geneko

AVL

USER MANUAL

Fox Easy - AVL device

Device firmware version: 1.0.0 and later
Document version: 1.0.5
Date: July 2016

Trademark

Table of Contents

1 Overview

Thank you for your interest in Geneko products.
This document contains information on installation of Geneko Fox Easy device into motor vehicles.

2 Approvals

RB General Ekonomik
HARDWARE · SOFTWARE · ENGINEERING

CE

DECLARATION OF CONFORMITY

We hereby declare, that following product

GPS/GSM TERMINAL

Product name	Model/Type reference	Ratings
Geneko Fox Easy	**Fox Easy**	**9-36V ⎓ 25 mA**

are in conformity with standards harmonized with directives:

LVD (Safety)	EN 60950-1:2006 + A1:2010 + A2:2013 + A11:2009 + A12:2011 Test Report No. T223-0421/15 (SIQ) EN62311:2008 Test Report No. UL05420131227CE 008-3 (Unilab)
EMC	EN 301 489-7 v1.3.1, EN 301 489-3 v1.6.1, EN 301 489-1 v1.9.2 Test Report No. T251-0719/15 (SIQ)
AUTOMOTIVE EMC	E/ECE Regulation No. 10, Revision 5 Test Report No. T251-0927/15
Radio Spectrum	EN 301 511 v9.0.2, EN 300 440-1 v1.6.1, EN 300 440-2 v1.4.1 Test Reports No. UL05420131227CE 008-2, UL05420131227CE 005-4 (Unilab)
E26	E/ECE Regulation No. 10, Revision 5 Approval No.: E26 10 R 05 1194*00, Test Report No. T251-0927/15 (SIQ)
R&TTE	R&TTE Directive 1999/5/EC, Article 10 (5) and Annex IV Statement of Opinion No. 1304-R&TTE-045

CE dcl Fox Easy Rev. A Mar 16

Year of affixing of CE mark:
2016

CE 1304

Director
Borisav Bojković

Place and date:
Belgrade, March 29, 2016

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SIQ

Statement of Opinion

Number: **1304-R&TTE-045** Project file: C20151698

This Statement of Opinion is issued in accordance with Article 10(5) and Annex IV of R&TTE Directive 1999/5/EC

Product: **GPS/GSM terminal**

Type reference: **Fox Easy**

Trademark: GENEKO

Applicant: RB GENERALEKONOMIK
Bulevar Despota Stefana 59a/003-floor 1, RS-11000 Belgrade, Serbia

Manufacturer: **RB GENERALEKONOMIK**
Bulevar Despota Stefana 59a/003-floor 1, RS-11000 Belgrade, Serbia

Place of manufacture: RB GENERALEKONOMIK
Bulevar Despota Stefana 59a/003-floor 1, RS-11000 Belgrade, Serbia

This statement of opinion is given in respect of compliance of radio spectrum use (Art. 3(2) of the R&TTE Directive 1999/5/EC) and concerns the product identified above and its compliance with the following essential requirements:

Essential Requirements	Specification	Testing Laboratory	Test Report No.	Result
Safety Article 3.1(a)	EN 60950-1:2006 + A1:2010 + A2:2013 + A11:2009 + A12:2011	SIQ Ljubljana	T223-0421/15	Conform
	EN 62311:2008	Unilab	UL05420131227CE 008-3	
EMC Article 3.1(b)	EN 301 489-7 v1.3.1, EN 301 489-3 v1.6.1, EN 301 489-1 v1.9.2	SIQ Ljubljana	T251-0719/15	Conform
Radio Spectrum Article 3.2	EN 301 511 v9.0.2	Unilab	UL05420131227CE 008-2	Conform
	EN 300 440-1 v1.6.1, EN 300 440-2 v1.4.1	Unilab	UL05420131227CE 005-4	

Notified body: SIQ Ljubljana
Tržaška cesta 2, SI-1000 Ljubljana, Slovenia

Identification number: **1304**

Our opinion in accordance with Annex IV of Council Directive 1999/5/EC on radio equipment and telecommunications equipment and the mutual recognition of their conformity is that the apparatus identified above complies with the requirements of that Directive stated in the above scope.

Date: 2016-02-03 **Authorized signature:** Bojan Pečavar

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TN417E-01

3 Introduction

This document is a comprehensive user manual for Geneko Fox Easy. It is designed for the users who will perform setup and installation of this device. This document contains information necessary for successful installation of the device into a motor vehicle.
Fox Easy device is a specific purpose device for installation into all types of motor vehicles. Although its basic purpose is installation into vehicles, various types of moving objects can be equipped with this device.

3.1 Warnings

Prior to installation, following precautions should be taken:

- It is necessary to check device, in order to find and repair possible physical damages occurred during transport
- It is necessary to take care about input power supply to be within allowed values in order that device does not suffer any damage
- When installing device into the vehicle it is necessary to take all precautions prescribed by the vehicle manufacturer
- It is necessary to have operational data server where device will send data

This device is not designed for operation in the environment where it can be exposed to high humidity, to temperature out of the allowed temperature range (defined in chapter 13 of this manual) or in an open space.

Manufacturer takes no responsibility for damage occurred on the vehicle, device or charge for GPRS data transfer if the instructions for Fox Easy device installation and use were violated. Also, manufacturer recommends user to get in touch with authorized person in Geneko in order to get help Fox Easy device parameter setup.

3.2 Tools Necessary for Installation

In order to perform installation correctly and completely, the technician must be in possession of following instruments and tools:

- Universal instrument with measurement options for DC and AC voltage, resistance and frequency. The instrument probe ends should be thin enough to reach the main connector from the back side, without taking it off from device. Also, the probes should have extensions with insulated crocodile pincers
- Portable oscilloscope (operating frequency is irrelevant since the frequencies up to 20 kHz are measured)
- Laptop with installed Windows operating system and Fox Configurator program. Laptop must be equipped with standard Serial RS-232 port. However, USB to Serial adapter can be used if laptop has no standard Serial RS-232 port
- Fox Serial Cable for connecting Fox Easy to laptop. Note that this is custom made cable, and only ones provided by Geneko can be used
- Soldering iron 60-100 W and 1 mm diameter solder

- Torx screwdrivers (T15, T20 and T25)
- Crosshead screwdrivers (PZ0, PZ1 and PZ2)
- Plain screwdrivers (3 mm and 5 mm)
- Flexible claw pick up tool, at least 75 cm long
- Flush cutters
- Cutter knife
- Insulation tape
- Heat shrinking tube, 3.2 mm, 4.8 mm and 6.4 mm diameter
- Gas torch or lighter for heat shrinking tube
- Cable ties: 100 mm, 200 mm and 300 mm in length

3.3 Basic Features

Basic features of Fox Easy device are:

- Main power supply of this device can be 7 to 36 VDC
- Built-in GSM and GPS antennas
- Single connector for power supply and input/output signals connection
- Connector for connection with PC (RS232 port with TTL voltage level)
- Solid casing made from ABS plastic, suitable for installing in the vehicle
- LED indication for power/GPRS and GPS

3.4 Description of System Parts

Sealed package of Fox Easy device contains the following parts:

- One Fox Easy device
- Internal GSM and GPS antennas within device casing
- Main cable for connecting power supply and contact key signal
- Fox Serial Cable for connection with PC (optional, upon customer request)

4 Device Description

4.1 Device

Fox Easy is Automatic Vehicle Location device with the purpose of determining and transmitting geographic location of a vehicle. It is a technologically advanced device with top quality GPS/GLONASS module capable of tracking vehicles via satellite positioning systems. It is a small-form device packed in a case that is ideal for size-constrained applications. It comes with GPS and GSM antennas integrated and it is very easy to install and manage. The data between the device and PC or mobile phone are transferred through mobile network while double set of parameters for local network and roaming optimizes GPRS data traffic.
The device can be powered via OBD-II connector – in that way it can be placed on the instrument board of the vehicle without any assistance from the technician for the installation. The connector is available on request.
There is also another way to connect the device via special connector and for such installation technician's assistance is required.

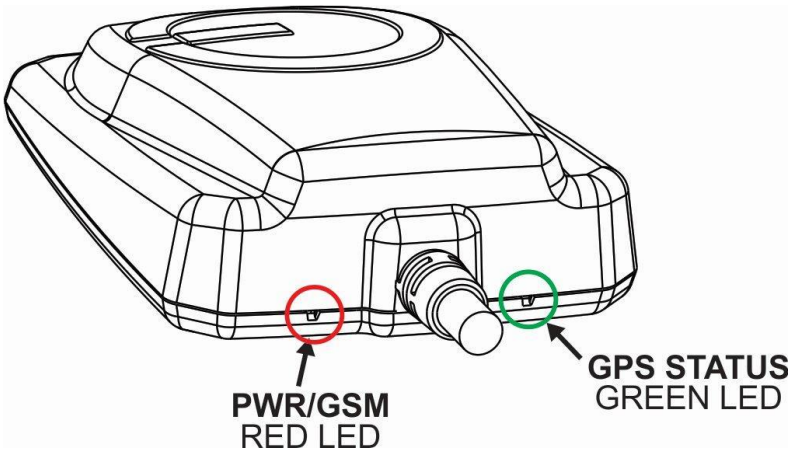
4.2 Main Cable Wire Description

Main cable is designed for connecting power supply and contact signal. Serial cable is designed to connect Fox Easy device to PC for device configuration and debugging.

1. Digital input wire (green colour) used for vehicle ignition key signal (built in pull_down resistor, positive trigger).
2. Ground (GND), black colour.
3. Main power supply (vehicle battery +12 V or +24 V systems), red colour.
4. OBD-II connector power option – when powered via OBD-II device can be installed without technician’s assistance

4.3 Device Back Side

Back side of device contains two coloured signal LEDs.



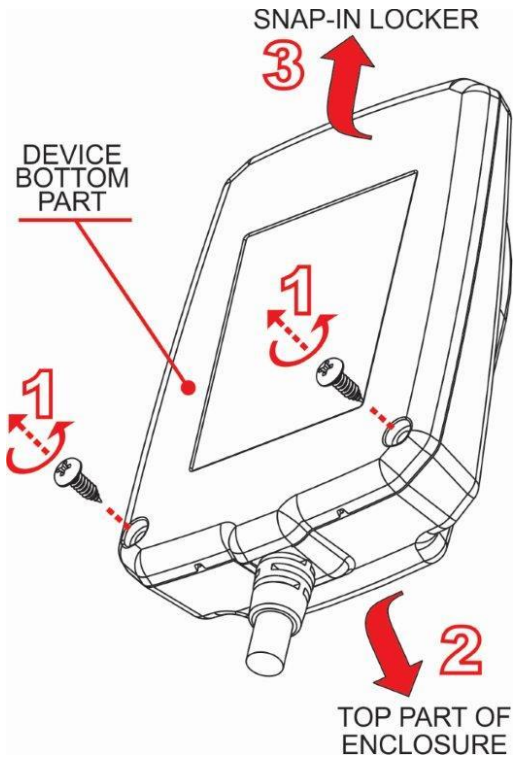
Green LED indicates GPS activity:

GPS LED behaviour	*GPS module operating status*
Permanently off	GPS is turn off
Slow blink	Invalid GPS position
Permanently on	GPS valid position

Red LED indicates GSM activity:

GSM LED behaviour	*GSM module operating status*
Permanently off	POWER DOWN or SLEEP mode
Slow blink	Connected to network
Fast blink	Connected to USSD
Permanently on	Connected to the Internet (The LED will blink during transfer burst)

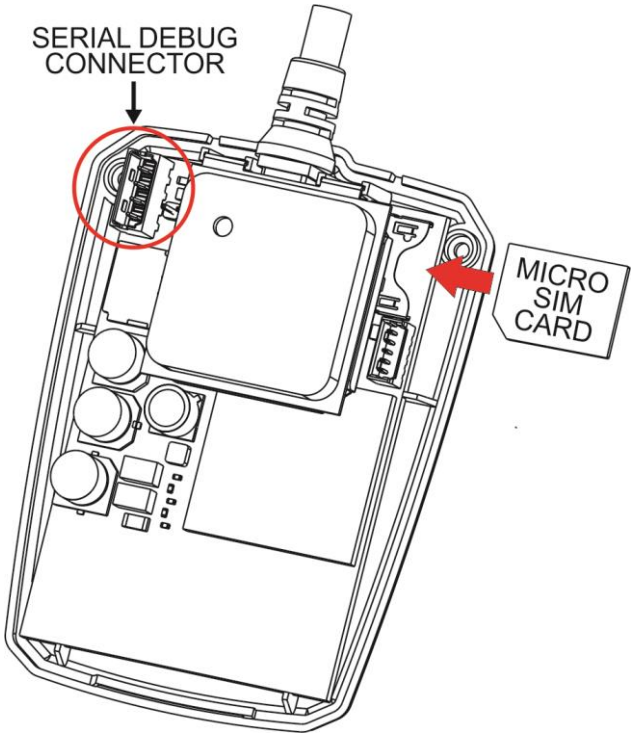
4.4 Device Bottom Side



There are two screws on Fox Easy bottom side. To remove the bottom cover it is necessary to remove the screws.

4.5 Device Top Side

When the cover is removed you can insert micro SIM card.



5 Fox Easy Quick Start

These 8 steps will show you how to quickly set up Fox Easy device:

Step 1: Connect wires of Fox Easy main cable to vehicle electrical installation. Connection is: positive power supply to red wire (+Vcc), negative power supply to black wire (GND) and ignition key signal to green wire**.**

WARNING: During this operation keep red wire disconnected from power supply.

Step 2: Remove the screws from bottom of Fox Easy device, and remove plastic cover.

Step 3: Insert micro SIM card in the SIM card holder.

Step 4: Connect black wire on ground and red wire on power supply. Red LED will start to blink.

Step 5: Connect Fox Easy device to PC Serial port with Fox Serial Cable and Start Fox Configurator software (if not installed, run setup for Fox Configurator application). Also, turn ON ignition key to prevent power save modes during the configuration process.

Step 6: In Fox Configurator software set up following parameters:

1) **GPRS User Name:** user name for GPRS service
2) **GPRS Password:** password for GPRS service
3) **GPRS Access Point Name:** Access Network Point for GPRS service
4) **SMS Message Center Number:** GSM SMS message center number
5) **Pin code:** PIN code number (If SIM card request PIN code this parameter must be correctly set)
6) **Server IP Address**: server static IP address
7) **TCP/IP Data Port**: server TCP/IP port number for receiving data from Fox Easy
8) **Vehicle ID:** Vehicle ID number
9) **Command:** Enter a **RS:10** to reset a Fox Easy device

Step 7: After configuration file is loaded into Fox Easy device it should start sending data to server in approximately 60 sec.

Step 8: Turn off power supply, put back plastic cover on Fox Easy device and put the screws back on bottom of Fox Easy.

6 Fox Easy with OBD-II Connector Quick Start

Here you can find instructions, in 7 short steps, how to quickly set up Fox Easy device:

Step 1: Remove the screws from bottom of Fox Easy device, and remove plastic cover.

Step 2: Insert micro SIM card in the SIM card holder.

Step 3: Connect OBD-II connector of Fox Easy to vehicle OBD-II installation.

Step 4: Connect Fox Easy device to PC Serial port, with Fox Serial Cable and Start Fox Configurator software (if is not installed, run setup for Fox Configurator application). Also, turn ON ignition key to prevent power save modes during the configuration process.

Step 5: In Fox Configurator software setup following parameters:

1) **GPRS User Name:** user name for GPRS service
2) **GPRS Password:** password for GPRS service
3) **GPRS Access Point Name:** Access Network Point for GPRS service
4) **SMS Message Center Number:** GSM SMS message center number
5) **Pin code:** PIN code number (If SIM card request PIN code this parameter must be correctly set)
6) **Server IP Address**: server static IP address
7) **TCP/IP Data Port**: server TCP/IP port number for receiving data from Fox Easy device
8) **Vehicle ID:** Vehicle ID number
9) **Command:** Enter a **RS:10** to reset a Fox Easy device

Step 6: After configuration file is loaded into Fox Easy device it should start sending data to server in approximately 60 sec.

Step 7: Disconnect OBD II connector of Fox Easy from vehicle OBD II installation, then put back plastic cover on Fox Easy device and put the screws back on bottom of Fox Easy.

7 Fox Easy Functions

Basic Functions:

- Satellite vehicle locating, tracking and mapping in real-time via PC, smartphone or tablet
  - Determining Geo location of the vehicle via GPS/GLONASS
  - Sending vehicle Geo data to PC/smartphone/tablet via mobile network
  - Showing vehicle's Geo position on the map (OpenStreet Map, Geneko WMS or Google Maps)
- Automatic monitoring of vehicle statuses and important events, reporting by GPRS and SMS
  - Detection of irregular/critical vehicle state and sending the warning signal via mobile network (GPRS/SMS)
  - Custom-defined parameters for event triggering
    - Vehicle start
    - Vehicle engine turn off
    - Exceeding the speed limit
    - Crash
    - Vehicle movements when the engine is turned off
    - Other events detected via digital or analogue input
  - Calculation of distance travelled and maximum vehicle speed
  - Battery voltage level

Other Functions:

You can set up device parameters with Web/Android application for remote setup or with Fox Configurator application for PC via serial cable

- GSM&SIM
- GPS data sending algorithm
- Roaming profile for minimizing GPRS expenses
- Energy saving
- General purpose Input/Output customization
- Phonebook with special functions for dedicated numbers
- Remote device management
- Remote firmware update with possibility of adding new features
- Sending records at predefined time period or at predefined time of the day
- Advanced power save function

Other Features:

- Data between device and PC/smartphone is sent via GSM/GPRS mobile network
- Data on vehicle location and state is sent even if the primary FMS (Fleet Management System) server is down thanks to redirection to backup server
- High quality embedded GSM/GPS/GLONASS modules
- Logger capacity is around 10,000 records which is sufficient for keeping the data for several days – this is especially useful while the vehicle is located abroad as no data transfer is necessary
- Remote device configuration capability
- Remote device debug capability

- ❖ Parameter (device configuration) backup in SIM card memory
- ❖ Binary sending formats
- ❖ Ability to use M2M SIM cards
- ❖ TCP/IP protocol
- ❖ Backup server IP address
- ❖ Test sequence on serial port
- ❖ Smart Phonebook with easily defined functions for each number
- ❖ Phonebook with special functions of some numbers
- ❖ PC configuration settings
- ❖ Shock/acceleration sensor. In power save mode, shock/acceleration sensor detects mechanical shock and wakes up device from power save mode. In normal operation mode it will detect vehicle crash event.

7.1 Sending Records Using GPRS

Sending information using GPRS service is primary function of the device. Record contains information such as: time, GPS position, vehicle's status information and other event data. Content of the record is fully configurable using device setup.
All records can be classified in two categories:

- Records with regular GPS position data, generated by intelligent sending algorithm
- Asynchronous records containing event data

7.1.1 Sending Regular GPS Data

Vehicle tracking using electronic maps is possible only if device periodically sends GPS position data. This period is determined by passed time, traveled distance and intelligent sending algorithm.
Device built-in expert system takes many parameters into account to resolve best time for sending GPS position data. Main goal is to minimize amount of sent data and to have optimal track on map. Device will send GPS data if following conditions are met:

- As soon as device receives first valid GPS position (only on startups, and in case of losing GPS signal in tunnels, garages and etc.)
- Vehicle stops moving (ignition key on)
- Vehicle starts moving (ignition key on)
- If maximum sending time from last sent position expires (ignition key on)
- If maximum distance from last sent position has been traveled (ignition key on)
- If intelligent sending algorithm criteria is met

Record with regular GPS data includes time information, vehicle status, distance traveled from device start up (wake up from power save).

7.1.2 Sending Events

Device sends event data when event occurs. Record with event data includes: event ID, time when event occurs, GPS position where event occurred, vehicle status, and event data. Event will be sent when:

- Vehicle battery under voltage is detected
- Device responds on remote commands
- Changing state of the device (reset or waking up from power save mode)

7.2 Calculation of Traveled Distance

Using GPS data, device calculates distance traveled from first start-up to present position in meters. Traveled distance is sent as part of regular GPS data records and with ignition on/off message. Total error of traveled distance calculation algorithm depends on GPS reception, and in cases when GPS signal is continuous can be less then 2%.

7.3 Data Logging

Fox Easy device logger has capacity of more than 10.000 records. Logger can be configured to work in three different modes:

- Real time sending. In this mode no records are logged unless GPRS signal is weak, GPRS is disabled or there is no response from the server.
- Data logging while in roaming. Device can be set up to log data records while device is in roaming. Device will stop logging and send logged data as soon as vehicle enters domestic GSM networks.
- Sending log periodically. Device can be set up to send log with predefined time period or at predefined day times.

7.4 Vehicle Battery Under Voltage Detection and Protection

When device detects low vehicle battery voltage (lower then the value specified in “Protection level [mV]“ (LVP) parameter) the „Main battery voltage“ event is generated. When normal vehicle battery voltage is restored the „Main battery voltage“ event will be generated again.
Additionally, device supports over discharge protection option to protect vehicle's battery from over discharging. Over discharge option is active when ignition is switched off and vehicle battery voltage is lower then the value specified in “Protection level [mV]“ (LVP) parameter. Fox Easy will exit protection state if ignition key is switched on or when battery voltage is restored. Device will wake up from protection state every 10 minutes to check if vehicle battery voltage is restored.

7.5 Remote Parameter Setup

Fox Easy parameters can be set up remotely from cell phone, using SMS. Device accepts commands only from phone numbers who are specially defined in phone book or number defined as “Server Phone Number”. Command format for remote parameter change is given in Chapter 11 .

7.6 Remote Executive Commands

Device is able to execute remote commands from phone book numbers or “Server Phone Number” (sent by SMS). Here is the list of possible actions, see Chapter 11 for details:

- Remote firmware update
- Activate/deactivate device outputs
- Send position and vehicle status on demand

- Read device logger
- Delete logger
- Reset device
- Read device parameters
- Restore device parameters from SIM card
- Read device debug information
- Delete all parameters
- Format file system
- Format phone book
- Shock/acceleration sensor calibration
- Add/remove/read Phone book items

7.7 Remote Firmware Update

Fox Easy firmware can be remotely updated. Firmware can be updated while device is in regular operating condition. During that time device will stop with regular operating condition.
Firmware updating procedure can be initiated by remote command using SMS message or from server using GPRS. Device parameters are not going to be changed after performing remote firmware update. In case new firmware is using new parameter (one that did not exist in previous firmware version), one will be created and will be set to default value.
Time for firmware update varies from 2 to 5 min depending on GPRS signal quality and size of files that have to be downloaded from update server.

NOTE: It is strongly recommended not to send messages or make phone calls to device while it is in firmware update procedure. Also, although it is possible, don't send multiple commands in SMS message with firmware update command.

Firmware update results on feedback SMS message:

Update ok (**N**) – firmware successfully updated, or
Update error (**N**) – error during firmware update.

*NOTE: **N** is internal state code and it is not important for users.*

7.8 Parameter (Device Configuration) Backup in SIM Card Memory

Device keeps parameters (configuration) in its own non-volatile memory. Also, copy of all parameters is kept in SIM card memory. Regarding SIM card memory capacity, phonebook will also be stored in SIM card memory. Before SIM card is inserted in device, user can set up device to restore (overwrite) parameters which are in device non-volatile memory with ones from SIM card memory. After user inserts SIM card and powers up device, parameter restore will take place as it is described. Once restore is done, it will not take place again until user set up device again to restore parameters from SIM card.
This option is very useful if it is necessary to replace malfunctioned device in field. Thus, all parameters from malfunctioned device can be restored to new device using SIM card from malfunctioned device.

7.9 Data Formats

Device is configured to use public sending protocols for sending data to server:

- **Binary** - communication protocol code 1
- **XML** - communication protocol code 2

7.10 Advanced Power Save Option

Power save function is designed to reduce power consumption of the device when the vehicle is not in use. After parking the vehicle (when ignition key is switched off) device will go to power save mode. Power consumption in this mode is reduced.

There are 9 parameters that affect Power Save mode:

- **Protection level [mV]**
  Vehicle battery over discharge option is active when ignition key is switched off and vehicle battery voltage is lower than the value specified in “Protection level [mV] “ (LVP) parameter.
- **Power save time [min]**
  After positioning ignition key to off, device will go from Power-On state to Standby state immediately with no change in functionality. When the time defined by “Power save time [min]” parameter expires the device will go from Standby state to Sleep state. GPS module is active in Sleep state if “GPS always on“ parameter is enabled. While in Sleep state device doesn't send any records using GPRS but GSM receiver is in stand-by mode, allowing reception of incoming voice calls and SMS messages. When device is in Sleep state, Power Save mode is active. If parameter “Power save time [min]” has value 0 power save options are inactive.
- **Power save wake up time [min]**
  Device wakes up from Sleep state and goes to Send state when time defined by “Power save wake up time [min]“ parameter expires. In Send state device turns on all modules and sends GPS position to server like “WDT start“ event. After position is successfully sent device go back to Sleep state. If device can not send position during time defined by “Sending timeout [s]” parameter, it will save position to log memory and go back to Sleep state.
- **Hibernation enables**
  If “Hibernation enable” parameter is enabled, device can go to Deep Power Save mode. Otherwise Deep Power Save mode is disabled.
- **Hibernate time[h]**
  If “Hibernation enable” parameter is enabled, device will go to Hibernate state when ignition key is switched off and time defined by “Hibernate time [h]“ parameter expires. In Hibernate state, only GSM receiver is in stand-by mode, allowing reception of incoming voice calls and SMS messages. Other modules are powered down. When device is in Hibernate state, Deep Power Save mode is active.
- **Sending timeout [s]**
  In Send state device will keep trying to send positions until time defined by “Sending timeout [s]“ parameter expires.

- **WDT event period in hibernation [min]**
  Device periodically wakes up from Deep Power Save mode and sends “WDT start” event to server. This period is defined with “WDT event period in hibernation [min]” parameter.
- **GPS always on**
  “GPS always on” parameter enables or disables GPS module in Power Save mode. If GPS module is disabled, power consumption in Power Save mode will be significantly lower. However, upon leaving Power Save mode, device will take some time to fix valid GPS position.
- **Wake on GPIO change**
  If this option is enabled, device will wake up from Power Save mode when change on GPIO pin is detected.

When ignition key is switched on, device will go to the Power-On state. When device is powered only from internal back-up battery, Power-On state is active.

7.11 Smart Phonebook

Fox Easy has smart phonebook feature. This feature enables user to add up to 128 numbers in phonebook and to separately assign functions to each one. Functions that can be assigned to phone numbers are:

1. Server phone number (admin function)
2. Send SMS to this number if over speed is detected
3. Send SMS to this number if crash is detected

Numbers in phonebook can be added or deleted using Fox Configurator or by remote SMS/GPRS commands.

NOTE: It is recommended to enter phone numbers in following format: <+><country_code><number>

NOTE: If “Server phone number” parameter is left empty, and none of phone numbers from list is assigned to be server phone number, device will accept SMS commands form any phone number (every phone number will have admin function).

7.12 SMS Alerting

Fox Easy device can send SMS alerts if one of predefined events occurs. To activate this option, “SMS Alert Period[s]” parameter should be set up. If parameter value is 0, SMS alerting is turned off. If value other than 0 is chosen it will define minimal period between two SMS messages for same event. SMS alert can be sent if one of following events occurs:

1. Over speed detection
2. Crash detection

If any of the above events occur the device will send SMS to every SMS-event enabled phone number from the phonebook.

SMS alert message is sent in the following format:

Vehicle ID,SMS ID,Additional Parameters,Date,Time,GPS Position,Vehicle Speed.

SMS ID and Additional Parameters fields depend on event that occurred. Their values are given in the following table:

Event	SMS ID	Additional Parameters
Overspeed detection	Overspeed	Vehicle Speed
Crash detection	CRASH Detected	/

7.13 Sending Profiles

Fox Easy device has 3 sets of parameters which define data sending (sending profiles). There are default, roaming and auxiliary sending profiles. In device configurator software, those parameters are defined in Sending, Roaming Profile and Auxiliary Profile tabs respectively.
If vehicle is in home network, device will use parameters defined in Sending or Auxiliary Profile set of parameters. If vehicle is in roaming network, then device will use set of parameters defined in Roaming tab.

8 Device Connection in vehicle

8.1 Device Position Selection

Fox Easy device should be put in a place with a specific range of humidity values with no heat sources or moving parts around the device. Fox Easy device has built-in GSM antenna. Therefore, device should be placed where it can receive GSM signal. Fox Easy device must be placed in horizontal position, i.e. the antenna upper surface must face the sky. The device should not be put under metal surface as it can reduce or totally degrade GPS signal quality.
The recommended position for installing the device is under plastic elements of the instrument board. Therefore, device should be placed on position where GSM signal will not be unacceptably reduced.

8.2 Main Power Supply Connection

Main power supply for device is usually taken from vehicle battery. It is connected to corresponding wire of the main cable (see chapter 4.2). There is 2 A fuse inside Fox Easy device. Regardless, it is recommended to connect main power supply through some of the vehicle's fuses. Fox Easy device is designed for operation with vehicle battery voltages of 12 VDC and 24 VDC.
Ground (BLACK wire) should be connected to vehicle battery negative end (or vehicle metal chassis if it is connected to ground).

WARNING: When performing this action please take all precaution measures so vehicle battery positive end does not cause short circuit with metal chassis of the vehicle.

8.3 Input Connection

Fox Easy has one digital input, ignition key signal GREEN wire.

8.4 Connecting Device for Operation

After connecting power supply and input signals (ignition), Fox Easy device can be put into operation. The following 6-step procedure should be strictly applied:

Step 1: Remove the screws from bottom of Fox Easy device, and remove plastic cover.

Step 2: Insert SIM card in card holder.

Step 3: Connect black wire to ground and red wire to power supply. Red LED will start to blink.

Step 4: Turn ON ignition key before configuration process to prevent power save modes. Configure device for proper operation using Fox Configurator program. After saving configuration file in Fox Configuration program, it should start sending data to server in approximately 60 sec.

Step 5: Turn off power supply, put back plastic cover on Fox Easy device and put the screws back on the bottom of the device.

Step6: Fix the device in the vehicle where the following conditions are met:

- Solid surface directly linked to vehicle chassis
- Hidden position in order not to be seen and easily reached/found
- As far as possible from all moving parts of the vehicle like motor, transmitter, shafts, wheels, etc.
- At locations where there is no humidity or condensation due to high temperature differences
- Away from heat sources

9 Fox Configurator

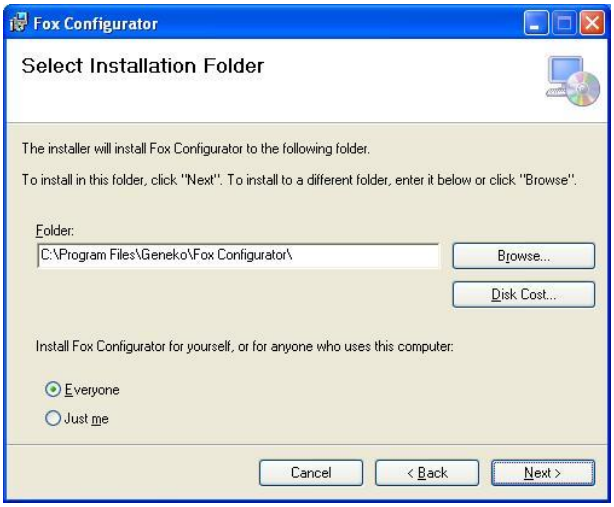
9.1 Fox Configurator Setup

Installation package contains two files and two folders:

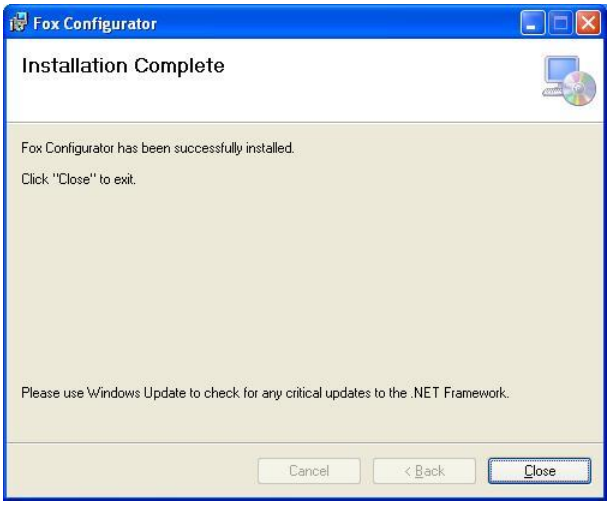
1. Setup.exe,
2. FoxConfiguratorSetup.msi,
3. Dotnetfx folder,
4. WindowsInstaller folder,

*NOTE: Remove any previous versions of this program before starting new installation. To install program, run **setup.exe**. In the first window that appears click Next.*

In the next window, using browse option, choose folder where to install the Fox Configurator program. When you chose folder, click *Next* to continue. In the next window click *Next* to confirm installation.

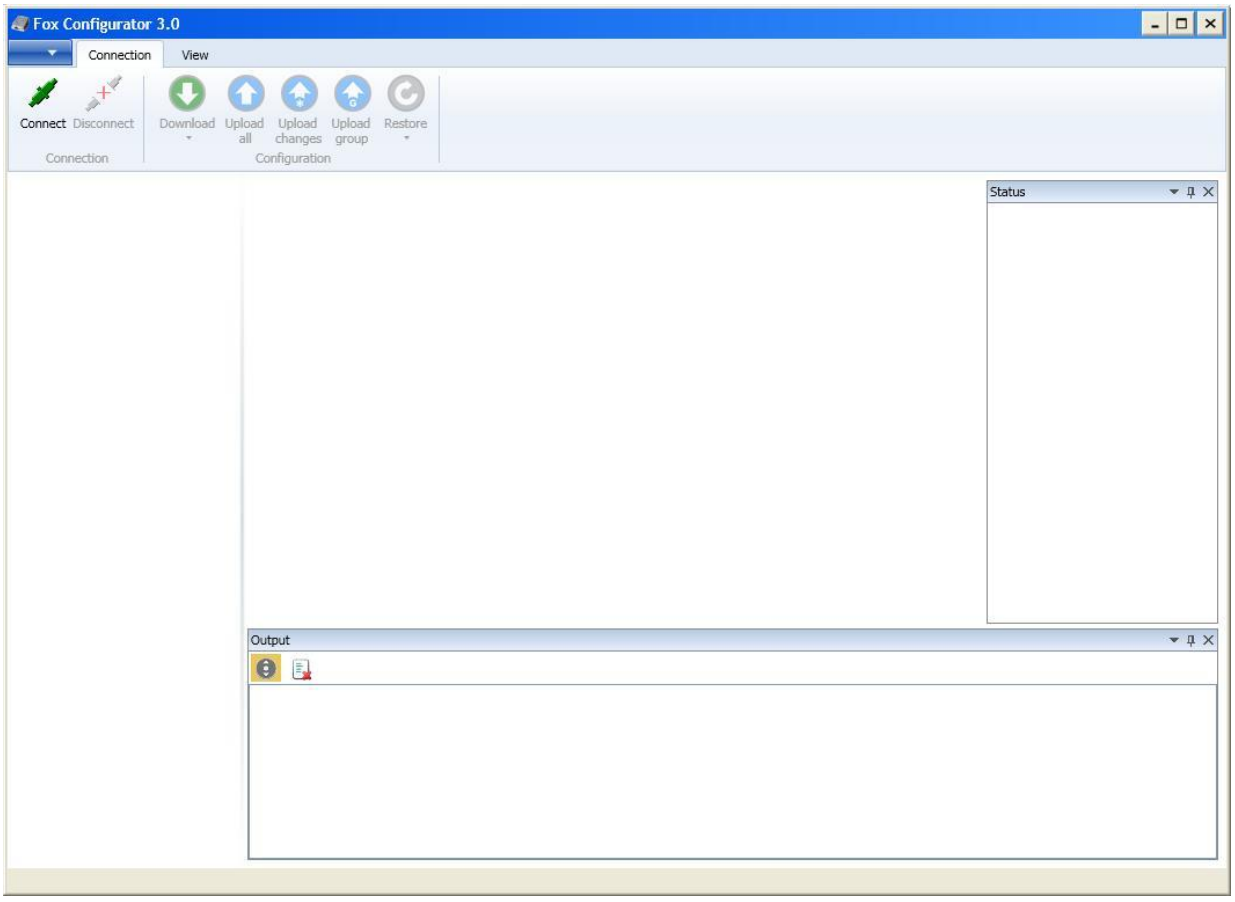


After installation is finished, following window will appear. To complete installation click *Close*.

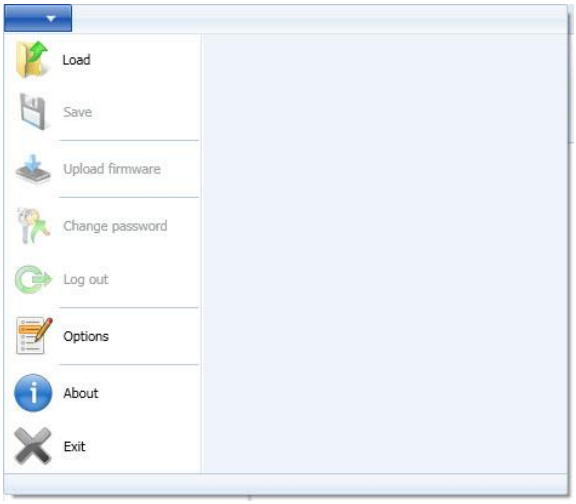


9.2 Configurator Settings

To run Fox Configurator, click on *Fox Configurator 3 RC* shortcut in *All Programs/* menu or click on *Fox Configurator 3 RC* shortcut on desktop. Following window will appear.



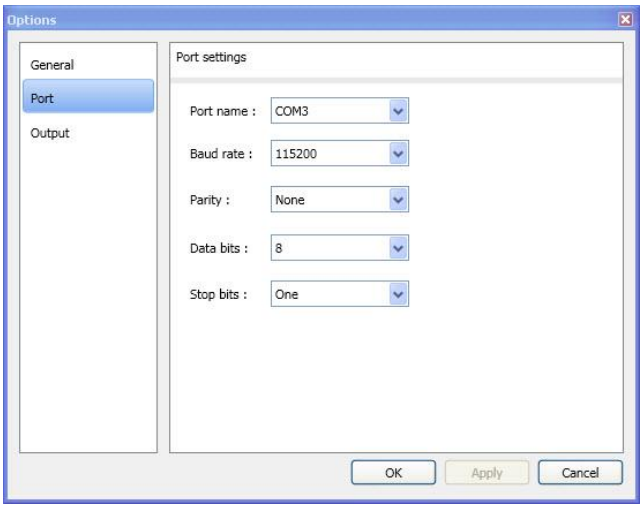
For serial port connection configuration, on top menu click button , then click Options.



In *Options* window select *Port* and configure parameters:

1. Port name – COM port on which Fox Easy is connected
2. Baud rate – 115200
3. Parity – None
4. Data bits – 8
5. Stop bits – One

Click *OK* or *Apply* to confirm.



9.3 Connecting Device to PC Using Serial Port

In order to connect device to COM (RS232) port on PC computer, **Fox Serial Cable** must be used. Note that this is special cable which can be provided only by Geneko. Connect one side to Fox Easy serial port, and the other side to RS232 port connector on your computer. Set up Configurator as shown in previous section. Connect device by pressing (Connect) button on the toolbar. If device is present, in configurator window will appear TEST and DEBUG information, depending on the current device settings. To disconnect device, press (Disconnect) button on the toolbar.

9.4 Configuring Device

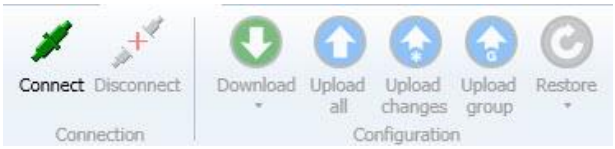
By pressing one of available buttons on the toolbar, user can do following actions:

1. (Connect) - Connecting to device
2. (Disconnect) - Disconnecting from device
3. (Download) - Download configuration file from device
4. (Upload all) - Upload all parameters to device
5. (Upload changes) - Upload only modified parameters to device
6. (Upload group) - Upload all parameters in group (e.g. General, GSM and SIM)
7. (Restore) - Restore modified parameters

By pressing button in top left corner following options are available to the user:

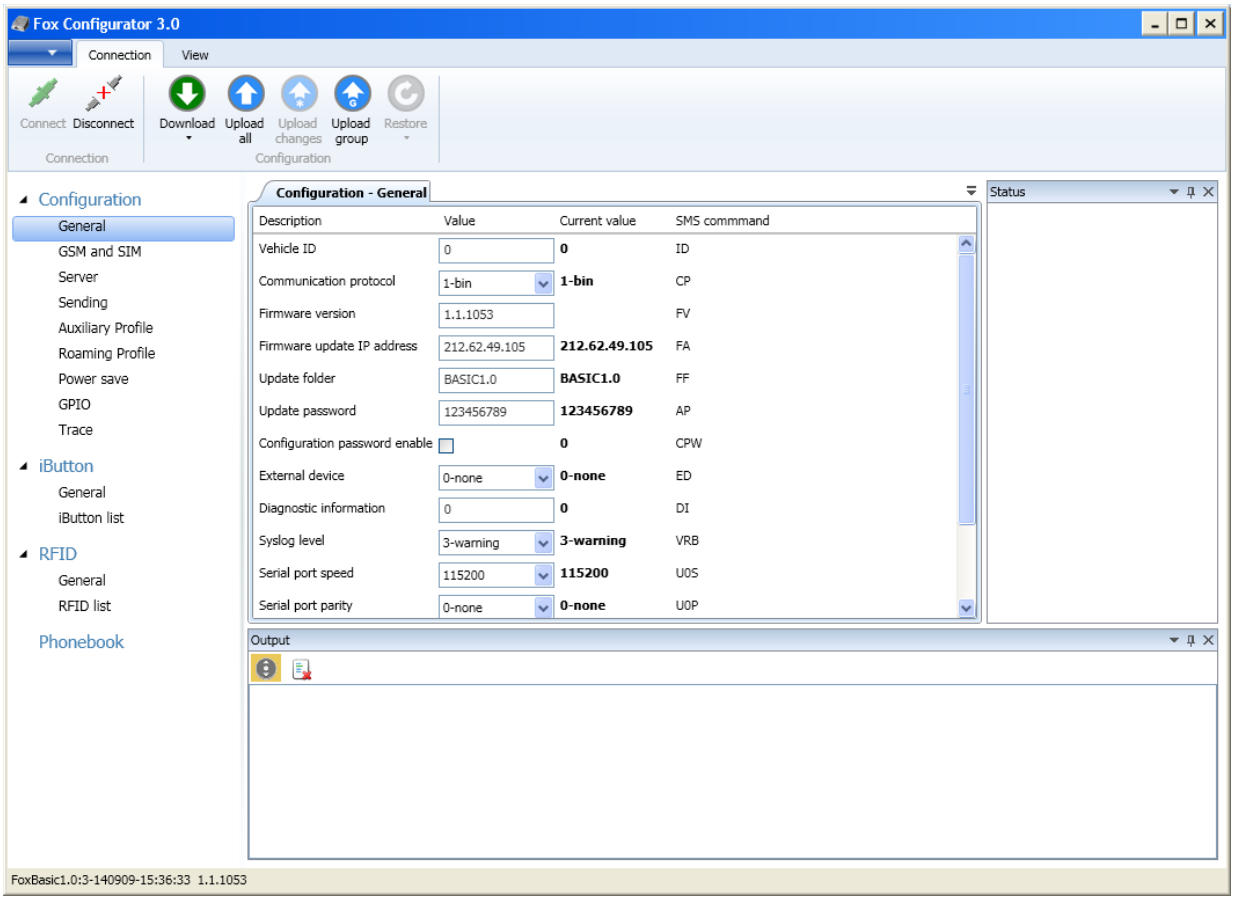
1. (Load) - Load configuration from file
2. (Save) - Save configuration to file
3. (Upload firmware) - Upload firmware to device from file.
4. (Change password) - Change Password option allows user to change configuration access password. Configuration menu access will be password protected only if *Configuration password enables* parameter is enabled. Also, in order to change the password, this parameter has to be enabled.
5. (Log out) - Log out from device
6. (Options) - In *Options* user can configure language (in General), Serial Port (in Port) setting see chapter 9.2 and path for saving configuration file (Output).

To start device configuration, press (Connect) button on the toolbar.



After connecting with device, press (Download) button on the toolbar. If device is present, program will read device configuration.

This operation will take about 20 seconds depending on device firmware and number of available parameters. Device parameters will be sorted in several groups and subgroups in left side of program window like on following picture:



User can access and change value of each parameter by selecting corresponding subgroup (e.g. General) and choosing desired parameter.
In Configuration window (in the middle of window - see picture above), for each parameter, there are 4 columns: *Description*, *Value*, *Current value* and *SMS command*.
In *Description* column you can find short description of each parameter.
User can change parameter value in *Value* column. Some parameters have check box for setting *Value*, others have drop-down list from which you can choose one of offered values, and for some you can enter value which has to be in range for that parameter.
In *Current Value* column there are values that are read from device when last Download (Read Configuration from device) operation was done.
In *SMS command* column, you can find SMS command code for each parameter.
If you want to write only modified parameters press *Upload changes* button. For writing all parameters in device memory press *Upload All* button. *Upload All* procedure will take more time than *Upload Changes*.

Once parameters are set up, user can store them in the file and save it to hard drive for later use. To do so, press button  in left top corner, then press button  Save. Save dialog will appear where user can choose file name and destination directory. The file will be saved with .xml extension. File can be opened later by pressing button  Load from the same menu.

10 Menu Items Description

10.1 General

Vehicle ID

Default value	**0**
Range	0 to 2147483647
Remote command	**ID**
Description	Unique vehicle identification number. For devices that send data on same server, vehicle identification numbers must differ.

Communication Protocol

Default value	**1**
Range	1 to 1
Remote command	**CP**
Description	Fox Easy device can send data using one of two data formats: 1 - Binary data format 2 - XML data format

Firmware Version

Default value	**x.x.x**
Range	x.x.x
Remote command	**FV**
Description	Current firmware version of Fox Easy.

Firmware Update IP Address

Default value	**212.62.49.105**
Range	IPV4 32-bits format
Remote command	**FA**
Description	Server IP address from which firmware is updated. User should change this parameter only if told by Geneko support team.

Update Folder

Default value	**EASY1.0**
Range	ASCII up to 175 CHAR
Remote command	**FF**
Description	Current firmware update folder (advanced setting).

Update Password

Default value	**123456789**
Range	ASCII up to 175 CHAR
Remote command	**AP**
Description	Access password for remote firmware update.

NOTE: User should not change this value.

Configuration Password Enable

Default value	**Disabled**
Range	Enabled or Disabled
Remote command	**CPW**
Description	User can enable or disable password protection of configuration menu access. If this parameter is enabled, device will ask the password on entering configuration menu. Otherwise, password will not be checked.

Diagnostic Information

Default value	**1**
Range	0 to 1
Remote command	**DI**
Description	Additional diagnostic information on serial port. **0** - Syslog information **1** - Device debug information on Syslog information will be always on.

Syslog Level

Default value	**3**
Range	0 to 7
Remote command	**VRB**
Description	This parameter determines level of system information available on serial port. Higher number means less information on serial port.

Serial Port Speed

Default value	**115200**
Range	4800 / 9600 / 19200 / 38400 / 115200
Remote command	**U0S**
Description	Speed of serial port. If changed by configurator or by remote command, new settings will take effect only after device restart.

Serial Port Parity

Default value	**0**
Range	0 to 2
Remote command	**U0P**
Description	Parity of primary serial port. If changed by configurator or by remote command, new settings will take effect only after device restarts. Parameter Options: **0** - None **1** - Even **2** - Odd

User Note

Default value	**text**
Range	text
Remote command	**RN**
Description	User note can be recorded to Fox Easy using command RN:text, and read using RP:RN

Restore Data From SIM

Default value	**Disabled**
Range	Enabled or Disabled
Remote command	**SRX**
Description	Device configuration (parameters) is stored in SIM card memory after every change. If this parameter is Enabled, upon power on or reset, device will read parameters from SIM card memory and store it in device internal memory. From that moment device will operate with new set of parameters (one that was in SIM card). This option will be automatically set up to Disabled immediately after successful parameter restore from SIM card.

10.2 GSM and SIM

GPRS Access Point Name (APN)

Default value	**internet**
Range	ASCII
Remote command	**GA**
Description	Access point name (APN). This parameter depends on GSM mobile operator.

GPRS User Name

Default value	**telenor**
Range	ASCII
Remote command	**GU**
Description	GPRS User Name. This parameter depends on GSM mobile operator.

GPRS Password

Default value	**gprs**
Range	ASCII
Remote command	**GP**
Description	GPRS Password. This parameter depends on GSM mobile operator.

SMS Center Number

Default value	**+38163100100**
Range	telephone number
Remote command	**GS**
Description	SMS Message Centre Number. This parameter depends on GSM mobile operator.

GSM Home Net Identity

Default value	
Range	ASCII
Remote command	**MO**
Description	GSM home network identification number.

PIN Code

Default value	**1111**
Range	0000 to 9999
Remote command	**PIN**
Description	SIM card PIN number. Must be entered if SIM card requests PIN code on start-up.

10.3 Server

Server IP Address

Default value	**195.178.52.166**
Range	IPV4 32-bits format
Remote command	**IP**
Description	Server IP address

Backup Server IP Address

Default value	**195.178.52.166**
Range	IPV4 32bits format
Remote command	**IPB**
Description	Backup server IP address. This server address will be used if main server is inaccessible for some period of time.

TCP/IP Data Port

Default value	**663**
Range	21-65535
Remote command	**PD**
Description	Server port number for data. Fox Easy device will send data to this server port via GPRS.

Backup TCP/IP Data Port

Default value	**663**
Range	21-65535
Remote command	**PDB**
Description	Backup server port number for data. Fox Easy device will send data to this port of backup server via GPRS.

Server Phone Number

Default value	**+38163559953**
Range	telephone number
Remote command	**SN**
Description	Server phone number is telephone number that can be used for remote commands sending (via SMS or GPRS).

NOTE: Current firmware version supports server phone number from phonebook for remote commands.

Auto Command Time [min]

Default value	**20**
Range	0 to 35791394
Remote command	**AC**
Description	This time defines minimal period in which Fox device will check for new commands on server via GPRS. If time defined by this parameter elapses, command will not be checked before device has something to send to server. Command check will not operate in power save mode. If value 0 is entered, device will never perform auto command check.

Strict Command Time

Default value	**Disabled**
Range	Enabled or Disabled
Remote command	**AS**
Description	If this parameter is enabled, Fox device will check for new commands on server via GPRS when time defined by Auto Command Time parameter elapsed. Fox device will also check for new commands on server via GPRS on incoming voice call. If this parameter is disabled and time defined by Auto Command Time parameter elapsed, command will not be checked before device has something to send to server. Command check will not operate in power save mode.

10.4 Sending

GPRS Enable

Default value	**Enabled**
Range	Enabled or Disabled
Remote command	**GE**
Description	Global flag for enabling GPRS service, if flag is disabled device will never use GPRS service. This flag will be ignored if DR: command is sent to device.

USSD Enable

Default value	**Enabled**
Range	Enabled or Disabled
Remote command	**G1**
Description	Flag for enabling USSD service. If this option is enabled, device will use USSD instead of GPRS service when device is in roaming networks and if GPRS service in roaming is disabled.

Geo-fence Zone Sending Profiles

Default value	**0**
Range	0,1
Remote command	**PZO**
Description	If value 0 is set up, device will use Default Sending parameters when vehicle is out of Geo-fence zone, and Auxiliary Sending parameters when device is in Geo-fence zone. If value 1 is chosen, device will use Auxilary Sending parameters when vehicle is out of Geo-fence zone, and Default Sending parameters when device is in Geo-fence zone.

Send GPS Position

Default value	**Enabled**
Range	Enabled or Disabled
Remote command	**SP**
Description	GPS position send enable. If disabled, GPS position event (code 0) will not be sent. GPS position will be sent only with other events.

Send GPS Position When Ignition Key is Off

Default value	**Disabled**
Range	Enabled or Disabled
Remote command	**CS**
Description	GPS position event send enable when ignition key is off. If parameter value is 1, sending of GPS positions event is enabled.

Send Events

Default value	**Enabled**
Range	Enabled, Disabled
Remote command	**SE**
Description	Event send permission (open/close door, battery empty...) by GPRS. If enabled, any change on enabled input pins will be sent via GPRS with corresponding event code.

Sending FMS period [s]

Default value	**0**
Range	0, 10 to 600

Remote command	**SF**
Description	FMS data send period. If parameter value is different from 0, all OBD II data received from external OBD II reader through serial port, will be sent to server in period defined by this parameter. If parameter value is 0, OBD II data will not be sent to server.

*NOTE: In order to setup serial port for receiving data from external ODB2 reader, parameter „**External device**“ (ED) must be set up to value **obd.***

SMS Alert Period [s]

Default value	**0**
Range	0, 10 to 1200
Remote command	**SA**
Description	This parameter defines minimal time between two SMS alert messages. If this parameter value is 0, SMS alerts are off.

Overspeed Sending treshold [s]

Default value	**60**
Range	10 to 1200
Remote command	**YS**
Description	This parameter is used to set up period for over-speed event. Over-speed event will not be sent in period shorter than defined by this parameter.

Logger Mode

Default value	**1**
Range	1 to 3
Remote command	**LM**
Description	1 - real time sending 2 - periodical in predefined time periods 3 - daytime period (at predefined daytime)

Logger Period [min]

Default value	**0**
Range	0 to 2147483647
Remote command	**LP**
Description	Period for sending data from logger if logger mode 2 is used. Period is defined in minutes. Parameter will take no effect if value 0 is set up.

Logger Time [hh.mm]

Default value	
Range	ASCII
Remote command	**LT**
Description	Time of a day (by UTC time) when logged data will be sent if logger mode 3 is used. It is allowed to enter several daytimes in ascending order separated by semicolon. Maximum string length for SMS command is 175 characters.

Logger Size Limit [kB]

Default value	**0**
Range	0 to 4096
Remote command	**LS**
Description	Logger memory size limit. By this parameter maximal logger size is defined. When log is full, oldest data will be overwritten. If parameter value is 0, there will be no limit for logger memory size (i.e. logger memory size will be maximal).

Maximum Time [s]

Default value	**300**
Range	0 to 2147483647
Remote command	**TO**
Description	Parameter of GPS position sending algorithm. New position will **always** be sent if this time expires from last sent position. Time is entered in seconds. If parameter value is 0, it will be ignored in sending algorithm.

Maximum Distance [m]

Default value	**5000**
Range	0, 10 to 200000
Remote command	**DT**
Description	Parameter of GPS position sending algorithm. New GPS position will **always** be sent if vehicle has travelled this distance from last sent position. Distance is entered in meters. If parameter value is 0, it will be ignored in sending algorithm.

Optimizer Sensitivity

Default value	**4**
Range	0 to 6

Remote command	**SS**
Description	This parameter is used to set up sensitivity of smart algorithm for sending GPS events to server. If lower number (sensitivity) is chosen device will send less data. Default value is 4. If 0 is chosen, smart algorithm will be turned off and device will send only on time and traveled distance.

SMS Geotag Format

Default value	**0**
Range	0 to 6
Remote command	**SGF**
Description	This parameter defines geo coordinate format in SMS alert messages. 0 - GeoSMS – default **geo:44.816965,20.471057** 1 - Degrees minutes seconds **geo:N44:49'0.00",E20:28'15.00"** 2 - Degrees minutes **geo:44:49.208N,20:28.2627E** 3 - Geo microformat - (X)HTML **44.816912;20.471077** 4 - Google Maps URL **http://maps.google.com/maps?q=44.816908,20.471087+(139)** 5 - OpenStreetMap URL **http://www.openstreetmap.org/?lat=44.816942&lon=20.471080&zoom=15&layers=M** 6 - Map Quest URL **http://www.mapquest.com/?q=44.817043,20.471045+(139)**

Crash Detection [mG]

Default value	**0**
Range	0, 125 to 16000
Remote command	**CD**
Description	This parameter is used to set up sensitivity for vehicle crash detection. Depending on vehicle type and device position this parameter has to be set up in range from 125 mG to 16000 mG. Higher number means less sensitivity. If parameter value is 0, then crash detection is turned off.

Movement Sensitivity [mG]

Default value	**0**
Range	0, 16 to 2000
Remote command	**MS**

Description	This parameter is used to set up sensitivity for movement detection when device is in power save mode (vehicle is not used). Depending on vehicle type and device position this parameter has to be set up in range from 16 mG to 2000 mG. Higher number means less sensitivity. If parameter value is 0, than this option is turned off.

Max Allowed Speed [km/h]

Default value	**0**
Range	0, 20 to 250
Remote command	**XS**
Description	This parameter is used to set up speed limit for overspeed event. If vehicle is moving faster than speed defined by this parameter, device will send overspeed event. Parameter value can be in range from 20 to 250 km/h. If parameter value is 0, than vehicle overspeed option is turned off.

10.5 Auxiliary Profile

Auto Command Time [min]

Default value	**20**
Range	0 to 35791394
Remote command	**AC1**
Description	This time defines minimal period in which Fox device will check for new commands on server via GPRS. If time defined by this parameter elapses, command will not be checked before device has something to send to server. Command check will not operate in power save mode. If value 0 is entered, device will never perform auto command check.

NOTE: This parameter is used when vehicle enters or leave out Geo-fence zone, depending on "Geo-fence zone sending profiles" parameter.

Strict Command Time

Default value	**Disabled**
Range	Enabled, Disabled
Remote command	**AS1**
Description	If this parameter is enabled, Fox device will check for new commands on server via GPRS when time defined by Auto Command Time parameter elapsed. Fox device will also check for new commands on server via GPRS on incoming voice call. If this parameter is disabled and time defined by Auto Command Time parameter elapsed, command will not be checked before

	device has something to send to server. Command check will not operate in power save mode.

NOTE: This parameter is used when vehicle enters or leave out Geo-fence zone, depending on "Geo-fence zone sending profiles" parameter.

Send GPS Position

Default value	**Enabled**
Range	Enabled or Disabled
Remote command	**SP1**
Description	GPS position send enable. If disabled, GPS position event (code 0) will not be sent. GPS position will be sent only with other events.

NOTE: This parameter is used when vehicle enters or leave out Geo-fence zone, depending on "Geo-fence zone sending profiles" parameter.

Send GPS Position When Ignition Key is Off

Default value	**Disabled**
Range	Enabled or Disabled
Remote command	**CS1**
Description	GPS position event send enable when ignition key is off. If parameter value is 1, sending of GPS positions event is enabled.

NOTE: This parameter is used when vehicle enters or leave out Geo-fence zone, depending on "Geo-fence zone sending profiles" parameter.

Send Events

Default value	**Enabled**
Range	Enabled, Disabled
Remote command	**SE1**
Description	Events send permission (open/closed door, battery empty...) by GPRS. If enabled, any change on enabled input pins will be sent via GPRS with corresponding event code.

NOTE: This parameter is used when vehicle enters or leave out Geo-fence zone, depending on "Geo-fence zone sending profiles" parameter.

Sending FMS Period [s]

Default value	**0**
Range	0, 10 to 600
Remote command	**SF1**

Description	FMS data send period. If parameter value is different from 0, all OBD II data received from external OBD II reader through serial port, will be sent to server in period defined by this parameter. If parameter value is 0, OBD II data will not be sent to server.

*NOTE: In order to setup serial port for receiving data from external ODB2 reader, parametar „**External device**“ (ED) must be setup to value **obd.***

NOTE: This parameter is used when vehicle enters or leave out Geo-fence zone, depending on “Geo-fence zone sending profiles” parameter.

SMS Alert Period [s]

Default value	**0**
Range	0, 10 to 1200
Remote command	**SA1**
Description	This parameter defines minimal time between two SMS alert messages. If this parameter value is 0, SMS alerts are off.

NOTE: This parameter is used when vehicle enters or leave out Geo-fence zone, depending on “Geo-fence zone sending profiles” parameter.

Overspeed Sending Treshold [s]

Default value	**60**
Range	10 to 1200
Remote command	**YS1**
Description	This parameter is used to set up period for overspeed event. Overspeed event will not be sent in period shorter than defined by this parameter.

NOTE: This parameter is used when vehicle enters or leave out Geo-fence zone, depending on “Geo-fence zone sending profiles” parameter.

Logger Mode

Default value	**1**
Range	1 to 3
Remote command	**LM1**
Description	1 - real time sending 2 - periodical in predefined time periods 3 - daytime period (at predefined daytime)

NOTE: This parameter is used when vehicle enters or leave out Geo-fence zone, depending on “Geo-fence zone sending profiles” parameter.

Logger Period [min]

Default value	**0**
Range	0 to 2147483647

Remote command	**LP1**
Description	Period for sending data from logger if logger mode 2 is used. Period is defined in minutes. Parameter will take no effect if value 0 is setup.

NOTE: This parameter is used when vehicle enters or leave out Geo-fence zone, depending on "Geo-fence zone sending profiles" parameter.

Logger Time [hh.mm]

Default value	
Range	ASCII
Remote command	**LT1**
Description	Time of a day (by UTC time) when logged data will be sent if logger mode 3 is used. It is allowed to enter several daytime values in ascending order separated by semicolon. Maximum string length for SMS command is 175 characters.

NOTE: This parameter is used when vehicle enters or leave out Geo-fence zone, depending on "Geo-fence zone sending profiles" parameter.

Logger Size Limit [kB]

Default value	**0**
Range	0 to 4096
Remote command	**LS1**
Description	Logger memory size limit. By this parameter maximal logger size is defined. When log is full, oldest data will be overwritten. If parameter value is 0, there will be no limit for logger memory size (i.e. logger memory size will take maximum value).

NOTE: This parameter is used when vehicle enters or leave out Geo-fence zone, depending on "Geo-fence zone sending profiles" parameter.

Maximum Time [s]

Default value	**300**
Range	0 to 2147483647
Remote command	**TO1**
Description	Parameter of GPS position sending algorithm. New position will **always** be sent if this time expires from last sent position. Time is entered in seconds. If parameter value is 0, it will be ignored in sending algorithm.

NOTE: This parameter is used when vehicle enters or leave out Geo-fence zone, depending on "Geo-fence zone sending profiles" parameter.

Maximum Distance [m]

Default value	**5000**
Range	0, 10 to 200000
Remote command	**DT1**
Description	Parameter of GPS position sending algorithm. New GPS position will **always** be sent if vehicle travels this distance from last sent position. Distance is entered in meters. If parameter value is 0, it will be ignored in sending algorithm.

NOTE: This parameter is used when vehicle enters or leave out Geo-fence zone, depending on "Geo-fence zone sending profiles" parameter.

Optimizer Sensitivity

Default value	**4**
Range	0 to 6
Remote command	**SS1**
Description	This parameter is used to set up sensitivity of smart algorithm for sending GPS events to server. If lower number (sensitivity) is chosen device will send less data. Default value is 4. If 0 is chosen, smart algorithm will be turned off and device will send only on time and traveled distance.

NOTE: This parameter is used when vehicle enters or leave out Geo-fence zone, depending on "Geo-fence zone sending profiles" parameter.

10.6 Roaming

Auto Command Time [min]

Default value	**20**
Range	0, 1 to 35791394
Remote command	**AC2**
Description	This time defines minimal period in which Fox device will check for new commands on server via GPRS. If time defined by this parameter elapses, command will not be checked before device has something to send to server. Command check will not operate in power save mode. If value 0 is entered, device will never perform auto command check.

NOTE: This parameter is used only when device is in roaming network.

Strict Command Time

Default value	**Disabled**
Range	Enabled, Disabled
Remote command	**AS2**
Description	If this parameter is enabled, Fox device will check for new commands on server via GPRS when time defined by Auto Command Time parameter elapsed. Fox device will also check for new commands on server via GPRS on incoming voice call. If this parameter is disabled and time defined by Auto Command Time parameter elapses, command will not be checked before device has something to send to server. Command check will not operate in power save mode.

NOTE: This parameter is used only when device is in roaming network.

Send GPS Position

Default value	**Enabled**
Range	Enabled or Disabled
Remote command	**SP2**
Description	GPS position send enable. If disabled, GPS position event (code 0) will not be sent. GPS position will be sent only with other events.

NOTE: This parameter is used only when device is in roaming network.

Send GPS Position When Ignition Key is Off

Default value	**Disabled**
Range	Enabled or Disabled
Remote command	**CS2**
Description	GPS position event send enable when ignition key is off. If parameter value is 1, sending of GPS positions event is enabled.

NOTE: This parameter is used only when device is in roaming network.

Send Events

Default value	**Enabled**
Range	Enabled, Disabled
Remote command	**SE2**
Description	Events send permission (open/closed door, battery empty...) by GPRS. If enabled, any change on enabled input pins will be sent via GPRS with corresponding event code.

NOTE: This parameter is used only when device is in roaming network.

Sending FMS Period [s]

Default value	**0**
Range	0, 10 to 600
Remote command	**SF2**
Description	FMS data send period. If parameter value is different from 0, all OBD II data received from external OBD-II reader through serial port will be sent to server in period defined by this parameter. If parameter value is 0, OBD-II data will not be sent to server.

*NOTE: In order to set up serial port for receiving data from external OBD II reader, parameter „**External device**" (ED) must be set up to value **obd.***
NOTE: This parameter is used only when device is in roaming network.

SMS Alert Period [s]

Default value	**0**
Range	0, 10 to 1200
Remote command	**SA2**
Description	This parameter defines minimal time between two SMS alert messages. If this parameter value is 0, SMS alerts are off.

NOTE: This parameter is used only when device is in roaming network.

Overspeed Sending Treshold [s]

Default value	**60**
Range	10 to 1200
Remote command	**YS2**
Description	This parameter is used to set up period for overspeed event. Over-speed event will not be sent in period shorter than defined by this parameter.

NOTE: This parameter is used only when device is in roaming network.

Logger Mode

Default value	**1**
Range	1 to 3
Remote command	**LM2**
Description	1 - real time sending 2 - periodical in predefined time periods 3 - daytime period (at predefined daytime)

NOTE: This parameter is used only when device is in roaming network.

Logger Period [min]

Default value	**0**
Range	0 to 2147483647
Remote command	**LP2**
Description	Period for sending data from logger if logger mode 2 is used. Period is defined in minutes. Parameter will take no effect if value 0 is set up.

NOTE: This parameter is used only when device is in roaming network.

Logger Time [hh.mm]

Default value	
Range	ASCII
Remote command	**LT2**
Description	Time of a day (by UTC time) when logged data will be sent if logger mode 3 is used. It is allowed to enter several daytime values in ascending order separated by semicolon. Maximum string length for SMS command is 175 characters.

NOTE: This parameter is used only when device is in roaming network.

Logger Size Limit [kB]

Default value	**0**
Range	0 to 4096
Remote command	**LS2**
Description	Logger memory size limit. By this parameter maximal logger size is defined. When log is full, oldest data will be overwritten. If parameter value is 0, there will be no limit for logger memory size (i.e. logger memory size will take maximum value).

NOTE: This parameter is used only when device is in roaming network.

Maximum Time [s]

Default value	**300**
Range	0 to 2147483647
Remote command	**TO2**
Description	Parameter of GPS position sending algorithm. New position will **always** be sent if this time expires from last sent position. Time is entered in seconds. If parameter value is 0, it will be ignored in sending algorithm.

NOTE: This parameter is used only when device is in roaming network.

Maximum Distance [m]

Default value	**5000**
Range	0, 10 to 200000
Remote command	**DT2**
Description	Parameter of GPS position sending algorithm. New GPS position will **always** be sent if vehicle travels this distance from last sent position. Distance is entered in meters. If parameter value is 0, it will be ignored in sending algorithm.

NOTE: This parameter is used only when device is in roaming network.

Optimizer Sensitivity

Default value	**4**
Range	0 to 6
Remote command	**SS2**
Description	This parameter is used to set up sensitivity of smart algorithm for sending GPS events to server. If lower number (sensitivity) is chosen device will send less data. Default value is 4. If 0 is chosen, smart algorithm will be turned off and device will send only on time and traveled distance.

NOTE: This parameter is used only when device is in roaming network.

Use GPRS in Roaming

Default value	**Disabled**
Range	Enabled, Disabled
Remote command	**RE**
Description	Sending data in roaming enable/disable option.

10.7 Power Save

Protection Level [mV]

Default value	**11000**
Range	*Range:* 50 to 36000
Remote command	**LVP**
Description	Vehicle battery under voltage protection. If vehicle battery voltage is lower than the specified value, the Main power voltage event was generated and over discharge option will be activated if ignition key off (see chapter 7.10).

Power Save Time [min]

Default value	**10**
Range	0 to 2147483647
Remote command	**UT2**
Description	This time defines time period for Fox Easy device to enter power save mode after ignition key is turned off. If this parameter has value 0 power save option is inactive.

Power Save Wake up Time [min]

Default value	**240**
Range	0 to 2147483647
Remote command	**UT5**
Description	This parameter defines wakeup time from power save mode. After wakeup device will operate for some time during which it sends regular position/status information and then it returns to power save mode.

Hibernation Enable

Default value	**Disabled**
Range	Enabled, Disabled
Remote command	**HE**
Description	Enabled or disabled hibernation state of power save mode.

Hibernate Time [h]

Default value	**96**
Range	0 to 2147483647
Remote command	**PW0**
Description	Time period when Fox Easy device enters to deep power save mode after ignition key is turned off.

Sending Timeout [s]

Default value	**600**
Range	0 to 2147483647
Remote command	**PW1**
Description	Time period when Fox Easy device tries to send position. After this time period device goes back to previous power save mode.

WDT Event Period in Hibernation [min]

Default value	**120**
Range	0 to 2147483647
Remote command	**PW2**
Description	Time period which defines when Fox Easy device will send WDT start events if device is in hibernation.

GPS Always On

Default value	**Enabled**
Range	Enabled, Disabled
Remote command	**UF8**
Description	If enabled, GPS module will be kept running while device is in power save mode. This will provide immediate GPS position fix after device wakeup. Otherwise it would take some time (in most cases less than one minute) for GPS receiver to get valid position, but power consumption in power save mode is about 20 mA less than if option is enabled.

Wake on GPIO Change

Default value	**Disabled**
Range	Enabled, Disabled
Remote command	**UF9**
Description	If enabled, device will wake up from power save on input pins change.

Ignore Ignition Key

Default value	**Disabled**
Range	Enabled, Disabled
Remote command	**IC**
Description	If enabled, device will ignore state of ignition key and Fox Easy device will operate as ignition key is on.

10.8 Trace

Parameters of trace menu are virtual parameters and they are used for device monitoring. Many of these parameters can only be read by command because writing has no effect.

Vext

Default value	virtual value
Range	ASCII
Remote command	**EXT**
Description	Main power voltage. Measure unit is V. Writing of this parameter has no effect.

*NOTE: This parameter is read only. Use remote command **RP:EXT** to get parameter value.*

Key

Default value	virtual value
Range	0 or 1
Remote command	**CON**
Description	Ignition key state. If 0 – ignition key is off, if 1 – ignition key is on. Writing of this parameter has no effect.

*NOTE: This parameter is read only. Use remote command **RP:CON** to get parameter value.*

Send SMS

Default value	virtual value
Range	ASCII
Remote command	**SMS**
Description	Send SMS via Fox Easy from Fox Configurator. Enter “full_phone_number;SMS_text“ and press write changes. SMS_text will be send to full_phone_number. Example: +38163559963;SMS text example.

Command

Default value	virtual value
Range	ASCII
Remote command	**CMD**
Description	Send command to Fox Easy from Fox Configurator. Enter the command and press write changes. If command is correct it will be executed.

FS Status

Default value	virtual value
Range	ASCII

Remote command	**FSS**
Description	Status of File System. Format of this parameter is “a,b,c“. “a“ can be 0- status error or 1- status ok, “b“ – file system free space, “c“ – file system full size. Writing of this parameter has no effect.

NOTE: *This parameter is read only. Use remote command **RP:FSS** to get parameter value.*

Net Info

Default value	virtual value
Range	ASCII
Remote command	**NET**
Description	GPRS network information. Format of this parameter is “a,IPV4_address“. “a “ can be 0 – modem disconnected or 1 – modem connected. “IPV4_address“- network IP address. Writing of this parameter has no effect.

*NOTE: This parameter is read only. Use remote command **RP:NET** to get parameter value.*

Modem IMEI

Default value	virtual value
Range	ASCII
Remote command	**IME**
Description	This parameter has value of GPRS modem IMEI.

*NOTE: This parameter is read only. Use remote command **RP:IME** to get parameter value.*

SIM IMSI

Default value	virtual value
Range	ASCII
Remote command	**IMS**
Description	This parameter has value of SIM card IMSI.

*NOTE: This parameter is read only. Use remote command **RP:IMS** to get parameter value.*

PIN Status

Default value	virtual value
Range	ASCII
Remote command	**PNS**

Description	SIM card PIN request status. If this parameter have “SIM PIN“ value, SIM card requests PIN code on start-up. If this parameter have “READY“ value, SIM card doesn’t request a PIN code. Writing of this parameter has no effect.

*NOTE: This parameter is read only. Use remote command **RP:PNS** to get parameter value.*

Power State

Default value	virtual value
Range	ASCII
Remote command	**PWS**
Description	This parameter returns value of device’s current power state. Possible values are: **WAKE, ON, STANDBY, SLEEP, SEND, FILTER, TOHIB, FHIB, DEBOUNCE, LOWV**.

*NOTE: This parameter is read only. Use remote command **RP:PWS** to get parameter value.*

GSM ID

Default value	virtual value
Range	ASCII
Remote command	**GNI**
Description	GSM network information. Writing of this parameter has no effect.

*NOTE: This parameter is read only. Use remote command **RP:GNI** to get parameter value.*

GSM Signal

Default value	virtual value
Range	ASCII
Remote command	**CSQ**
Description	This parameter present GSM signal quality. Writing of this parameter has no effect.

*NOTE: This parameter is read only. Use remote command **RP:CSQ** to get parameter value.*

Log Status

Default value	virtual value
Range	ASCII
Remote command	**LGS**

Description	Status of Fox Easy log. If 0 – log error, if 1 – log ok. Writing of this parameter has no effect

*NOTE: This parameter is read only. Use remote command **RP:LGS** to get parameter value.*

Log Buffer

Default value	virtual value
Range	ASCII
Remote command	**LGC**
Description	Number of bytes in log buffer. When buffer is filled, data is copied to log memory. Writing of this parameter has no effect.

*NOTE: This parameter is read only. Use remote command **RP:LGC** to get parameter value.*

Log Size

Default value	virtual value
Range	ASCII
Remote command	**LGZ**
Description	Number of unsent log pages. If this parameter is 0 there are no unsent events or positions. Writing of this parameter has no effect.

*NOTE: This parameter is read only. Use remote command **RP:LGZ** to get parameter value.*

Connections

Default value	virtual value
Range	ASCII
Remote command	**LGR**
Description	Number of successful network sockets open. Format of this parameter is “a,b“. “a“ – number of successful sockets open, “b“ – total number of retries. Writing of this parameter has no effect.

*NOTE: This parameter is read only. Use remote command **RP:LGR** to get parameter value.*

Speed [km/h]

Default value	virtual value
Range	ASCII
Remote command	**SPD**

Description	Vehicle speed, read from external device (OBD-II). If external device is not connected then vehicle speed is read from GPS.

*NOTE: This parameter is read only. Use remote command **RP:SPD** to get parameter value.*

GPS Position

Default value	virtual value
Range	ASCII
Remote command	**POS**
Description	*Description:* GPS position information. Format of this parameter is “a/b“. “a“ – latitude in minute of degree, “b“ – longitude in minute of degree. Writing of this parameter has no effect.

GPS Info

Default value	virtual value
Range	ASCII
Remote command	**GPI**
Description	GPS status information. Format of this parameter is “a/b/c/d“. “a“ – GPS fix number, “b“ – number of visible satellites, “c“ – estimated HDOP error, “d“ GPS module mark. Writing of this parameter has no effect.

*NOTE: This parameter is read only. Use remote command **RP:GPI** to get parameter value.*

GPS Time

Default value	virtual value
Range	ASCII
Remote command	**TIM**
Description	Time received from GPS module. Time format of this parameter is “DDMMYY-hhmmss“. Writing of this parameter has no effect.

*NOTE: This parameter is read only. Use remote command **RP:TIM** to get parameter value.*

Uptime

Default value	virtual value
Range	0 to 2147483647
Remote command	**UPT**
Description	Fox Easy working time since last regular start. Time is given in seconds. Writing of this parameter has no effect.

*NOTE: This parameter is read only. Use remote command **RP:UPT** to get parameter value.*

Checksum

Default value	virtual value
Range	ASCII
Remote command	**CHK**
Description	Checksum of current firmware version. Writing of this parameter has no effect.

NOTE: This parameter is not supported in current firmware version.

System Info

Default value	virtual value
Range	ASCII
Remote command	**HWV**
Description	Current system information. Writing of this parameter has no effect.

*NOTE: This parameter is read only. Use remote command **RP:HWV** to get parameter value.*

10.9 Phonebook Items

Configurator enables entering, deleting and assigning functions to phone numbers in phonebook. Phone numbers are entered in following form: **Name** (up to 12 characters), **Number** (up to 15 characters), **Flags** (up to 8 flags which define phone number functions).

11 Remote Parameter Change and Command Protocol

Fox Easy device can receive commands and parameter change messages remotely from mobile phone (or SMS gateway) using SMS messages or from server using GPRS.

11.1 Remote Parameter Change and Commanding using SMS

Commands can be sent by mobile phone or SMS gateway using SMS. Device will accept commands from SMS even if GSM parameters in device are not set.
In order to change parameters or to command device using SMS, SIM card in Fox Easy device must have enabled incoming SMS mesages.
Fox Easy device will process received SMS message and notify server about some actions.
When Fox Easy device receives and executes command via SMS, it will send response to sender phone number via SMS. If Fox Easy device receives commands FW, DR, RS, it sends response “X-started“ when command is activated (X is required command). If Fox Easy device receives commands MKP, MKF, DEL, DL it sends response “X-ok“ when command is correctly executed (X is required command). After setting parameters, Fox Easy device will send SMS with current value of changed parameters. For example, if Fox Easy receives SMS: **GE:0**, Fox Easy returns **GE=0** to sender.

*NOTE: If parameter can have **Enabled/ON** or **Disabled/OFF** value, to set **Enabled** or **ON** value send SMS command **X:1**, or to set **Disabled** or **OFF** value send SMS command **X:0**, where **X** is remote command for that parameter.*

NOTE: If parameter has to have no value, in remote command this value has to be under quotation marks. For example **SN:““**

SMS example: **GU:telenor,GP:gprs,GA:internet,UF9:1**

11.2 Remote Command Format

Remote commands are in ASCII format. Commands are not case sensitive. Remote commands are listed in chapter **Error! Reference source not found.** (Menu Items Description). Beside configuration commands, there are several executive and geofencing commands listed in following two lists.

Executive commands:

PP:<null> Sends one position. This command return the following parameters: ID, IP, POS, SPD, GPI, CON, DGI, SO1, SO2, EXT, GNI, TIM.

P:<null> Sends one position.

R:<null> Sends vehicle status.

RSS:<null> Restores device parameters from SIM card.

DL:<null> Deletes logger.

DR:<null> Sends data from logger (ignores roaming setting).

FW:<string1><string2> Firmware update command. <string1> is firmware update password, <string2> have format ”/i” where “i” is number of retrials (1 <= I <= 10)

NOTE: <string2> are not required, if <string2> missing number of retrials is 5.
EXAMPLE: ***FW:123456789/8***

RS:<n> Full device reset. After <n> seconds device will reset.

DEL:<null> Set up default parameters values.

FD:<null> Sends debug info. This command returns the following parameters: ID, IP, PD, GU, GP, GA, CP, RE, LM, UT2, BAT, GNI, CSQ, LGC, LGZ,GPI, TIM.

MKF:<null> Formats file system.

PBL: Reads all phones from phonebook (phonebook will be sent via GPRS to server only using event 210)

PBA: n ";" {<name> "," <number> "," <flags>";"} Adds phone to phonebook (0<n<=4)

NOTE: list of successfully added phones is sent to server using event code 211.
NOTE: Parameter <flags> has to be in two digit hexadecimal format. Meaning of each bit of this parameter is given in following table:

a (MSB) – GPS antenna open/short circuit,
b – Not supported
c – Crash
d – Not supported
e – Over-Speed
f – Panic
h (LSB) – Admin.

EXAMPLE: ***PBA:1;1,+381645555555,23;*** *– Crash, Geo-fence and Admin flags are turned on.*

PBR: n ";" {<name> "," <number>";"} Deletes phone from phonebook (0 <= n <= 4). If n is 0, phonebook format will be done (same as **MKP:** command).

NOTE: List of successfully deleted phones is sent to server using event code 212.

MKP:<null> Formats phonebook (delete all numbers from phonebook).

ZFA:<null> Shock/acceleration sensor calibration.

Remote Parameter Read

Parameter read commands are implemented for complete remote management. Command is implemented in ASCII format.

RP: <**Command Code**> , <**Command Code**> ,..., <**Command Code**>
This command will return only values of selected parameters.

NOTE: Commands are not Case Sensitive.

12 Appendix

1.1 Working Without Ignition Pin

Ignition pin can be in following modes:

a) Connected to ignition signal
b) Connected directly to car battery (12/24V)
c) Left floating

Mode "a": this mode is highly recommended. The device will be forced to enter selected power save mode immediately after the engine is turned off. Selected power saving mode is user configurable, and it may or may not put device to sleep or hibernation. The device will wake up very quickly after ignition key is moved from neutral position.

Mode "b": the device will never enter power save mode. Being always active it will draw more power from vehicle battery.

Mode "c": the device will be wake up from the power save mode by mechanical vibrations. These vibrations are picked up by the shock/acceleration sensor while the vehicle is moving. The device will enter power save mode after timeout measured from the last shock event. This timeout can be defined by user.

NOTE: Ignition key on/off events will not be sent in modes "b" and "c" for obvious reasons.

13 Technical Specification

13.1 Operation and Stock Conditions

Storage temperature ..... -40°C to +95°C
Operation temperature ..... -40°C to +85°C
Ratings ..... 9-36 Vdc

13.2 Digital Inputs Features

Digital inputs number (one is reserved for ignition key) 1

13.3 Analog Inputs Features

Analog inputs reserved for vehicle battery voltage 1
Analog input minimum voltage..... 0 V
Vehicle battery dedicated analog input maximum measurable voltage ..... 40 V
A/D converter resolution .....10 bit

13.4 GSM Module Features

Quad Band – GSM ..... 850/900/1800/1900 MHz
GPRS Multi-slot ..... Class 10/8
SIM slot ..... Micro SIM

13.5 GNSS Module Features

GNSS module chip-set ..... Sierra Wirelles SiRFstarV
GPS channels number.....52
GPS sensitivity ..... -160 dBm
GPS position precision ..... 2.5 m
GPS position acquisition time on trickle power save mode exit (open sky) .....1 s
GPS position acquisition time after cold start (open sky) ..... 28 s average
GPS data protocols ..... NMEA

13.6 Electric Power Consumption

Typical (GPS ON & GSM ON on VDD=12 V) ..... 25 mA
Sleep (on VDD=12 V)..... 3 mA
Hibernation (GPS OFF & GSM OFF on VDD=12 V)..... 0.45 mA
Vehicle battery protection when battery voltage is lower then the value specified by parameter **LVP** - low voltage protection (on VDD=12 V) ..... 0.45 mA

Other protections: reverse polarity, over voltage, under voltage.

13.7 Mechanical Features

Device dimensions (W x B x H) ..... 75 x 55 x 21 mm
Device weight ..... 50 g

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