be calculated on the basis of up to 4 sensors readings according to a formula: (Sensor 1+ Sensor 2+ Sensor 3+ Sensor 4)/divisor, where the divisor is an coefficient from 1 to 4 specified in the «Divisor» field. The sensors must be configured in that order as their settings specified in the DisplayConfigure application, i.e. if only one sensor is used, it must be set up on the Sensor 1 tab, and if two sensors are used, they must be set up on the Sensor 1 and Sensor 2 tabs and etc.

NOTE

The divisor must be selected depending on the tank configuration and sensors position in the tank. Detailed information on how to select a divisor for fuel level sensors is given in the Appendix 1. The recommendation on how to select a divisor for axle load sensors is given in the paragraph "Axle load of car" of this section (see above).

In order to use a sensor, it must be correctly configured. To configure the sensor:

• in the field «Type», select readings to indicate on the configured chart. AutoGRAPH-INFO-TFT supports direct operation with only LLS sensors. So that, to display readings of the sensors connected to the AutoGRAPH-INFO-TFT, you need to select the required LLS sensor in the drop-down list (LLS1-LLS4).

Other parameters specified in the list are readings, which can be received from the AutoGRAPH on-board controller and external devices connected to the controller as well as LLS sensors connected to the controller (LLS1-LLS4). If you select Cntr1-Cntr8, you need also to set up a mode of the counter output mode – impulse or frequency (in Hz). If the frequency mode is selected, the counter reading is divided into 100, then specified offset is subtracted from that value. The final value of the sensor is calculated according to calibration table (see below).

• set up an offset (Offset) and coefficient (Coeff) for the selected sensor type;

• specify a calibration table to convert the sensor readings from ADC stages to liters. The sensor readings must be specified in the ascending order. The calibration table can contain up to 100 pair of values. If the table contains less than 100 values, all fields of excessive rows must be empty.

• select a method of calibration table approximation in the "Approximation» field.

• As the required charts have been configured, save setting in the AutoGRAPH-INFO-TFT. To do it, you need to enter the device password in the «Password» field, then apply settings pressing the «Write» button.

Event log

AutoGRAPH-INFO-TFT records information about significant system events in internal FLASH-memory. In total the device can record up to 9999 entries in a ring buffer principle.
To view the Event log, select *Main menu/Settings/Event logs/Browse logs*. Then use UP and DOWN buttons to scroll the log file (Fig.61). Description of device events are given in the Appendix 2.
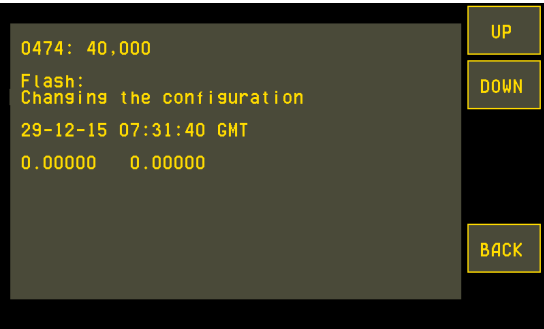
Fig.61. Event log.

The Event log can be copied from FLASH-memory to SD card. To do it, select *Main menu/ Settings/Event logs/Copy to SD.* This will copy all Event log content from FLASH-memory to the \LOG folder on SD card. The log is stored in the file Log_120416_110416.log, where 120516 is a date of the log file creation on SD card (the format is YYMMDD), 110416 is a time of the log file creation.

Duration of the log file copying depends of the file size and the sound notification is produced along the process.

Sample content of the log file copied from FLASH-memory is given below:

```
number: data       time      latitude     longitude    event
-----------------------------------------------------------------------------
00001: 12-05-12  13:51:04  55.17869N  61.35784E  20,001
00002: 12-05-12  13:49:58  55.17882N  61.35779E  10,001
00003: 12-05-12  13:49:50  55.17881N  61.35781E  10,001
00004: 12-05-12  13:48:18  55.17871N  61.35804E  20,001
00005: 12-05-12  13:47:20  55.17879N  61.35795E  20,001
```

SD card content and device configuration

On the device main screen select *Menu/Settings/SD card manager.* Access to the Settings menu is provided by the device password.
Using the commands in this menu, you can browse the SD card content, back up the device configuration and restore it.

Browse SD card content

To browse the device SD card content, select *Main menu/Settings/SD card manager/Browse SD* (Fig.62).
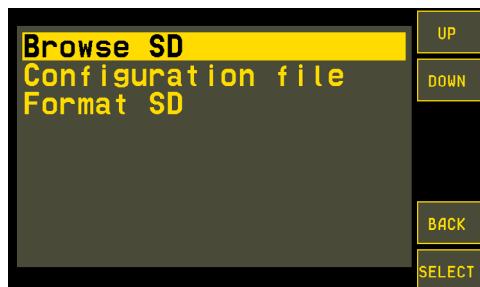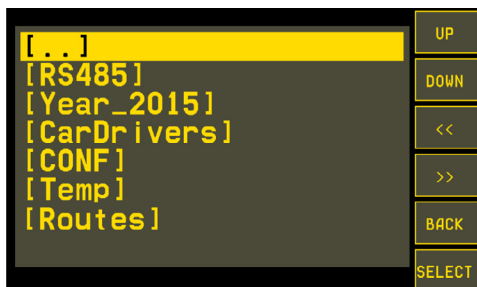

Fig.62. SD card options.

Fig.63. SD card content.

The device SD card is intended to store photos from connected cameras, different system and sound files required for the device proper operation.

Photos on the SD card are sorted to different folders according to a year, a month and a day when they were recorded.

To view a whole list of files on the SD card, use the UP and DOWN buttons (Fig.63). Use the buttons "<<" and ">>" to shift a file name in order to view a whole one if it is out of the screen.

To open a file, select it using the UP and DOWN buttons or by double tap, then press the SELECT button. If the format of selected file is supported by AutoGRAPH-INFO-TFT, it will be opened. Otherwise, the message "Unknown type" will be displayed on the lower left of the screen.

Configuration file

Configuration file is a file of the .dc format containing the settings specified by the DisplayConfigure software.

The configuration file created in the DisplayConfigure file can be loaded in the display and then unpacked in order to apply new settings.

To create a configuration file:

• specify required settings in the DisplayConfigure software;

• select *File menu/Save as* in the DisplayConfigure (Fig.64);

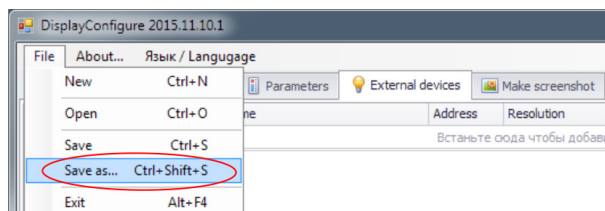• specify a new file name "ConfUpdate" and save the settings as the file of .dc format.

Fig.64. Save configuration file.

Load configuration file in AutoGRAPH-INFO-TFT

The ready file ConfUpdate.dc must be copied in the \Conf directory on the device SD card. The file can be copied to the required folder manually or loaded from data server via the AutoGRAPH controller, which the display is connected to.

To send the configuration file to AutoGRAPH-INFO-TFT via server:
• create the \Conf folder in local drive of your PC;

• copy ready ConfUpdate.dc file to that folder;

• copy the \Conf file with the configuration file in the \DevFiles\NNNNNNN\RS485 directory on the AutoGRAPH server. The "NNNNNNN" denotes the AutoGRAPH controller serial number connected to AutoGRAPH-INFO-TFT;

• next time when the AutoGRAPH controller connects to the server in order to transmit data, the folder \Conf will be transferred to the controller, then the controller will send it to AutoGRAPH-INFO-TFT via RS-485 bus;

• all files received by the display from RS-485 bus are stored in the \RS485 directory on the SD card. Therefore, after downloading the \Conf folder with the required configuration, it must be moved to root folder of the display SD card in order for the display to be able to use that configuration. To move the \Conf folder from the \RS485 directory to the root one, you need to send the command DISPCOMMAND=CONFIG_UPGRADE=; to the AutoGRAPH controller connected to the display from the server. Detailed information on how to send control commands to AutoGRAPH-INFO-TFT from data server is given in the Appendix 3 of this User Manual.

As the configuration file is loaded in AutoGRAPH-INFO-TFT and moved to the necessary directory, it can be read and applied to the display.

Read configuration file from SD card

To load the configuration stored in the \Conf folder on the device SD card, select *Main menu/ Settings/SD card manager/Configuration file/Read config. from SD* (Fig.65).
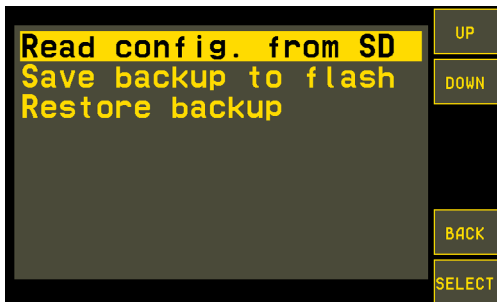

Fig.65. Configuration file reading.

If there is a ConfUpdate.dc in the \Conf folder, configuration from this file will be set in AutoGRAPH-INFO-TFT.

Back up device settings

All device settings, including settings from the DisplayConfigure software and the settings specified in the internal menus of the display, as well as personalization parameters, can be backed up in order to be able to restore them later in case of device configuration damage. The configuration backup is stored in the device FLASH-memory.

To back up the configuration, select *Main menu/Settings/SD card manager/Configuration/ Save backup to flash*. AutoGRAPH-INFO-TFT will save the current configuration in FLASH-memory and then display the message "Configuration saved" at the bottom of the screen.

Restore backup configuration

To restore the backed up settings, select *Main menu/Settings/SD card manager/Configuration/ Restore backup*.

The device settings backed up previously will be read from FLASH memory and restored, after that the AutoGRAPH-INFO-TFT will be restarted.

If back up file is not found, the message «Configuration copy not found» is displayed.

Format SD card

To format SD card of AutoGRAPH-INFO-TFT, select *Main menu/Settings/SD card manager/ Format SD.* This will start the complete formatting of the device SD card.

While the formatting the message "Formatting. Please wait..." is displayed. After finishing the formatting, the device will produce a beep, then it will be restarted.
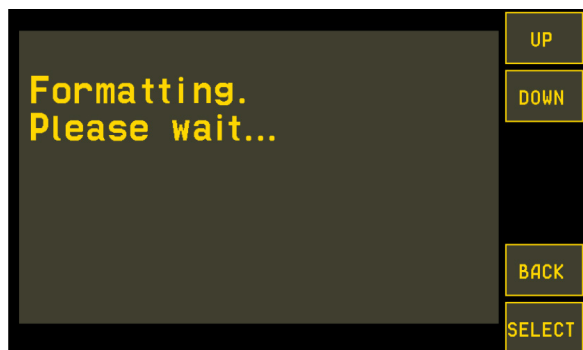

Fig.66. Format SD card.

AutoGRAPH-INFO-TFT operation control

You can control the device operation by managing its indication, limiting some functions, tuning operation modes of digital inputs and RS-485-3 bus in the Control menu. To go to this menu, select *Main menu/Settings/Control menu*.
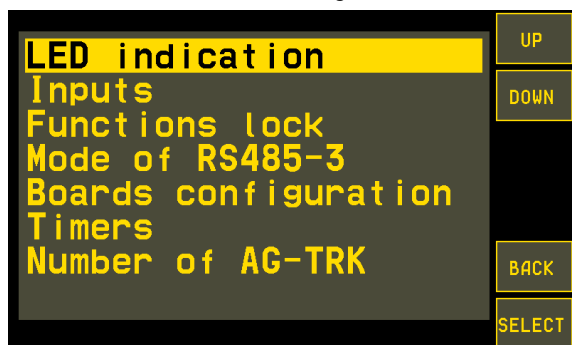

Fig.67. Control menu.

Manage device indication

Go to the LED indication menu to set up operation of the LED on the front panel of AutoGRAPH-INFO-TFT.

Following options are available in this menu (Fig.68):

• **Status bar** – enables status bar display at the top of the main screen. Operation statuses (GSM, navigation and Wi-Fi signals state) are received from the AutoGRAPH controller which AutoGRAPH-INFO-TFT is connected to.

• **Cam. record (green)** – enables indication of photo recording from a camera into the device SD card by means of the LED on the front panel. If the option is enabled, the LED turns green while the photo recording.

• **SD operation (red)** – enables indication of SD card operation by means of the LED on the front panel of AutoGRAPH-INFO-TFT. If the option is enabled, the LED flashes red while the SD card is in the use.

• **Reduce the brightness** – enables automatic reduce of the display brightness by 50% without activity longer than 20 seconds.
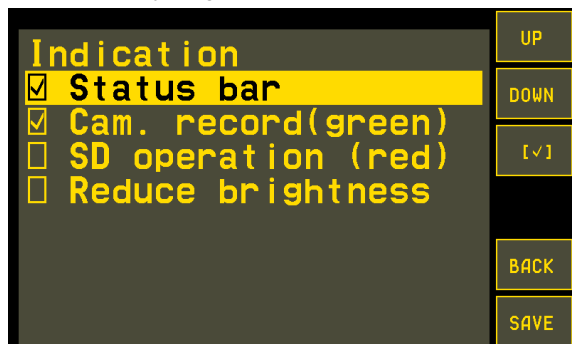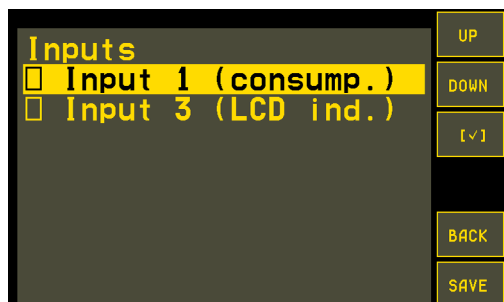

Fig.68. Device indication set up.

Set up mode of digital inputs

To set up the device digital inputs, select *Main menu/Settings/Control menu/Input*, then enable or disable special features of the inputs:

• **Input 1 (consump.)** – the option enables reset of accumulable consumption counters by pressing the button connected to the digital input 1.

• **Input 3 (LCD ind.)** – the option enables the AutoGRAPH-INFO-TFT display turning on by vehicle ignition start. To use this function, the digital input 3 must be connected to +Vin terminal of the ignition.

Fig.69. Mode of digital inputs.

IMPORTANT

When connecting digital inputs of AutoGRAPH-INFO-TFT, pay special attention to the logic of inputs operation. It is highly recommended to review connection diagrams of the digital inputs given in this User Manual before starting the connection procedures.

Lock device functions

In the Functions lock menu, you can disable some functions of AutoGRAPH-INFO-TFT.

Fig.70. Functions lock.

Given below is the list of AutoGRAPH-INFO-TFT functions available to be locked:

• **output messages** – disables sending of text messages from the AutoGRAPH-INFO-TFT. When this option is enabled, the notification «Transmission is disabled» is displayed when you try to send a message.

Fig.71. Message transmission is disabled.

• **time in GMT** – disable recording of any data (log entry, photo and etc.) in GMT. If the lock is enabled, the device records data in local time. By default this lock is disabled and AutoGRAPH-INFO-TFT records data in GMT.

Initialize internal timers

The AutoGRAPH-INFO-TFT has four internal timers intended to count time from preset events.

• **Timer 1** – is started by triggering the digital input 1 of AutoGRAPH-INFO-TFT.

• **Timer 2** – is started by triggering the digital input 2 of AutoGRAPH-INFO-TFT.

• **Timer 3** – is started by triggering the digital input 3 of AutoGRAPH-INFO-TFT.

• **Timer 4** – is started at first AutoGRAPH-INFO-TFT turning on and intended to count total operation time of the device.

Readings of the device timers are stored into the FLASH memory every minute.

To enable the device timers and set up start events, go to *Main menu/Settings/Control menu/ Timers/Installation* (Fig.72).
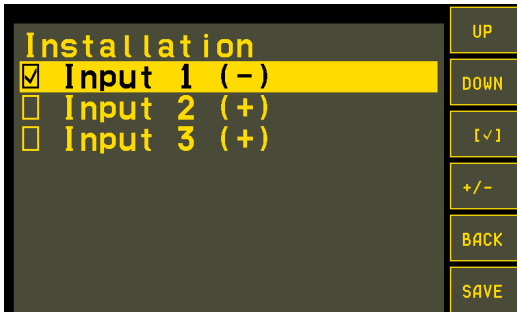

Fig.72. Timers set up.

You can set up a start event for all timers besides the Timer 4 which is started automatically at the first device turning on.
To enable a timer, select an input which triggering stars the timer, then press the button [✓] or double tap the selected input. As the timer is enabled, set a threshold of input triggering using the button +/- . If the threshold "-" is selected, the timer is started when the input is connected to ground, if the threshold "+" is selected, the timer is started when the input is connected to +Vin.

Timers 1-3 can be reset automatically every day. To enable the daily reset, select *Main menu/ Settings/Control menu/Timers/Daily reset*, then select an input associated with that timer, which automatic reset you need to enable, and use the button [✓] to enable or disable the option. If the daily reset is enabled for a timer, it is reset every day at 0:00:00 in GMT.
The Timer 4 can not be reset.

Fig.73. Daily reset of timers

Readings of the device timers can be displayed on the main screen in the «Parameters» mode. For this purpose, the timers can be added in the list of parameters displayed on the main screen. You can edit the list of parameters using the DisplayConfigure software (on the Parameters tab, Fig.74).
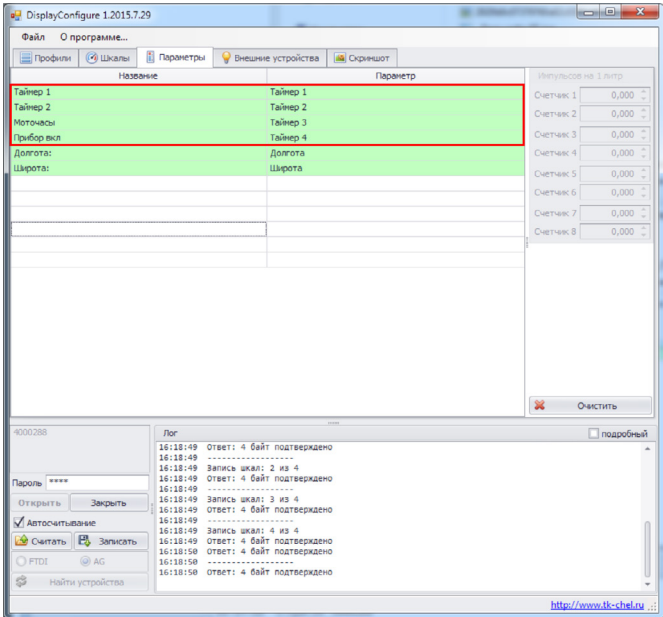

Fig.74. Add timers to list of parameters.

Timers 1-3 can be used to count a vehicle engine operation time, if the engine terminal contact is connected to the input activating an appropriate timer.

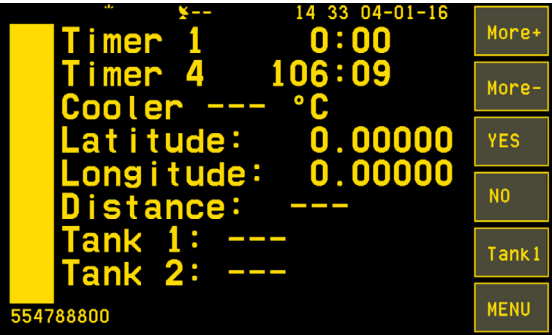The Fig.75 is a sample of the timers readings display on the main screen.

Fig.75. Timer readings.

Drivers installation

This section covers the procedure of installing the drivers of AutoGRAPH-INFO-TFT display – AGUSB Drivers for Microsoft Windows 7 OS.

The AutoGRAPH-INFO MINI drivers required for Windows 2000, XP, Server 2003, Vista, 7, 8, Server 2003, Server 2008 (x86 and x64) are free of charge and can be downloaded from the official website of TechnoKom: http://www.tk-chel.ru

To install the drivers onto Microsoft Windows 7 OS:

1. Connect the AutoGRAPH-INFO-TFT to PC using the Data-cable. The system will automatically search for new equipment (Fig.76). For proper operation, it is necessary to install drivers for both devices: AutoGRAPH and AutoGRAPH CDC device.

2. If the Internet connection is available, Windows 7 will automatically connect to the Windows Update website and install suitable driver for the display. If the Internet connection is not available, continue with the procedure outlined below.

3. Download the archived drivers folder from the official website of TechnoKom – AGUSBDriver.zip and extract files to a temporary directory on a hard drive.

4. Launch the driver update wizard and select «Browse my computer for driver software» to search for drivers manually. Then browse to the location where the drivers are saved (Fig.77).
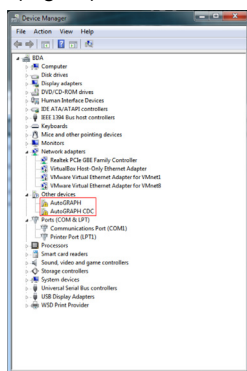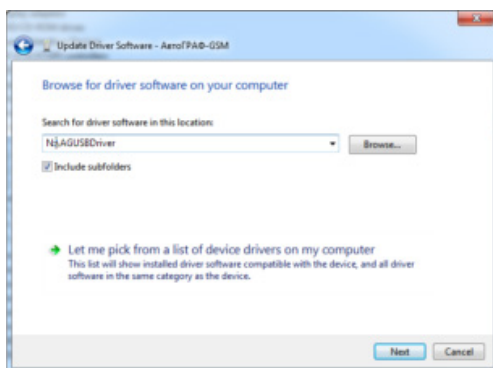

Fig.76. New equipment.

Fig.77. Browse for the driver folder.

5. Install the driver. When the driver is installed the system will automatically identify connected device (Fig.78).

6. Drivers for the AutoGRAPH-INFO are successfully installed. The device is ready to operate with troubleshooting utilities, dispatch software and other applications (Fig.79).
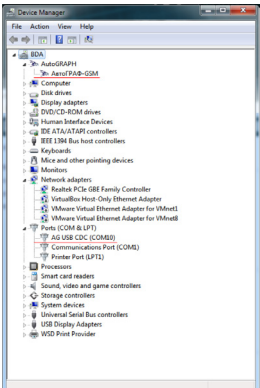
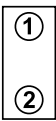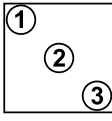Fig.78. Drivers have been installed.

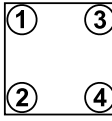Fig.79. Connected AutoGRAPH-INFO device.

Appendix 1

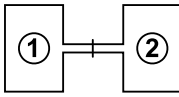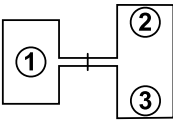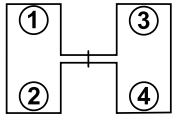## Variants of sensor installation in fuel tank

This section covers the information on how to set up the divisor which is used to calculate charts' readings. The divisor is to be selected depending on tank configuration and sensors position in the tank.
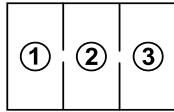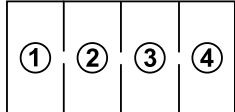
Given below is variants of LLS sensors installation on fuel tank depending on the tank type and methods of the divisor selection for each variants of the installation.

Top of the given formula is sum of the sensors readings. The figure at the bottom of formula is a coefficient (divisor) dividing the sum.

Given expressions and diagrams are applicable for other types of sensors.

	2 sensors in a tank	3 sensors in a tank	4 sensors in a tank
Sensor installation diagram			
Fuel level calculation formula	1: LLS1 2: LLS2 2	1: LLS1 2: LLS2 3: LLS3 3	1: LLS1 2: LLS2 3: LLS3 4: LLS4 4

	2 connecting tank, 2 sensors	2 connecting tank, 3 sensors	2 connecting tank, 4 sensors
Sensor installation diagram			
Fuel level calculation formula	1: LLS1 2: LLS2 1	1: LLS1 2: LLS1 3: LLS2 4: LLS3 2	1: LLS1 2: LLS2 3: LLS3 4: LLS4 2

	3 connecting tank, 3 sensors	4 connecting tank, 4 sensors
Sensor installation diagram		
Fuel level calculation formula	1: LLS1 2: LLS2 3: LLS3 1	1: LLS1 2: LLS2 3: LLS3 4: LLS2 1

Appendix 2

This section covers description of the device events which are recorded in the Event log. An event code consists of two field. The first field is an event type, the second field is description of the event.

Field 1	Field 2
Pressed buttons	010 – pressed "Yes" button to send the quick reply 011 – pressed "No" button to send the quick reply 100 – message buffer cleaned 101 – SD card formatted 102 – photos on FLASH memory copied to SD card 103 – device password changed 104 – accumulable consumption counters reset 105 – copying event log to SD card 200 – factory reset 201 – alarm button transmitted
2	000 – text message transmitted
3 – received text message	000 – reception report not required 001 – reception report required 002 – one of the specified variants required 099 – command to route update (ROUTE_UPGRADE) received
10 SD card	000 – SD card is removed 001– SD card is inserted
20 Photo	0XX – an address of the camera recorded the photo (222 – photo not recorded)
30 Stops	A number of the public transport stop 0XX – direct route stop, 1XX – return route stop
40 FLASH memory events	FLASH memory operation state: 000 – configuration is changed; 001 – restoring configuration from FLASH-memory; 002 – restoring parameters; 003 – restoring charts; 004 – restoring display boards settings; 005 – restoring message profiles; 006 – reading configuration from SD card; 007 – saving current configuration; 008 – restoring current configuration.
50 Server command	Server commands receiving reports: 000 – command reception error; 001 – received command to route list request – ROUTE_LIST; 002 – received command to update the route – ROUTE_WRITE; 003 – received command to delete the route – ROUTE_DELETE; 004 – received command to delete \Temp folder – DELETE_TEMP; 005 – received command to update all routes – ROUTE_UPGRADE; 10 – received command to device timer value request.

Appendix 3

Given below is the list of parameters which are supported by the AutoGRAPH-INFO-TFT and can be displayed on the device main screen. The list of parameters is set up in the DisplayConfigure application on the «Parameters» tab.

Parameters (in the order in which they are specified on the «Parameters» tab):

1. Speed by GPS.
2. Latitude.
3. Longitude.

Data from vehicle CAN bus
4. Speed from CAN bus.
5. Motohours from CAN bus.
6. Engine rotations from CAN bus.
7. Total distance from CAN bus.
8. Daily distance from CAN bus.
9. Oil temperature from CAN bus.
10. Coolant temperature.
11. Fuel temperature.

Fuel level from CAN bus
12. Total fuel level.
13. Fuel level in tank 1.
14. Fuel level in tank 2.
15. Fuel level in tank 3.
16. Fuel level in tank 4.
17. Fuel level in tank 5.
18. Fuel level in tank 6.

1-Wire data (temperature by 1-Wire sensors)
19. Readings of temperature sensor 1.
20. Readings of temperature sensor 2.
21. Readings of temperature sensor 3.
22. Readings of temperature sensor 4.
23. Readings of temperature sensor 5.
24. Readings of temperature sensor 6.
25. Readings of temperature sensor 7.
26. Readings of temperature sensor 8.

Fuel consumption (data from digital inputs which flow meters are connected to)
27. Accumulable counter 1.
28. Accumulable counter 2.
29. Accumulable counter 3.
30. Accumulable counter 4.
31. Accumulable counter 5.
32. Accumulable counter 6.
33. Accumulable counter 7.
34. Accumulable counter 8.
Two counters difference

35. Accumulable counter 1 – counter 2.
36. Accumulable counter 2 – counter 1.
37. Accumulable counter 3 – counter 4.
38. Accumulable counter 4 – counter 3.
39. Accumulable counter 5 – counter 6.
40. Accumulable counter 6 – counter 5.
41. Accumulable counter 7 – counter 8.
42. Accumulable counter 8 – counter 7.

Temperature by LLS sensors
43. Temperature by LLS 1.
44. Temperature by LLS 2.
45. Temperature by LLS 3.
46. Temperature by LLS 4.
47. Temperature by LLS 5.
48. Temperature by LLS 6.
49. Temperature by LLS 7.
50. Temperature by LLS 8.

Numerical value of charts
51. Chart 1.
52. Chart 2.
53. Chart 3.
54. Chart 4.

55. Current date.
56. Current time (local).

Timer readings
57. Timer 1.
58. Timer 2.
59. Timer 3.
60. Timer 4.

61. Firmware version of AutoGRAPH-INFO.

The Accumulable counters can be reset as necessary. To do it, press simultaneously the DOWN and the CANCEL buttons on the device front panel. You will be prompted to select a consumption parameter for reset. Use the "<<" and ">>" buttons to select a parameter, then press "Reset".

Also the accumulable counters can be reset by a button connected to the digital input 1 which is preset to the «Consumption reset» mode.
To edit the digital input mode, go to the Control men of the device.

Appendix 4

This section covers description of commands intended to control AutoGRAPH-INFO-TFT via data server.

All server commands must be sent to AutoGRAPH-INFO-TFT via the AutoGRAPH on-board controller, which the display is connected to.

To send a command to AutoGRAPH-INFO-TFT from data server:

• open the \Conf folder on the AutoGRAPH Server;

• in the \Conf directory, select the folder of the AutoGRAPH controller, which AutoGRAPH-INFO-TFT is connected to. A controller folder is termed as the controller serial number (Fig.80);
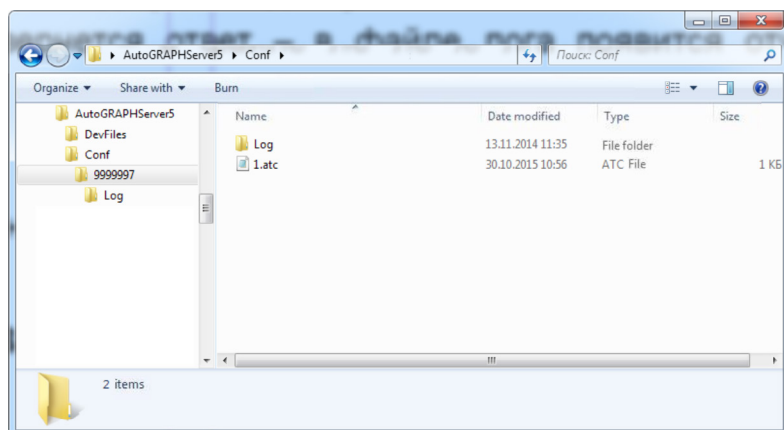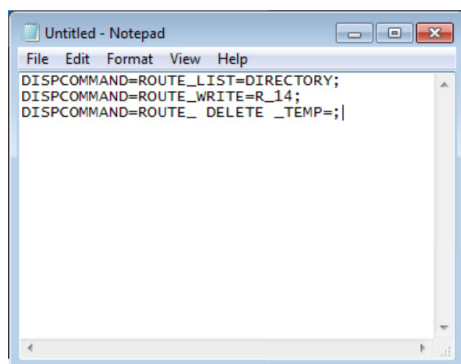

Fig.80. \Conf folder structure..

• create a text file in the folder of the AutoGRAPH controller and change it extension to .atc;

• specify all commands to be sent in this file of .atc format. Every command must be entered in a new line and match the stipulated format (Fig.81). Otherwise, processing of the command, as well as incorrectly specified atc. file, will be unavailable.

Fig.81. Sample content of .atc file.

• As the command is processed by the AutoGRAPH controller, the reply will be sent to server – a report will be recorded in the log file (in the \Log folder, Fig.80). After processing the command, the AutoGRAPH controller will transmit it to connected AutoGRAPH-INFO via RS-485 bus.

Format of commands

Given below is description of commands, supported by AutoGRAPH-INFO-TFT.
The list of supported command depends on the device firmware version, so it is recommended always to use the last firmware in order to provide maximum functionality of the device.

ROUTE LIST REQUEST FROM SPECIFIED DIRECTORY

Command format:
DISPCOMMAND=ROUTE_LIST=DIRECTORY;

where
• **DIRECTORY** – a name of the folder containing route files: Route, RS485, Temp.

In a reply to the command, AutoGRAPH-INFO-TFT sends a list of routes (comma separated) in the requested folder.

Sample command:
DISPCOMMAND=ROUTE_LIST=Routes;

Sample reply (log):
>|12:00:57|DISPCOMMAND=ROUTE_LIST=Routes;
<|10:46:27|DISPCOMMAND=ROUTE_LIST=Routes\R_13,R_56,R_57,R_14,R_180f,R_58;
!|12:00:57|CONF ACCEPTED

COMMAND TO MOVE SPECIFIED ROUTE FROM THE \RS485 FOLDER TO THE \Routes FOLDER

Command format:
DISPCOMMAND=ROUTE_WRITE=R_NNNN;

where
• **NNNN** – a number of route to move. The whole number contains a route number (3 characters) and the route index (1 character), e.g. 124a, 124b.

The command moves the specified route file from the \Routes folder to the \RS485 folder of the device SD-card. This will also move the route with the same name existing in the \Routes folder to the \Temp folder of the SD-card. After that a new route from the \RS485 folder becomes available for the usage.

Sample command:
DISPCOMMAND=ROUTE_WRITE=R_14;

Sample reply (log):
>|15:09:42|DISPCOMMAND=ROUTE_WRITE=R_14;
<|15:09:42|DISPCOMMAND=ROUTE_WRITE=R_14;
!|15:09:42|CONF ACCEPTED

COMMAND TO DELETE THE SPECIFIED ROUTE FROM THE \Routes FOLDER

Command format:
DISPCOMMAND=ROUTE_DELETE=R_NNNN;

where
• **NNNN** – a number of route to delete. The whole number contains a route number (3 characters) and the route index (1 character), e.g. 124a, 124b.

• The command deletes the specified route file from the \Routes folder.

Sample command:
DISPCOMMAND=ROUTE_DELETE=R_56c;

Sample reply (log):
>|11:05:36|DISPCOMMAND=ROUTE_DELETE=R_56c;
<|11:05:36|DISPCOMMAND=ROUTE_DELETE=R_56c;
!|11:05:36|CONF ACCEPTED

COMMAND TO MOVE ALL ROUTES FROM THE \RS485 FOLDER TO \Routes FOLDER

Command format:
DISPCOMMAND=ROUTE_UPGRATE=;

The command moves all routes from the \RS485 folder to the \Routes folder of the device SD-card. The existing files with the same names as the files from the \RS485 folder, will be moved from the \Routes folder to temporary folder – \Temp of the device SD-card.
Using this command, you can quickly update a route list by new routes downloaded from server.

Sample command:
DISPCOMMAND=ROUTE_UPGRATE =;

Sample reply (log):
>|11:05:36|DISPCOMMAND=ROUTE_UPGRATE =;
<|11:05:36|DISPCOMMAND=ROUTE_UPGRATE =;
!|11:05:36|CONF ACCEPTED

• In addition to the server command – ROUTE_UPGRATE, intended to update route files in the \Routes folder of the device SD-card, there is the similar SMS command, which must be sent to an active SIM of the AutoGRAPH controller which the display is connected to.

Command format:
DISPLAY=!$Update routes;

where
- **!** – flag of the priority SMS requiring an acknowledgement;
- **$** – flag of the request to update all routes.

The symbols described below are essential. A text following the "$" symbol is user-defined. At the end of the text, the ";" is required.

After receiving the message and pressing the button to confirm the reception, AutoGRAPH-INFO-TFT will process the command ROUTE_UPGRATE.

TIMER READINGS REQUEST

Command format:
DISPCOMMAND=TIMER_LIST=;

In reply, AutoGRAPH-INFO-TFT sends value of the each timer (in seconds). The reply matches the following format:

DISPCOMMAND=TIMER_LIST=T1, T2, T3, T4;

where T1, T2, T3, T4 – time of device timers T1, T2, T3, T4.

Sample command:
DISPCOMMAND=TIMER_LIST=;

Sample reply (log):
>|12:00:57|DISPCOMMAND=TIMER_LIST=;
<|10:46:27|DISPCOMMAND=TIMER_LIST=0, 21600, 0, 172800;
!|12:00:57|CONF ACCEPTED

AutoGRAPH-INFO-TFT returns following values: Timer 1=0, Timer 2=21600 s (6 hours), Timer 3=0, Timer 4=172800 (the device total operation time is 48 hours).

COMMAND TO UPDATE THE \Conf FOLDER CONTENT

Command format:
DISPCOMMAND=CONFIG_UPGRADE=;

The command moves the \Conf folder from the \RS485 folder to the root directory of the device SD-card, replacing the at that the existing \Conf folder with old configuration. The old \Conf folder is moved to the \Temp folder of the SD-card which can be emptied manually or by the server command.

Sample command:
DISPCOMMAND=CONFIG_UPGRADE=;

Sample reply (log):

>|10:00:57|DISPCOMMAND=CONFIG_UPGRADE=;
<|10:15:27|DISPCOMMAND=CONFIG_UPGRADE=;
!|10:15:35|CONF ACCEPTED

COMMAND TO UPDATE THE \CarDrivers FOLDER CONTENT

Command format:

DISPCOMMAND=DRIVERS_UPGRADE=;

The command moves the \CarDrivers folder from the \RS485 folder to the root directory of the device SD card replacing the existing \CarDrivers folder which is in turn moved to the \Temp folder. As necessary, the \Temp folder can be emptied manually or by the server command.

Sample command:

DISPCOMMAND=DRIVERS_UPGRADE=;

Sample reply (log):

>|10:00:57|DISPCOMMAND=DRIVERS_UPGRADE=;
<|10:15:27|DISPCOMMAND=DRIVERS_UPGRADE=;
!|10:15:35|CONF ACCEPTED

COMMAND TO EMPTY THE \Temp FOLDER

Command format:
DISPCOMMAND=DELETE_TEMP=;

Sample command:
>|16:37:43|DISPCOMMAND=DELETE_TEMP=;

Sample reply (log):
>|16:37:43|DISPCOMMAND=DELETE_TEMP=;
<|16:37:43|DISPCOMMAND=DELETE_TEMP=;
!|16:37:43|CONF ACCEPTED

• If the transmitted command does not match the stipulated format or the command processing is failed for other reason, AutoGRAPh-INFO-TFT will return an error message.

• Given below is sample log of the command processing in case that the \Temp folder is not found (deleted or not created):

>|16:37:43|DISPCOMMAND=DELETE_TEMP =;
<|16:37:43|DISPCOMMAND=DELETE_TEMP =Error-5[FR_NO_PATH]
!|16:37:43|CONF ACCEPTED

GLONASS GPS

AutoGRAPH

VEHICLE AND PERSONAL TRACKING SYSTEM

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