TELEMATICS SERVICE

USER MANUAL

Version 1.0

www.orf-monitor4.com

TECHNOTON

Contents

Terms and Definitions

Fleet is an organizational unit of ORF4 telematics service. Fleet is a group of vehicles having the same operator. Each fleet has a unique title and a single administrator on ORF4 platform.

Service administrator is a Technoton engineer in charge of ORF4 operation. Service administrator provides Integrators with support to configure ORF4 for clients.

Fleet administrator is a user of ORF4 managing a Fleet. Has extended rights to add/delete Vehicles (units) and Fleet managers. Usually Fleet administrator is an Integrator of fleet Telematics System.

Analytical report data on Vehicle, group of Vehicles or on-board equipment operation in specified time period (e.g. day, week, month). Can contain figures, tables, diagrams, track images, etc.

On-board equipment is a hardware devices mounted on Vehicles.

On-board report — vehicle operational data specified according to the requirements of the Telematics System user. Tracking device generates reports at specified intervals (Periodic Report) or upon the occurrence of events (Event Report).

Geofences (geographic zones) certain areas marked on the map which are used to monitor the movement of the vehicle in these areas or outside.

Additional sensors — sensors which are not built-in from the factory (fuel level sensors, fuel flow meter, axle load sensor, etc.).

Integrator of telematics system is a person responsible for integration of Telematics System in particular Fleet. Integrator provides mounting and configuration of on-board equipment as well as Fleet configuration of ORF4.

Maps — area images used in ORF4 Telematics Service (Yandex Maps, Google Maps, Openstreetmap and others).

Track is a block of data containing location, speed and direction of movement of the vehicle. Track represents vehicle route and is displayed in the form of lines on the map. Vehicle movement direction is shown with arrows.

Fleet manager — one or several users of ORF4 Telematics Service whose rights are defined by Fleet Administrator. Usually Fleet Manager is a person responsible for operation of Telematics System of the fleet owner company.

Real-time window — ORF4 tool used for real-time monitoring of a particular vehicle.

Operational Data — data received from Vehicle in real time mode. Contains location and main operational parameters of the Vehicle. Operational data is updated on the server side as soon as fresh data becomes available.

Real-time Monitoring — remote real-time monitoring of Vehicle location and operational parameters.

Report Panel —ORF4 tool used for Post-trip Analysis of Vehicle or group of vehicles operation.

Parameter — Time-dependent characteristics of the Vehicle (speed, the amount of fuel in the tank, fuel consumption rate, location). The parameter is usually represented as a graph and the average value.

Post-trip Analysis — Vehicle operation analysis based on Analytical Reports for the specified time period.

Server — hardware and software used for processing and storage of on-board reports and generating and displaying analytical reports. Server has a static IP-address.

Event — relatively seldom and dramatic change of the Parameter value. For example, a rapid increase of fuel volume in the tank is a Filling event. Event can have one or several

characteristics. Filling event has the following: fuel volume before filling, fuel volume after filling, filling volume, etc. When event is detected tracking device records the time of the event. Event time is indicated in the event report. Event is always tied to the time and place of detection.

Profile of the Tracking device is a set of configurations for a tracking device. Usually is a external file (*.gcm for GALILEOSKY tracking devices and *.prf DUT-E GSM fuel level sensor). Profile can be saved into the tracking device with a service software (configurator).

Telematics System is a complete solution for online monitoring and Post-trip Analysis of Vehicle operation. Includes on-board equipment, data communication channels, office equipment and software.

Tracking device is a unit of Telematics System used for reading the signals of Vehicle standard and additional sensors, getting location data and transmitting the data to the Server.

Vehicle (unit) is an object which is monitored with the telematics system. In most cases it is a car, truck, tractor, bus or diesel locomotive, vessel, etc. From Telematics point of view it can be also a stationary installation: diesel generator, boiler, burner, etc.

Template of Analytical report is a sample of Analytical Report which can be generated with ORF4 Telematics Service for a particular Vehicle (or group of Vehicles) according to specified Parameters.

Template of On-board equipment is a list of preconfigured On-board equipment of the Vehicle. Template is used for Vehicle registration at ORF4 Telematics Service.

Standard Sensors — sensors mounted from the factory by Vehicle manufacturer (RPM sensor, speed sensor, door opening sensor, engine temperature sensor, oil pressure sensor, etc.).

Introduction

is a Telematics Service for Real-time monitoring **of** Vehicles **and** Post-trip Analysis **of their operation.**

ORF4 features:

- **Real-time fleet monitoring through web browser** from any computer, tablet or smartphone **without any additional software**;
- Templates of Analytical Reports allow to systematize and represent Vehicle data on fuel consumption and operational parameters in an easy-to-use form;
- Templates of On-board equipment provides an easier registration of Vehicles equipped with DFM fuel flow meters, DUT-E fuel level sensor and other Technoton devices;
- Profiles of the Tracking devices for GALILEOSKY allow to connect On-board Equipment and CAN bus under default input configuration of the tracker;
- server performance provides **simultaneous monitoring of up to 10 000 vehicles**;
- Real-time Windows provide effective monitoring of Vehicle location and operational parameters;
- **high-quality** technical support **worldwide**.

ATTENTION: It is strongly recommended to follow strictly the instructions of the present Manual when using the Service.

To ensure proper use of ORF4 Service, provide user access rights only to certified specialists who have passed corporate technical training.

ATTENTION: JV Technoton reserves the right to modify Service features that do not lead to a deterioration of the consumer qualities without prior customer notice

1 General information

1.1 Application

is designed for gathering of On-board reports through Internet, their processing and displaying of Operational Data on the area map as well as storage of data and generation of Analytical Reports at user request.

Application area — Telematics Systems.

ORF4 main functions:

- **Real-time monitoring of Fleet** — real-time monitoring of vehicle location and movement, current parameters monitoring (speed, RPM, oil pressure, engine temperature, fuel consumption, axle load, etc.), tracking of vehicle route following;
- **Fuel monitoring** — recording data on location, time and volume of fuel filings, detection of fuel draining (thefts), displaying actual fuel consumption values according to Vehicle data gathered from fuel sensors and CAN bus;
- **Post-trip analysis of Vehicle operation** — Analytical Reports can be built for single Vehicle as well as for group of Vehicles. The reports contain detailed information necessary for the effective Post-trip analysis of Vehicle operation by Fleet manager: operation time, parking place and time, fuel consumption, fuel fillings and drainings, route, speed, axle load, diagnostics and other parameters.

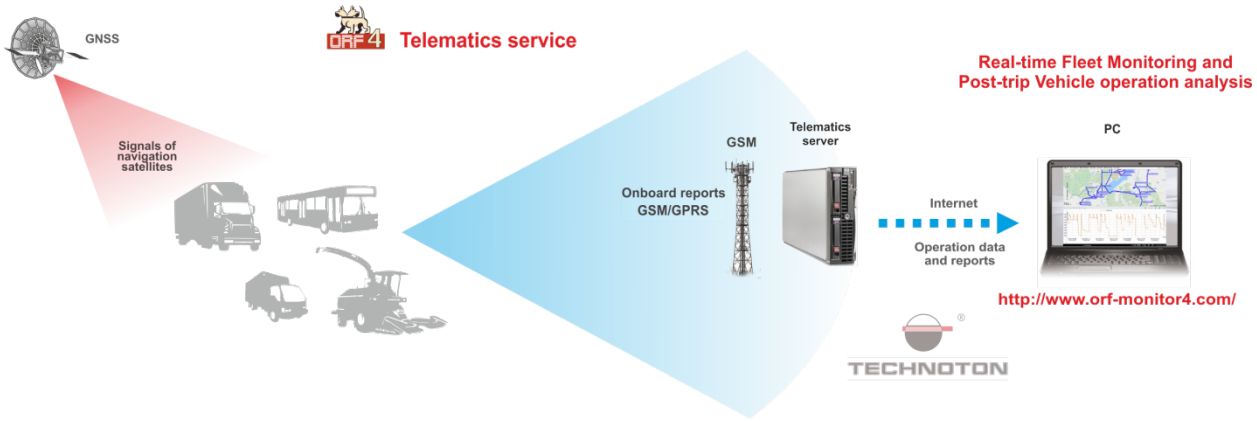

Figure 1 — ORF4 Telematics Service operation scheme

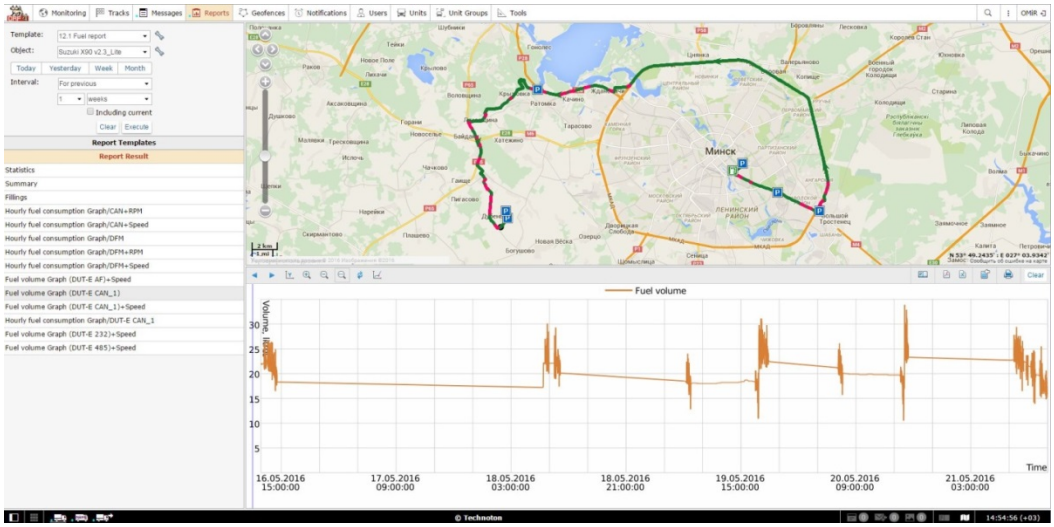

Figure 2 — snapshot of ORF4 analytical report on track and fuel volume of the fuel tank.

1.2 Access rights

Each user of ORF4 should have a unique login and password to enter the Service. User has a set of **access rights** defining his ability to see particular elements of the Service and perform actions.

Access rights are designated by Service Administrator with **account configurations** at control web-site http://manager.orf-monitor4.com/

Account contains all the user's data of the Service (Vehicles, groups of Vehicles, Geofences, Templates of Analytical Reports, created accounts). Account configurations allow to control client's payment balance and add payments. All account data is deleted when deleting the account.

Fleet is an organizational unit for a created account of ORF4 Service.

The same Fleet can has several users with different access rights.

User access rights:

1) Fleet administrator:

- Creation of Fleet account and configuration of Service for this Fleet;
- adding/editing/deleting Vehicles and groups of Vehicles;
- creating/editing/deleting Fleet Managers;
- creating/editing/deleting geofence areas and Event notifications;
- designation of Fleet Managers access rights;
- Vehicles and groups of Vehicles monitoring;
- geofences monitoring;
- viewing of Analytical Reports of Vehicles and groups of Vehicles.

2) Fleet manager:

- Vehicles and groups of Vehicles monitoring;
- geofences monitoring;
- viewing of Analytical Reports of Vehicles and groups of Vehicles.

1.3 Workspace system requirements

Here are system requirements for ORF4 Service correct operation:

- CPU minimum clock speed at 1.6 Hz
  (2.4 Hz recommended);
- RAM - 512 MB (recommended 2 Gb or more);
- At least 17" monitor;
- 1Mbit Internet connection;

One of the following Internet browsers is required:

- Google Chrome (version 38 and higher);
- Mozilla Firefox (version 21 and higher);
- Opera (version 10 and higher);
- Internet Explorer (version 9 and higher).

RECOMMENDATION: Antivirus software can slow down browser performance and data receiving from the Server. If it is getting slower just add http://www.orf-monitor4.com/ to antivirus exception list or disable antiviral monitoring during the time when ORF4 is running.

2 Configuration of ORF4 Telematics Service for a Fleet

ORF4 Service is configured for a Fleet by Fleet Administrator (see 2.1, 2.2, 2.3).

2.1 Vehicle registration

1) For vehicle registration enter the Service and click 

button in the Main menu of the Main Monitoring window (see 3.1, 3.2). Depending on the used Vehicle On-board Equipment select one of the Templates of On-board equipment at the Side Panel:

- **CAN Template** — for connection of:

  - Additional Sensors with CAN/RS-232/RS-485 interfaces (e.g. DFM CAN fuel flow meters, DUT-E CAN/232/485 fuel level sensors, etc.);
  - on-board CAN bus (with MasterCAN vehicle data intefaces);
  - Additional Sensors with analog/frequency/discrete output signals.

- **Analog Template** — for connection of:

  - Additional Sensors with analog/frequency output signals (DUT-E A5/A10/F/AF fuel level sensors, etc.);
  - Additional Sensors with pulse output signal (DFM AK/CK/D fuel flow meters, etc.);
  - Additional Sensors with discrete output signals .


ATTENTION: For a correct displaying of data in Analytical Reports delete sensors which are not used at **Sensors** tab of the selected Template for particular Vehicle.

2) Click  button next to selected Template of On-board equipment to create a copy. Fill the following fields at **General** tab of appeared **New Unit** window:

- **Name** — Vehicle name for its identification in the Service. Should contain from 4 to 50 symbols.
- **Device type** — select tracking device model out of the drop-down list.
- **Unique ID** —IMEI or serial number of the tacking device for Service identification.
- **Phone number** — phone number of SIM-card in international format.

3) Define access rights for Fleet Managers at **Access** tab (see 1.2) (**Read only** is recommended).

4) To create Unit Group click 

button of the Main Menu and then click 

button at the Side Panel. Group units in the appeared **New Unit Group** window. Insert a login for a group creator and define access rights for Fleet Managers (**Read only** is recommended).

2.2 Tracking device configuration

ATTENTION: to operate with ORF4 server vehicle should be equipped with GALILEOSKY Tracking device (v 2.3 Lite, v 2.3, v 5.0) or DUT-E GSM fuel level sensor.

1) Follow theinstructiond for GALILEOSKY tracking devices configuration:

a) Save Profile of the Tracking device into the tracking device. Contact Service Administrator at support@technoton.by to get a profile.

Profile can be saved with Configurator software according to instructions of tracking device operation manual.

b) At Configurator (Settings→Data transfer) insert Access Point (APN): **Name**, **Login**, **Password**.

To get these settings contact a GSM service operator of the used SIM-card.

c) Connect On-board Equipment and CAN bus to the tracking device using a default input configuration:

- **IN0** – RPM pulse signal (tachometer connection or W terminal of the generator);
- **IN1** – DFM fuel flow meter with pulse output, NozzleCrocodile contactless reader (threshold at 24 V power supply voltage is 6000 mV, at 12 V – 4000 mV);
- **IN2** – DUT-E AF fuel level sensor in a frequency output mode;
- **IN3** – GNOM axle load sensor
- **CAN** – connection of DUT-E CAN fuel level sensors (up to 2 units), MasterCAN CC (MasterCAN V-Gate) vehicle data interfaces or direct CAN bus connection.

ATTENTION:
1) In case of limited data plan it is recommended to disable unused inputs of the tracking device through Configurator software (menu Settings→Protocol tab).
2) If only a **single device** is connected to the tracker's CAN port (e.g. DUT-E CAN only or MasterCAN only) send a command code for CAN port activation '**activecan 1'** (Configurator→menu Settings→ Protocol tab).

2) DUT-E GSM fuel level sensor configuration for an operation with the Service is carried out with Service S6 DUT-E software according to DUT-E GSM operation manual. Configuration procedure:

a) Insert Internet connection settings in the correspondent fields of DUT-E GSM GPRS settings tab at Service S6 DUT-E software (PGN 63020): **GPRS Access point**, **Name**, **Password**.

To get these settings contact a GSM service operator of the used SIM-card.

b) Insert server connection settings at AVL settings tab of Service S6 DUT-E software (PGN 63068): **IP address**, **Port**, **Name**, **Password**.

To get the settings contact Service Administrator at support@technoton.by.

2.3 Linking Reports to Vehicle

Service has Templates of Analytical report included. On base of the Templates Analytical Reports on Fleet operation can be easily created:

- Vehicle report;
- Group report;
- On-board equipment performance report;
- Vehicle Passport.

To generate Analytical Report it should be linked to monitored Vehicle:

1) Click 

button of the Main menu (see 3.1, 3.2), select a required Template at the Side panel.

2) Click  button to create a copy and delete unnecessary report entries if there any.

3) Selected Template of Analytical Report can be added with tables and graphs, additional settings can be defined (statistics settings, geofences, addresses, etc.).

4) Select one of the values of **Type** drop-down list in the appeared **New Report Template** window:

- **Unit** — for analysis of single Vehicle data;
- **Unit Group** — for simultaneous analysis of several Vehicles data.

5) Click 

button for Analytical report binding to Vehicle or group of Vehicles.

ATTENTION: See Annex A for a list of Vehicle parameters used for Analytical reports.

3 Working with ORF4

3.1 Entering a Service

Type Service URL in the address bar of the browser: http://www.orf-monitor4.com/

- Enter user login and password at the authorization page, select interface language (see Figure 3).
- Click “Forgot your password?” link to restore a password.
- To enter as a different user insert your login and password and then click “Login as” and insert the login of the other user.

NOTE: When logging in as a different user, access rights will be limited by access right restrictions of this user.

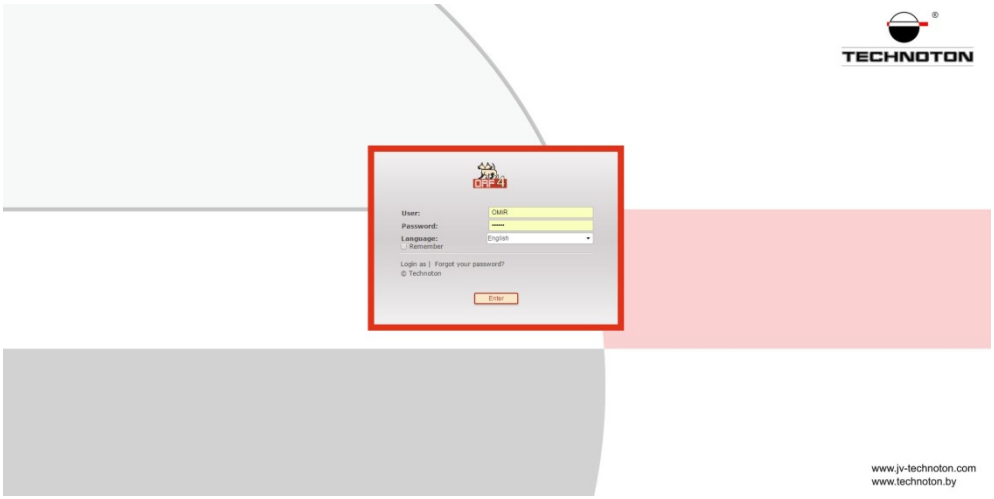

Figure 3 — Authorization window of the server

3.2 Main Monitoring window interface

The **Main monitoring window** is open since successful login (see Figure 4). Window is used for Real-time monitoring of Vehicles and to create and configure elements for Fleet monitoring (Vehicles , groups of Vehicles, Tracks, Reports, Geofences, Notifications, etc.).

Main monitoring window is split into the following areas:

- **Main menu** contains different elements depending on configurations and modules. Right side of the menu displays the login of the user used to enter the Service.
- **Side panel** is located at the left side of the window. Used for actions with monitored units if the Fleet. Depending on the selected Main menu entry, Side panel can display one of the following panels: Monitoring, Tracks, Reports, Geofences, Notifications, Users, Units, Unit Groups, Tools.
- **Map** displays Vehicles, Tracks, etc. Map scale can be adjusted with correspondent control buttons. Push F11 button to enter full screen mode.
- **Bottom panel** allows to show/hide work area panel (button), show/hide minimaps (button), contains buttons for configuration of Vehicle display mode on the Map. This panel also displays current time, log show/hide button and map source selection button .
- **Real-time window** appears when mouse pointer is hovered over the icon of Vehicle. It displays the latest message, location, geofence presence, speed, altitude, counters, number of visible navigation satellites, connection setting, Parameter values, etc.

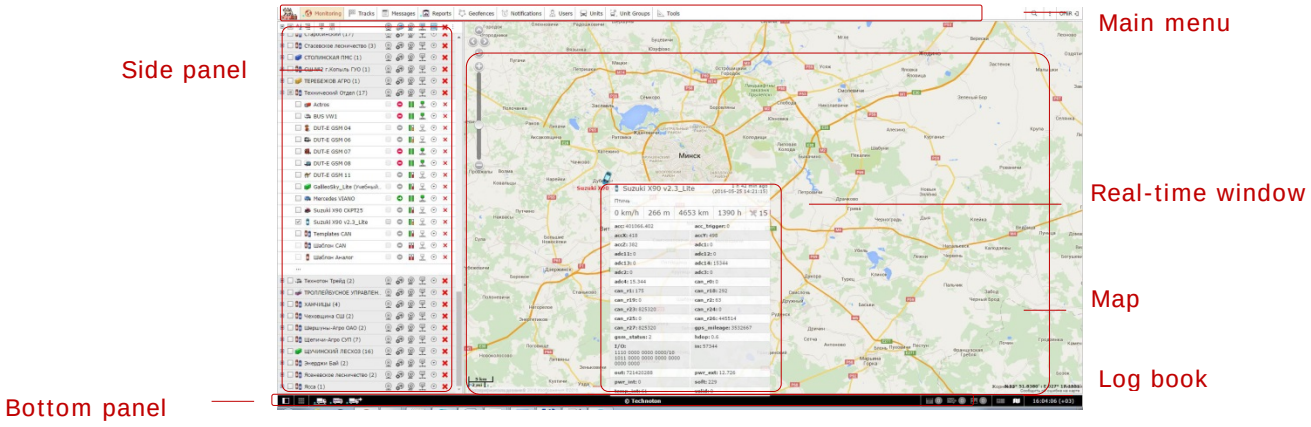

Figure 4 — Main monitoring window interface

To access the user preferences window, click button in the upper right corner of the Side panel. In the left column, tick the features that should be displayed. Select rarely used options in the right column and they will be placed into Additional menu (button in the upper right corner of the Side panel) (see Figure 5).

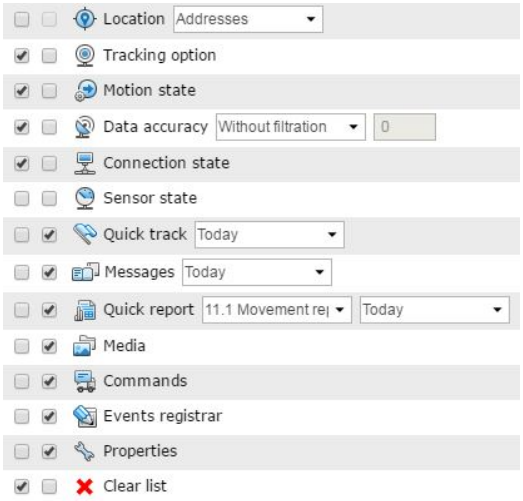

Figure 5 — Vehicle settings window

3.4 Real-time monitoring

For a real-time monitoring of Vehicles click Monitoring button of the Main menu. List of Vehicles available to the User will be displayed at the Side Panel.

The map will display only Vehicles marked with a tick in the Side Panel list. To select all the Vehicles of the Fleet tick the top check box. For a constant displaying of selected Vehicles on the Map tick 'Watch unit on map' check box.

To locate the Vehicle on the Map click its Name in the list. The Map will center its position according to Vehicle location. If the Vehicle is moving at this time the green arrow will indicate the direction and blue line will indicate a track. Track is not displayed for static Vehicles.

Real-time monitoring of the selected Vehicles can be effective with Real-time Windows. Such a window can be opened with a double click on Vehicle name in the Side Panel list or Vehicle icon on the Map.

Click on button at the top right area of Real-time Window to display a table with the current operational data: latest message time, location, speed, altitude, mileage, number of navigation satellites, connection setting, identification data, sensor values, etc. (see Figure 6).

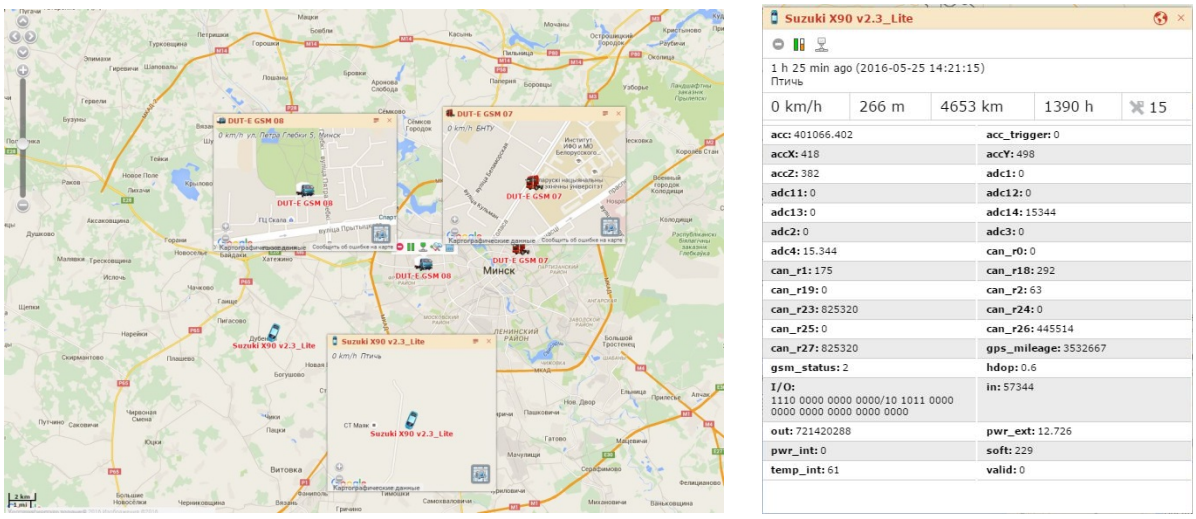

Figure 6 — Real-time Monitoring of Vehicle with Real-time Windows

3.5 Post-trip Analysis of Vehicle operation

For a Post-trip Analysis of Vehicle operation Service provides an ability to generate Analytical Reports for selected time interval specified by particular Vehicle, group of Vehicles and On-board equipment.

Analytical Reports may be be represented as graphs and tables. Reports can be viewed in a browser window, printed and exported in various file formats (HTML, PDF, EXCEL, XML, CSV). See Annex A for a list of available Reports and their contents.

To generate Analytical Report follow the instructions:

1) Click Reports button in the Main menu. Report Panel will be displayed at the Side panel.

2) Select a Unit out of **Object** drop-down list and a type of Analytical Report out of **Template** out of drop-down list at the Report Panel.

3) Click one of Today | Yesterday | Week | Month buttons to select a report interval.

For a specific selection of time interval use **Interval** drop-down list:

- **Specified Interval** — specify the start and end of the time period up to a minute.
- **Starts 'From' until today** — set only the beginning time. Current time will be automatically specified as the end of the interval.
- **For previous** — specify the number of previous days/weeks/months/years/hours. Tick the check box to include current period into report interval.

Click Execute button to generate a Report for a specified Interval.

Report	12.1 Fuel report
Object	Suzuki X90 v2.3_Lite
Report geneation time	25.05.2016 15:37:39
Time interval starts	16.05.2016 00:00:00
Time interval ends	22.05.2016 23:59:59
Milage	407 km
Movement time	9:24:35
Fuel consumption of engine/CAN	35.86 lt
Average consumption of engine/CAN	8.80 lt/100 km
Fuel consumption of engine/DFM	35.04 lt
Average hourly consumption of engine/DFM	3.24 lt/h
Average fuel consumption of engine/DFM	8.60 lt/100 km
Fuel consumption of engine/DUT	32.90 lt
Average fuel consumption of engine/DUT	8.07 lt/100 km

Figure 7 — Sample of Fuel Report for the month interval

Contacts

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support@technoton.by

Annex A
Contents of Analytical Reports Templates

Version 2.1

11.1 Movement report

Table
- Distance by GNSS, km (SPN 521126)
- Movement time by GNSS, hours, minutes (SPN 521127)
- Downtime with engine running, hours, minutes (SPN 521174)
- Average speed, km/h (SPN 517+2.1)
- Maximum Speed, km/h (SPN 517+2.1)
- Engine operation time, hours, minutes (SPN 247)
- Average engine RPM (SPN 190+2.1)
- Maximum engine RPM (SPN 190+2.7)

Graphs (horizontal axis is time)
- Speed, km/h (SPN 517)
- Engine RPM (SPN 190)
- On-board Power supply voltage, V (SPN 158)
- Engine coolant temperature, °C (SPN 110)
- Engine coolant level, % (SPN 111)
- Oil pressure, kPa (SPN 100)
- Actual engine torque, % (SPN 513)

12.1 Fuel report

Table
- Distance by GNSS, km (SPN 521126)
- Movement time by GNSS, hours, minutes (SPN 521127)
- Fuelling counter (SPN 521091)
- Filled fuel volume, l (SPN 521301)
- Probable fuel discharges counter (SPN 521092)
- Discharged fuel volume, l (SPN 521302)
- Vehicle fuel volume by the beginning of the time period /DUT, l (SPN 521193+24.0/data source)
- Vehicle fuel volume by the beginning of the time period /CAN, l (SPN 521193+24.0)
- Vehicle fuel volume by the end of the time period /DUT, l (SPN 521193+24.1)
- Vehicle fuel volume by the end of the time period /CAN, l (SPN 521193+24.1)
- Engine total fuel used/DUT, l (SPN 250)
- Engine total fuel used /DFM, l (SPN 250)
- Engine total fuel used /CAN, l (SPN 250)
- Engine fuel rate/DUT, l/h (SPN 183+2.1)
- Engine fuel rate/DFM, l/h (SPN 183+2.1)

Graphs

- Fuel volume (SPN 521193)
- Fuel volume + Speed (SPN 521193+ SPN 517)
- Engine fuel rate /DUT (SPN 183)
- Engine fuel rate /DFM+RPM(SPN 183+ SPN 190)
- Engine fuel rate /DFM+Speed (SPN 183+ SPN 517)
- Trip Fuel consumption (SPN 182)

13.1 Summary Vehicle report

Table

- Date
- Distance by GNSS, km (SPN 521126)
- Movement time by GNSS, hours, minutes (SPN 521127)
- Engine total hours of operation, hours, minutes (SPN 247)
- Downtime with engine running, hours, minutes (SPN 521174)
- Navigation-based vehicle speed, km/h (SPN 517+2.1)
- Engine total fuel used/DUT, l (SPN 250)
- Engine total fuel used /DFM, l (SPN 250)
- Engine total fuel used /CAN, l (SPN 250)
- Fuelling counter (SPN 521091)
- Filled fuel volume, l (SPN 521301)
- Probable fuel discharges counter (SPN 521092)
- Discharged fuel volume, l (SPN 521302)
- Engine fuel rate, l/h (SPN 183+2.1)

14.1 Alarm report

Table

- Event Date/Time (SPN 521300)
- Alarm message text (SPN 521016)
- Geocoding
- Vehicle Passport (PGN 63001)

Map

- Location of Alarm button triggering

Notification

- Online notification on Alarm button triggering
- E-mail notification on Alarm button triggering

15.1 Axle Overload report

Table

- Event Date/Time (SPN 521300)
- Geocoding
- Axle Weight, tons (SPN 582)

Graph

- Axle Weight, tons + Speed, km/h (SPN 582+SPN 517)

Notification

- Online notification on Axle Overload
- E-mail notification on Axle Overload

21.1 Group report

Table

- Vehicle name
- Distance by GNSS, km (SPN 521126)
- Movement time by GNSS, hours, minutes (SPN 521127)
- Navigation-based vehicle speed, km/h (SPN 517+2.1)
- Engine total fuel used/DUT, l (SPN 250)
- Engine total fuel used /DFM, l (SPN 250)
- Engine total fuel used /CAN, l (SPN 250)
- Fuelling counter (SPN 521091)
- Filled fuel volume, l (SPN 521301)
- Probable fuel discharges counter (SPN 521092)
- Discharged fuel volume, l (SPN 521302)
- Engine fuel rate, l/h (SPN 183+2.1)

31.1 On-board equipment performance report

Table

- GPRS Messages Counter (SPN 521140)
- GPRS traffic, Mb (SPN 521099)

Graph

- Satellites Quantity (SPN 521128)
- Horizontal Dilution Of Precision (HDOP) (SPN 521090)

Annex B
Installation of mobile application

Mobile app provides main functions of the Service for a convenient operation on a mobile device (smartphone or tablet):

- Vehicle location monitoring;
- status (movement, stop over, parking);
- ignition status (on/off);
- operational parameters monitoring;
- Events monitoring (movement, parking, fuel filling, fuel draining).

ATTENTION: Working with ORF4 mobile app can be performed only in native browser with cookie enabled.

Download the following application according to operating system of the mobile device:

- Android (smartphone)
- iOS (smartphone, tab)

To work with a mobile application type URL of the Service in the browser address bar: http://www.orf-monitor4.com/.

Enter your login and password at the authorization page.

After the successful authorization the mobile device will be listed at “Manage Applications” entry of the account (see figure B.1).

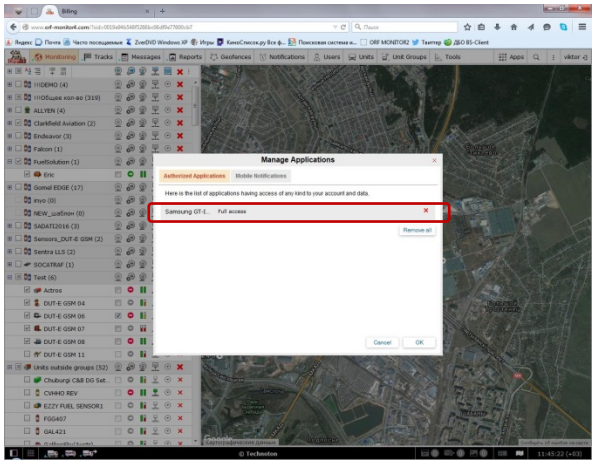

Figure B.1 — Mobile device is available at “Manage applications” list