



WEB-monitoring system

v.1.3

User Guide

monitor.fidtrace.com

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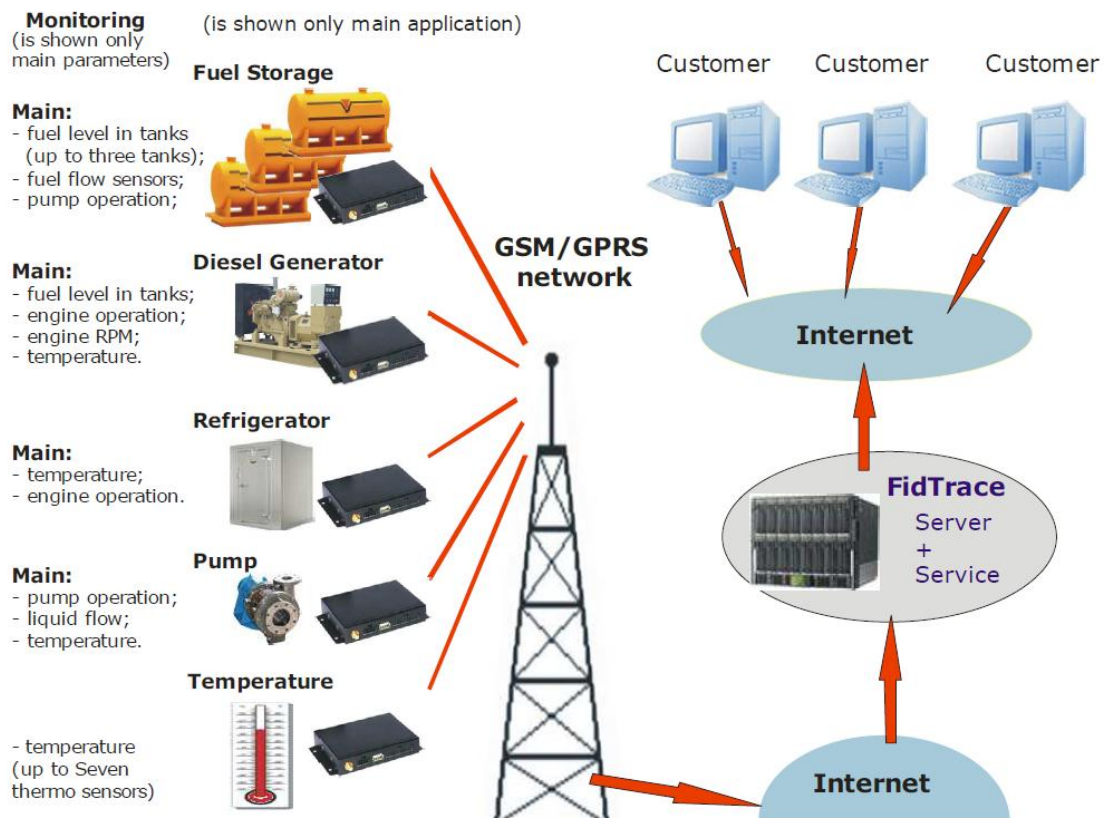
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Introduction

FidTrace is server-based software for collecting and monitoring data received from objects and sensors. The devices with sensors and mobile connection to Internet send data to the server that collects and monitors received data, generate alerts and reports.

This document is a short version of FidTrace user guide, to help users to understand FidTrace features and to use it. Another document – Administrator guide describes how to connect GuardMagic devices to FidTrace server, configure and customize settings.



The original concept of FidTrace monitoring system allows user to specify custom features of objects, monitored via **Sensors** and object-associated **Events** that provide all object features being monitored in most user-friendly form. FidTrace statistical reports provide highly consolidated data. Only if necessary the user may “drill-down” the reports and investigate more detailed data inside the report.

Sensors & Events

Three kinds of Sensors are used in FidTrace - continuous that “generate” continuous values (like fuel amount, temperature, speed etc.), logical with True/False state (ignition on/off, door open/close etc.), and virtual with continuous values, that are converted from “real” sensors via filtering or superposition of few sensors.

Continuous sensors are associated with following **Events**– “fuel extremely low”, “overheat”, when the value crosses the threshold. The thresholds may be set not only for the sensor value itself, but also for the rate of change of sensor value – for example “critically down” if the fuel consumption becomes abnormal, or “critically up”, if the level goes up too fast. Events “Up” and “Down” are generated automatically for each continuous sensor and used for statistical reports. For example the fuel level difference related to “up” event is just the Refueling amount.

Several events related to one continuous sensor may occur simultaneously (overlap) – e.g. “Critically Down” and “Low” Events, or “Down” and “Abnormally down”.

Events for logical sensors are just nicknames of its states – e.g. “Alarm” for “Door open”, or “In operation” for “Ignition on”.

There are three severity levels that can be assigned to any Event – Notification, Warning and Alarm. FidTrace will send an e-mail, voice message or perform other action according to the **Event** settings (see Administrator guide). All alerts are also recorded in the Electronic journal and may be viewed in the Alert & Notification

The Events above are related to Object (**Object Events**). **Hardware Events** are defined as logical ones related to the Device hardware and communication between the Object and monitoring server – like “Sensor failure”, “Communication problem”, “MainPowerAlarm” etc. Similar user interfaces are used for both Object and Hardware events that makes the diagnostics procedures simple and user-friendly.

Appendix 1 has a full list of predefined Object and Hardware related Events.

FidTrace Administrator creates a hierarchical tree of object structure (organization units & associated objects), devices and sensors (see details in Administrator guide). In monitoring and report mode the sensors are shown just under objects as its physical properties. The following notification of each sensor is used in FidTrace:

Enterprise/OrgUnit Level-1/OrgUnit Level-2/.../Object/Sensor.

In Demo version this will look like this: Demo/Demo Region 1/Demo-Area/Object 1/Diesel.

Fidtrace interface

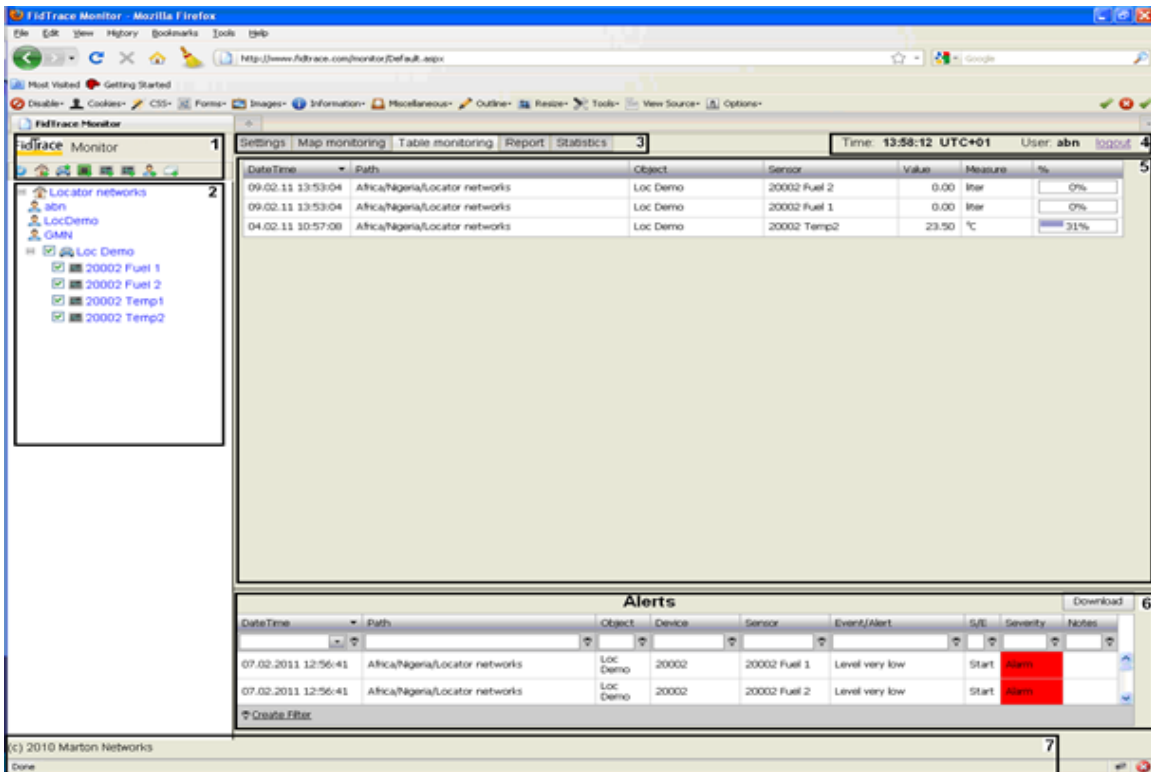
There is a special demo-mode in FidTrace with the following User & Password - **User: demo/Password: demo** that will be used in this document to show all FidTrace monitoring features in monitor.fidtrace.com. Information about connection of devices, configuration and customization is subject of Administrator guide. A Demo user has limited ability to do this and the settings are not saved after logout.



The login form is titled "Login" and contains the following elements:

- A heading: "Please login first"
- A "User Name:" label followed by a text input field.
- A "Password:" label followed by a text input field.
- A checkbox labeled "Remember me next time".
- Two buttons: "OK" and "Forgot Password".

After successful login you may see FidTrace screen with three main areas:



The screenshot shows the FidTrace Monitor web interface in a Mozilla Firefox browser. The interface is divided into several sections:

- 1. Left Sidebar:** A tree view showing the navigation structure. It includes "Locator networks", "sdn", "LocDemo", and "GMN". Under "LocDemo", there are four items: "20002 Fuel 1", "20002 Fuel 2", "20002 Temp1", and "20002 Temp2".
- 2. Main Content Area:** A table displaying monitoring data. The table has columns for "DateTime", "Path", "Object", "Sensor", "Value", "Measure", and "%". The data rows are:

DateTime	Path	Object	Sensor	Value	Measure	%
09.02.11 13:53:04	Africa/Nigeria/Locator networks	Loc Demo	20002 Fuel 2	0.00	lter	0%
09.02.11 13:53:04	Africa/Nigeria/Locator networks	Loc Demo	20002 Fuel 1	0.00	lter	0%
04.02.11 10:57:00	Africa/Nigeria/Locator networks	Loc Demo	20002 Temp2	23.50	°C	31%
- 3. Alerts Section:** A table at the bottom showing alerts. It has columns for "DateTime", "Path", "Object", "Device", "Sensor", "Event/Alert", "S/E", "Severity", and "Notes". The data rows are:

DateTime	Path	Object	Device	Sensor	Event/Alert	S/E	Severity	Notes
07.02.2011 12:56:41	Africa/Nigeria/Locator networks	Loc Demo	20002	20002 Fuel 1	Level very low	Start	Alarm	
07.02.2011 12:56:41	Africa/Nigeria/Locator networks	Loc Demo	20002	20002 Fuel 2	Level very low	Start	Alarm	

(1-2) Left side – “add new items” bar, tree navigation and details checkboxes.

(3-5) Central upper area – control bookmarks and appropriate content (settings, map monitoring, sensor charts and statistics reports).

Note: There is one more bookmark “transactions” (Manager actions) that is hidden in Demo mode.

(6) Central lower area – a list of Alerts and Events (latest on top), that may be sorted and filtered.

In order to resize the areas it is necessary just to click and drag the borders. All information on screen is refreshed after user intervention or just periodically (in 30-60 s).

The hierarchical tree of object structure implements the icons of organization units 🏠 & associated objects 🚗, devices 📡 and sensors 📊 (see details in Administrator guide). The device icons are visible only when “Settings” bookmark is active, in monitoring and report mode the sensors are shown just under objects as their physical properties. Sensor icons also indicate the nature of sensor – logical sensor 📊 (door, ignition, electricity on/off etc.), continuous sensor 📊 (fuel consumption, temperature, voltage etc.). Virtual sensor 📊 is a function of one or more continuous sensors (filtered fuel, superposition of few fuel sensors in a big tank, etc.).

The checkboxes on the left of each sensor icon are used to select the sensors that will be shown in main screen frame:

- In “Table monitoring” mode as a list of last values of each selected sensor,
- In “Report charts” mode as charts of selected sensors value versus date/time in selected date/time interval.
- In “Statistics report” mode as a table of all events related to selected sensors in selected date/time interval, as well as all attributes of these events,
- “Map monitoring” mode allows observing selected objects (with at least one sensor selected) as tags on geo-map.

Report templates with icon 📄 (below the tree) are used to summarize selected sensors/objects/orgunits in order to choose in advance necessary sensor templates. For example, we may define one group with all U95 fuel sensors (named “95-all”) on one or many tanks and another group with all Diesel fuel sensors (named “Diesel-all”).

There are also operator icons 👤 (allowed only to view information) and administrator icons 👤 (allowed to change settings and to create new items)

inside the tree. In fact such user is viewing the full sub-tree he/she has access to, including the icons of other users with access to sub-trees below their icons.

Note: Manager and administrator icons cannot be seen by a normal user, since they are above given user in the hierarchical tree.

Checking Devices & Sensors

After a Device with one or more Sensors is configured in FidTrace it is possible to look for alerts (like “Device disconnected” or “Sensor not active”) in Alert window, but there is also a simpler way – to use “Table monitoring” of appropriate sensors that of course should be ticked in the tree.

The font color of sensor data indicates the status of Device – if the Device is currently connected, the color is black and otherwise the color is red.

DateTime [dd/mm/yy]	Path	Object	Sensor	Value	Units	%
16.03.10 08:19:01	Asia/Mongolia/Mondulaan	MDT LLC	Түгээгүүрийн сав 2	36519.35	Liter	71%
16.03.10 08:19:01	Asia/Mongolia/Mondulaan	MDT LLC	Түгээгүүрийн сав 1	50705.88	Liter	98%
13.03.10 08:26:05	Asia/India/Advait Systems	Baghchand	T1-300	500.00	Liter	100%
	Asia/Mongolia/Mondulaan	MDT LLC	Түлшний банк - Талбайн гэрэлтүүлэг	---	(Liter)	0%

The Date/Time column indicates Date & Time of last message arrived from this sensor. In case this field is empty it means that information from this sensor never arrived.

This allows users to do a simple check of communication Sensors - Device as well as Device – Server.

Map & Table monitoring

Map monitoring mode is a simple way of monitoring several objects with many sensors on them. Each object with at least one sensor selected is represented as a tag on geographical map. The user may manually choose the optimal zoom and area on the map in FidTrace screen in order to see all or some objects.

When the user places mouse pointer on the tag a small window shows the latest values of selected sensors along with the Date/time stamp. After a sensor generated an alarm, the icon on map will change color according to event severity.

Color may be red, yellow or green according to the “worst” state of sensors and devices on this object (Alarm - red, Warning - yellow, other - green).

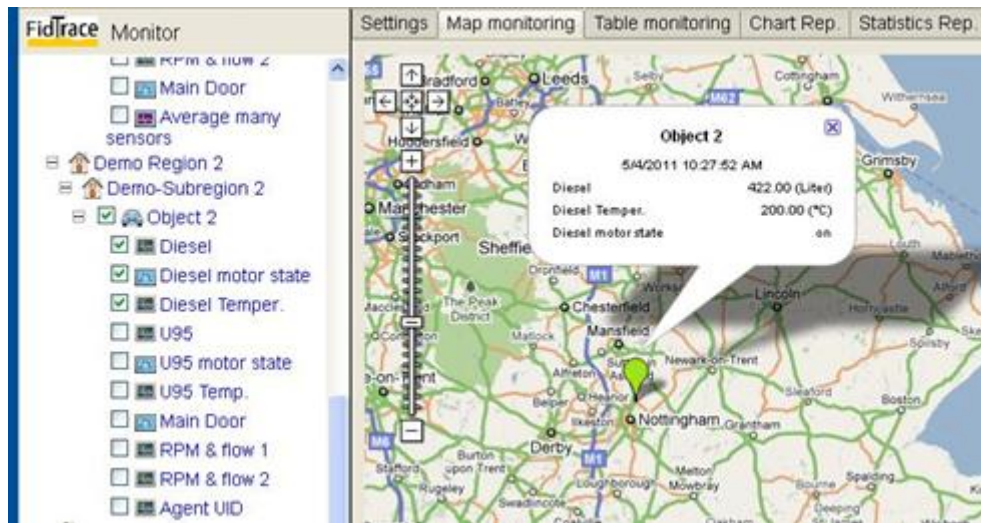


Table monitoring allows viewing latest values of selected sensors along with its Date/Time stamp and sensor path (OrgUnit(s), Object, Sensor). When looking at logical sensors one can see only the state, and when looking at continuous sensors one can see not only the value and measuring units, but in the last column - also the rate in % of its maximum value. The color of last column reflects the severity of pending event for each sensor.

DateTime	Path	Object	Sensor	Value	Measure	%
05.05.11 19:52:00	Demo/Demo Region 2/Demo-Subregion 2	Object 2	U95 Temp.	200.00	°C	71%
05.05.11 19:52:00	Demo/Demo Region 2/Demo-Subregion 2	Object 2	U95	578.00	liter	57%
05.05.11 19:52:00	Demo/Demo Region 2/Demo-Subregion 2	Object 2	Diesel Temper.	200.00	°C	71%
05.05.11 19:52:00	Demo/Demo Region 2/Demo-Subregion 2	Object 2	Diesel	542.00	liter	53%
05.05.11 19:52:00	Demo/Demo Region 1/Demo-Area	Object 1	Diesel Motor state	on		
05.05.11 19:52:00	Demo/Demo Region 1/Demo-Area	Object 1	U95 Temp.	200.00	°C	60%
05.05.11 19:52:00	Demo/Demo Region 1/Demo-Area	Object 1	U95 Ignition	on	w	
05.05.11 19:52:00	Demo/Demo Region 1/Demo-Area	Object 1	U95	358.75	liter	36%
05.05.11 19:52:00	Demo/Demo Region 2/Demo-Subregion 2	Object 2	Diesel motor state	on		
05.05.11 19:52:00	Demo/Demo Region 1/Demo-Area	Object 1	Diesel	525.00	liter	52%

Alerts

Alerts frame displays different kinds of alerts (notifications, warnings and alarms) along with date/time and full path of alert source. Hardware alerts related to equipment & communications are also displayed. The S/E flag indicates alert Start and End.

Alerts								Download
Date/Time	Path	Object	Device	Sensor	Event/Alert	S/E	Severity	
03.05.11 10:04:00	Demo/Demo Region 1/Demo-Area	Object 1	1193046	U95	Level high	End	Warning	
03.05.11 05:20:00	Demo/Demo Region 1/Demo-Area	Object 1	1193046	U95	Level high	Start	Warning	
03.05.11 05:20:00	Demo/Demo Region 1/Demo-Area	Object 1	1193046	U95	Critical up	End	Alarm	
03.05.11 05:20:00	Demo/Demo Region 1/Demo-Area	Object 1	1193046	U95	Abnormal up	End	Warning	
03.05.11 05:16:00	Demo/Demo Region 1/Demo-Area	Object 1	1193046	U95	Need refueling	End	Warning	
03.05.11 05:16:00	Demo/Demo Region 1/Demo-Area	Object 1	1193046	U95	Level very low	End	Alarm	
03.05.11 05:12:00	Demo/Demo Region 1/Demo-Area	Object 1	1193046	U95	Critical up	Start	Alarm	
03.05.11 05:12:00	Demo/Demo Region 1/Demo-Area	Object 1	1193046	U95	Abnormal up	Start	Warning	
02.05.11 23:04:00	Demo/Demo Region 1/Demo-Area	Object 1	1193046	U95	Level very low	Start	Alarm	
02.05.11 16:40:00	Demo/Demo Region 1/Demo-Area	Object 1	1193046	U95	Need refueling	Start	Warning	
01.05.11 16:56:00	Demo/Demo Region 1/Demo-Area	Object 1	1193046	U95	Level high	End	Warning	
01.05.11 07:48:00	Demo/Demo Region 1/Demo-Area	Object 1	1193046	U95	Overflow	End	Warning	
01.05.11 05:12:00	Demo/Demo Region 1/Demo-Area	Object 1	1193046	U95	Overflow	Start	Warning	

[Object] Is like 'object 1%' And [Sensor] Equals 'u95' Clear

Table is divided into pages. Clicking on column header and on a small triangle on the right of this header will invert **sorting** sequence. The blank fields below column headers allow filtering the data as shown in the picture above for “object 1” and “u95”. Advanced filtering (with many filtering options) may be done when clicking on key icons of selected columns. The script in the line below the table will indicate full filtering conditions.

Note: It is possible to turn some of the event actions off (for non-critical events for example) by choosing “Off” option for corresponding event in sensors “Event Settings” tab, under the “Settings” bookmark.

Chart and Statistics reports

Both report bookmarks – Chart & Statistics allow viewing information related to sensors that are selected in the left column tree structure or via predefined Group.

Three ways of selecting the Date/Time interval are used in both reports –

- **N Previous** days/weeks/months, without the pending day/week/month.
- **N Last** days/weeks/months, including current day/week/month -- up to the moment of generating the report.
- **Time interval** (Start Day/time DD/MM 00:00, End Day/time DD/MM 23:59).

It is necessary to press “Refresh” after the interval was entered. The selected interval is preserved for both Chart and Statistical reports.

Chart report

Chart report is just a chart of selected sensor values in predefined Date/Time interval. In the picture below we may see four thresholds and appropriate events

– “Overflow”, “Level high”, “Need refueling” and “Level very low”, but there is also date/time of events listed in the table below the chart, corresponding to sensor value reaching their thresholds in appropriate direction (for event start or event end).

The **Download** button allows to export, save, view and print reports via Adobe Acrobat reader (.pdf), WEB-browser (.html) or Excel viewer (.xls).

Note: There are also **Download** buttons available in Alert and other frames.

In the snapshots below you may see a sample of corresponding frames with Alerts, Chart report and Statistics report, related to one sensor and same Date/time interval.



Statistics report

The Statistics report is one of the most important features of FidTrace as it produces all information related to the **Objects and** that is aggregated by sensors, dates, events, values into a table with three main areas (see screenshot below) – Column definition area, Raw definition area, Value area.

Settings | Map monitoring | Table monitoring | Chart Rep. | Statistics Rep. | Time: 15:19:17 UTC+02 DST | User: User Demo

Events: Object | Interval type: Time interval | 30.04.11 00:00 - 03.05.11 23:59 | Refresh | Download | Options | Field settings

Statistics Rep. 30.04.11 00:00 - 03.05.11 23:59
Object: Demo/Demo Region 1/Demo-Area/Object 1aaaa

Drop Filter Fields Here

Filter area		Raw definition area				Raw subtotals	
Count & Duration	Value definition area	Month	Day	area		subtotals	
Sensor	Event type	April	May	May Total	Grand Total		
		30	1	2	3		
Abnormal up			1		1	2	2
Critical up			1		1	2	2
Down		1	2		1	3	4
Level high		1	1		1	2	3
Level very low				1	1	1	1
Need refueling			1	1	1	2	2
Overflow			1		1	1	1
Up			1		1	2	2
U95 Average		15:26:00	07:36:30	09:24:00	04:11:12	06:42:24	07:44:00
U95 Count		2	8	2	5	15	17
U95 Max		29:00:00	36:44:00	12:36:00	15:48:00	36:44:00	36:44:00
U95 Min		01:52:00	00:08:00	06:12:00	00:08:00	00:08:00	00:08:00
Grand Total		2	8	2	5	15	17

The Column definition area on the left usually contains the list of selected sensors as well as all types of Events that occurred with these sensors during selected date/time period.

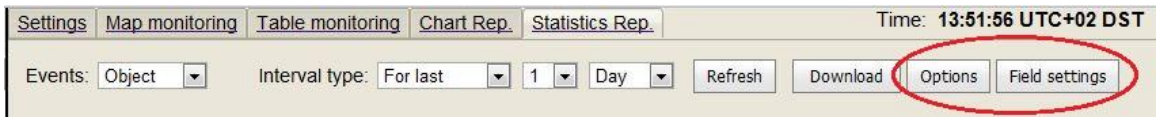
The Raw definition area on top of the Data Table may contain Year(s), Month(s) and Date(s) in selected interval. We can also use just Year or Month if we don't wish to see the events per days.

A small triangle on the right of the raw & column fields show sorting sequence and allows invert it. The small square in the Column and Raw fields with a triangle inside allows filtering the data.

In order to hide details in rows and/or columns user may click on the small square to the left of field value (e.g. sensor name, month). For example, user may click on "May" square in order to hide details related to May 1, 2, and 3.

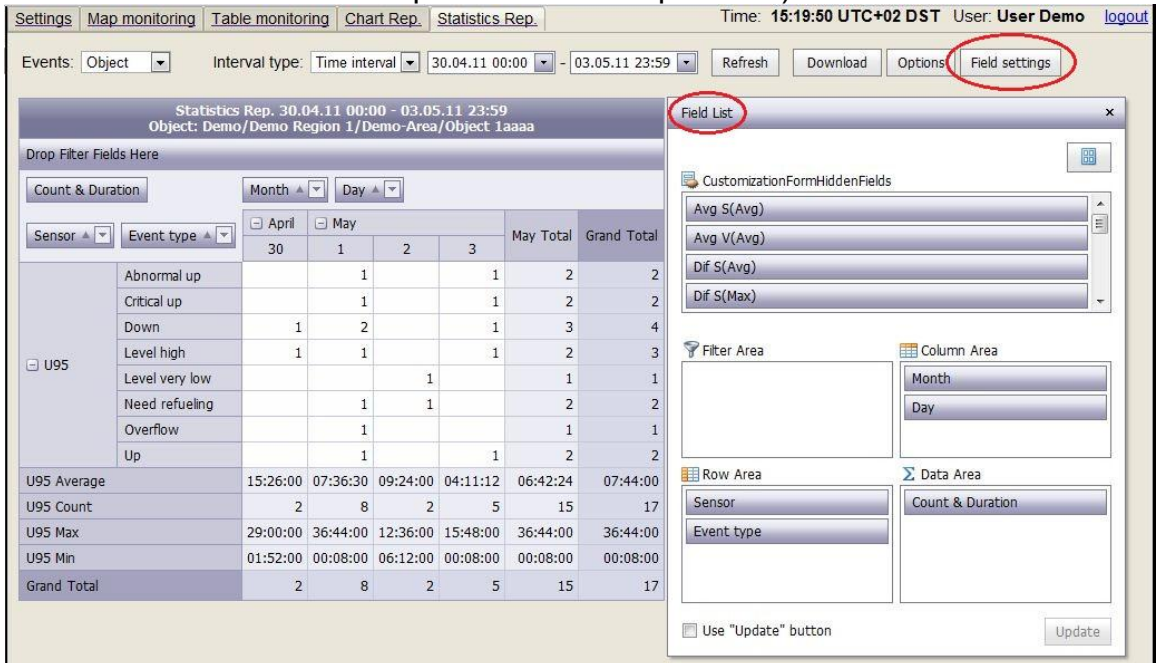
Options button on the top right side of Statistics Reports tab provides an opportunity to show/hide custom and grand totals of rows& columns. Also there is an option to change First&Last events restricted type (interval, events itself) and to customize the report header.

It is possible to generate reports with a variety of functions from Field List, which is displayed when clicking on the Field Settings button (next to the Options).



„Field Settings” tab is saved when “Update” button is pressed (first “use “Update” button” checkbox must be ticked).

(For tabs Chart Rep, Statistics Rep or Transactions, interval is saved only, if prior to that button “Refresh” on top of the tree was pressed.)



The Value definition area is indicating what kind of sensor information we want to aggregate in the table.

You may drag & drop the fields between Column, Row and Value definition areas and the Field list in order to produce an appropriate report.

In the snapshots below we'll demonstrate this report for one Value, but it is possible to consolidate several Values from Value List in one report.

Statistics Rep. 30.04.11 00:00 - 03.05.11 23:59
Object: Demo/Demo Region 1/Demo-Area/Object 1aaaa

Drop Filter Fields Here		Month		Day		May Total	Grand Total
Sensor	Event type	April	May	1	3		
U95	Down	-503.75	-951.63	-314.5	-1266.13	-1769.88	
	Up		746.13	713	1459.13	1459.13	
U95 Average		-503.75	-68.5	199.25	38.6	-51.79	
U95 Count			1	3	2	5	
U95 Max		-503.75	746.13	713	746.13	746.13	
U95 Min		-503.75	-713	-314.5	-713	-713	
Grand Total		-503.75	-205.5	398.5	193	-310.75	

The FieldList window on the right contains some functions of Sensor values (marked as S), Sensor value change rate (marked as V) and Event duration (marked as T) – Dif (difference), Min (minimum), Max (maximum) and Avg (average value). Using the mouse you may drag any of these icons into or outside of Value and other areas, and the appropriate report will be generated. The abbreviation in brackets shows how the values are summarized in the report.

There are 14 available data types and aggregations in Data Field List:

Group	Short name	Description
Event Day/Time	Dif T (Min)	Minimum value of event durations
	Dif T (Max)	Maximum value of event durations (for example – max. duration of all “Critically down” events aka fuel thefts)
	Dif T (Avg)	Average of event durations (for example – average duration of refueling or “Abnormal up” events)
	Dif T (Count)	Total count of events (for example – count of “Abnormal up” events aka refueling)
Event-related Sensor Values	Min S (Min)	Minimum value of sensor minimum value for chosen events (for example – minimum fuel level value for all “Critically low” events)
	Min S (Avg)	Average value of sensor minimum values for chosen events (for example – average of minimum fuel level values for all “Critically low” events)
	Max S (Max)	Max value of sensor maximum value for chosen events (for example – maximum fuel level value for all “Critically high” events)

	Max S (Avg)	Average value of sensor maximum value for chosen events (for example – average of maximum fuel level values for all “Critically high” events)
	Dif S (Min)	Minimum value of sensor value difference on End & Start for chosen events
	Dif S (Max)	Maximum value of sensor value difference
	Dif S (Avg)	Average value of sensor value difference
	Avg S (Avg)	Average value of sensor average value for chosen events
Change speed	Avg V (Avg)	Average value of rate of change of the sensor value during each of chosen event (for example – average fuel consumption in l/sec during events “Abnormal down”)

Statistics Rep. 30.04.11 00:00 - 03.05.11 23:59
Object: Demo/Demo Region 1/Demo-Area/Object 1

Drop Filter Fields Here

Count & Duration Month ▲ ▼ Day ▲ ▼

Sensor ▲ ▼ Event type ▲ ▼

		April	May	May Total	Grand Total
		29	1	3	
U95	Down	1	2	1	4
	Overflow		1		1
	Up		1	1	2
U95 Min		29:08:00	00:08:00	00:08:00	00:08:00
U95 Max		29:08:00	36:44:00	35:36:00	36:44:00
U95 Average		29:08:00	11:20:00	17:52:00	13:30:40
U95 Count		1	4	2	7
Grand Total		1	4	2	7

In the snapshot above the data is consolidated by **Count & Duration** of events, and you may see that the sensor U95 for the selected 3 days generated 7 events of 3 types, including one “Overflow” event on May, 01.

This overflow may be seen as a peak on the chart, and may be seen in event in the last two lines of Alert list (start – 01/05/11 05:12:00, end – 01/05/11 07:48:00) in the alert table screenshots below.



Overflow event starts - 01/05/11 05:12:00, ends – 01/05/11 07:48:00

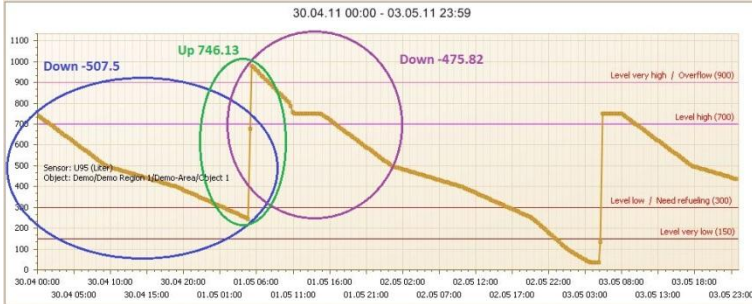
01.05.11 05:16:00	Demo/Demo Region 1/Demo-Area	Object 1	1193046	U95 Ignition	On	Start	Information
01.05.11 05:12:00	Demo/Demo Region 1/Demo-Area	Object 1	1193046	U95	Overflow	Start	Warning
01.05.11 05:12:00	Demo/Demo Region 1/Demo-Area	Object 1	1193046	U95	Level high	Start	Warning
01.05.11 08:44:00	Demo/Demo Region 2/Demo-Subregion 2	Object 2	8000001	Diesel	Level low	Start	Warning
01.05.11 07:48:00	Demo/Demo Region 1/Demo-Area	Object 1	1193046	U95	Overflow	End	Warning
01.05.11 07:24:00	Demo/Demo Region 2/Demo-Subregion 2	Object 2	8000001	Main Door	Close	Start	Warning

Alert list warnings.

Other examples:

- Dif S (Avg) means that the report will show an average of sensor value change between Event start and end, for fueling events this will be the average fueling amount.

Statistics Rep. 30.04.11 00:00 - 03.05.11 23:59						
Object: Demo/Demo Region 1/Demo-Area/Object 1						
Drop Filter Fields Here						
Dif S(Avg)		Month	Day			
Sensor	Event type	April	May	May Total	Grand Total	
		29	1	3		
U95	Down	-507.5	-475.82	-691	-547.54	-537.53
	Up		746.13	713	729.57	729.57
	U95 Min	-508	-713	-691	-713	-713
	U95 Max	-508	746	713	746	746
	U95 Average	-508	-69	11	-37	-115
	U95 Count	1	3	2	5	6
	Grand Total	-507.5	-68.5	11	-36.7	-115.17



- Max S (Max) – the maximal value of sensor maximal values during each event, for overheating events this will be the maximal temperature.
- Dif S (Sum) – the sum of sensor value changes, for “up” and “down” fuel sensor events, this will be the total fueling amount and total consumption.

Statistics Rep. 30.04.11 00:00 - 03.05.11 23:59
Object: Demo/Demo Region 1/Demo-Area/Object 1

Drop Filter Fields Here

Dif S(Sum) Month ▲ ▼ Day ▲ ▼

		April	May		May Total	Grand Total
		29	1	3		
U95	Down	-507.5	-951.63	-691	-1642.63	-2150.13
	Up		746.13	713	1459.13	1459.13
U95 Min		-508	-713	-691	-713	-713
U95 Max		-508	746	713	746	746
U95 Average		-508	-69	11	-37	-115
U95 Count		1	3	2	5	6
Grand Total		-507.5	-205.5	22	-183.5	-691

So many available functions allow users to choose a consolidation, that is most suitable for the selected sensor or object feature – users might be interested to know average (consumption) values, minimal or maximal (fuel) volume etc.

When clicking on the Statistic Report tab, previous Report is displayed by default, meaning that if for some reason user closed tab, he will not have to consolidate all of the data again when he chooses to go back.

Note 3: The **Object** data field may be added to the left side of Column definition area, if the Sensor names do not allow distinguishing Objects (see below)

Similarly the **Year** data field may be added to the left side of Raw definition area in case of generating reports with year changing date inside. For example, the report for 1.11.2009 – 31.01.2010 without “Year” field will have the sequence (January, November, December) instead of (December, January, February).

The **Download** button allows exporting, saving, viewing and printing all reports

with Adobe Acrobat reader (.pdf), WEB-browser (.html) or Excel viewer (.xls).

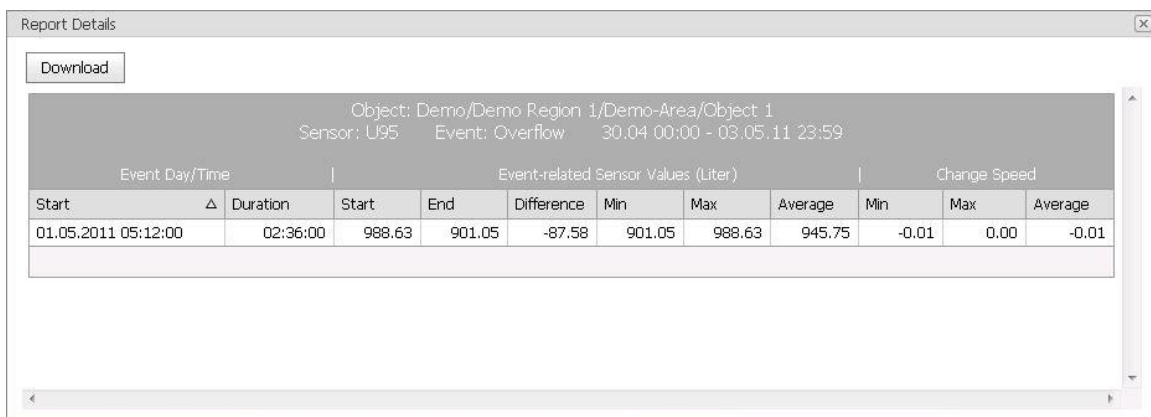
Note 1: We suggest the users to change only Value areas on the early stages of working with FidTrace and before they get a good understanding of this technology.

Note 2: The statistical report uses event nicknames like “Overfueling”, “Overheat”, “Fuel drain” if set in Sensor settings, otherwise standard event names like “Critically Low” are used.

Note 3: Sensor value change rate is calculated per second.

Drill-down

Clicking on the Value cell corresponding to this Overflow event on May,01 (with 1 inside), allows user to get more detailed information (“drill-down”) about each event in this aggregation, including event duration and sensor values on event start, event end, as well as min, max and average values during the event:



The screenshot shows a window titled "Report Details" with a "Download" button. The main content area displays the following information:

Object: Demo/Demo Region 1/Demo-Area/Object 1
Sensor: U95 Event: Overflow 30.04 00:00 - 03.05.11 23:59

Event Day/Time		Event-related Sensor Values (Liter)							Change Speed		
Start	Δ	Duration	Start	End	Difference	Min	Max	Average	Min	Max	Average
01.05.2011 05:12:00		02:36:00	988.63	901.05	-87.58	901.05	988.63	945.75	-0.01	0.00	-0.01

Each row of this Drill-Down table corresponds to an Event in selected Date/time interval.

Similarly, clicking on the Value cell corresponding to Grand Total of “Down” event (with 4 inside), provides more detailed information (“drill-down”) about all these events, including fuel consumption, time between refueling etc.:

Report Details

Download

Object: Demo/Demo Region 1/Demo-Area/Object 1
 Sensor: U95 Event: Down 30.04.00:00 - 03.05.11 23:59

Event Day/Time		Event-related Sensor Values (Liter)				Change Speed					
Start	Δ	Duration	Start	End	Difference	Min	Max	Average	Min	Max	Average
30.04.2011 00:00:00		29:00:00	750.00	242.50	-507.50	242.50	750.00	464.76	-0.01	-0.01	-0.01
01.05.2011 05:16:00		05:52:00	988.63	750.00	-238.63	750.00	988.63	883.46	-0.04	-0.01	-0.01
01.05.2011 14:56:00		36:44:00	750.00	37.00	-713.00	37.00	750.00	395.88	-0.01	-0.01	-0.01
03.05.2011 08:08:00		15:51:59	750.00	59.00	-691.00	59.00	750.00	405.70	-0.01	-0.01	-0.01

For more details regarding Drill-Down reports see Appendix 2.

Reports of Logical Sensors

As the logical Sensors have only two states, the associated reports are much simpler.

In Alert journal the events can be seen just as nicknames of states – e.g. “Alarm” as nickname of “Door open”. The charts in Chart reports have only two values, and only “Count & Duration” and “Dif T” (duration) data fields are applicable in Statistics report.

Only the first two cells of Drill-Down table are defined for logical sensors– Start Day/Time and Dif T (Duration). Other values have no meaning, but all sensor events are collected in one table in order to allow data consolidation in one report. For example, it is useful to count or compare state and duration of different events like “Gate Open” Logical Sensor and “Critically Down” Fuel sensor.

Report shows states of logical sensors rather than the associated events – for example we can get full statistics related to opened and closed doors, contacts, ignition etc.

The sample report below shows both Continuous sensors (Fuel 1) with events “Level High”, “Level very low” etc. as well as Logical sensor (Main Door L7) with events/states “Open”, “Close”.

The values are Event “Count & Duration”, “Average” fuel level.

Interval type: For previous 1 Week Refresh Export To: PDF Save

Drop Filter Fields Here

Dif T(Count) Avg S(Avg) Month Day

Sensor Event type


		24		25		May Total		Grand Total	
		Dif T(Count)	Avg S(Avg)	Dif T(Count)	Avg S(Avg)	Dif T(Count)	Avg S(Avg)	Dif T(Count)	Avg S(Avg)
Fuel 1	Level high	1	231.7			1	231.7	1	231.7
	Level low			1		1		1	
	Level very high	1	231.7			1	231.7	1	231.7
	Level very low			1		1		1	
Fuel 1 Max		02:07:10	231.7	16:23:27		16:23:27	231.7	16:23:27	231.7
Fuel 1 Min		02:07:10	231.7	16:23:27		02:07:10		02:07:10	
Fuel 1 Average		0	231.7	0		0	115.85	0	115.85
Fuel 1 Count		2	2	2	2	4	4	4	4
Main Door (L7)	Close	4		5		9		9	
	Open	4	1	4	1	8	1	8	1
Main Door (L7) Max		17:09:43	1	23:44:46	1	23:44:46	1	23:44:46	1
Main Door (L7) Min		00:00:02		00:00:03		00:00:02		00:00:02	
Main Door (L7) Average		0	.5	0	.44	0	.47	0	.47
Main Door (L7) Count		8	8	9	9	17	17	17	17
Grand Total		10	46.74	11	.36	21	22.45	21	22.45

PivotGrid Field List

- Avg V (Avg)
- Dif S(Avg)
- Dif S(Max)
- Dif S(Sum)
- Dif T(Avg)
- Dif T(Max)
- Dif T(Min)
- Max S(Avg)
- Max S(Max)
- Min S(Avg)
- Min S(Min)
- Start S



The Object/Hardware switch allows to get reports & statistics related to all hardware events – like Main Power failure, Communication failures etc.

Management of Report Templates

The users may save the frequently used report templates under appropriate names (like Favorites in Windows). These templates will be available as icons  below the Object tree that will carry all current settings - selected sensors/objects, time interval, fields and settings, event category (object/hardware) and date/time interval. A specific name should be assigned to each template that will allow easily identify report in the future.

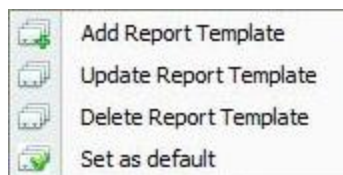
Report template management may be done by users as well as by administrators, therefore it is important to know template owner/creator, as well as the scope of template.

New report templates may be created in following ways:

- Right clicking in the organization tree and choosing “Add Report Template” (corresponding icon )
- Using  icon on top of the organization tree

New template will carry all report settings that are visible on screen or were used last time. In order to create a slightly different new report template you may just create a report with an existing template, change the report settings and create a new template that will inherit current settings.





Right-clicking on an existing Report Template icon  will open a menu:



As seen in the picture above, menu allows user to add new, delete or update current template. Report template with the “set as default” flag enabled will be used for the first report after user logs in. Next reports will be based on the previously saved templates.

Note 1: For chart reports the templates carry only report header, sensors/ objects and time interval.

Note 2: If “Previous” or “Last” days/weeks etc. time interval was set, then real interval is calculated according to current day/time.

Note3: Templates without any selected sensors are colored red , public templates are colored blue , and personal templates - gray . And template that is set as default will be shown with ticked icon, i.e. .

When clicking on the template icon all preselected sensors will be shown and used for observation. To edit/change the sensor group it is necessary just to “Save” Report Template settings after modifying the checkboxes.

The user may set his Report Template as public, i.e. accessible by all users in the branch (OrgUnit) by selecting “Is Public” checkbox. This feature is particularly useful when creating template(s) that will be used by other users as well.




The “OrgUnit” field allows to change the parent and make the public template available to bigger or smaller user group (according their access rights and placement in the tree).

As the template icons are arranged flat rather than in the tree, it is necessary sometimes to see the “owner” of the template (who was the last person updating the template), and what is the parent OrgUnit the template belongs to. This information is shown when the mouse points to the template icon.

Note 1: Administrators and managers have access to all templates (created by users or managers that are beneath them in object tree) that were made Public.

Note 2: Only User who created public template or user from the higher position in the hierarchy tree can delete such public template.

Note 3: If a user has no access to some or all objects/sensors in the public template created by another administrator or user, then the template will not include these items. If the user has no access to all sensors, the template will be shown in red color .

Appendix 1 - Object & Hardware Events

Event name	Default level	Notes
Main object events		
Level very high	Alarm	
Level high	Warning	
Level low	Warning	
Level very low	Alarm	
CriticalUp	Alarm	
AbnormalUp	Warning	
AbnormalDown	Warning	
CriticalDown	Alarm	
Up		
Down		
On	Information	
Off	Information	
Hardware events		
Main power on	Data collect information	
Device disconnected	Data collect information	
Sensor is not calibrated	Data receive alarm	
Parameter ID of virtual sensor not exist	Data receive alarm	
Not enabled or not configured	Data receive alarm	
Error state	Data receive alarm	
Time stamp of device not valid	Data receive alarm	
Device connection timeout error	Data receive alarm	
Hardware diagnostics		
Wrong packet control value	Alarm	For intern use (hidden)
Wrong device protocol type	Alarm	
Wrong device type	Alarm	For intern use error (hidden)
Unrecognized device factory number	Alarm	
Wrong packet length	Alarm	
Accept client failure	Alarm	
Receive_socket_exception	Alarm	

Send socket exception	Alarm	
Unrecognized device number	Alarm	
Wrong type of packet	Alarm	
Wrong type of record	Alarm	
Error in table server options of db	Alarm	
Sensor table dont have required record in db	Alarm	
Wrong or unrecognized device IP	Alarm	
Unrecognized connector	Alarm	
Global Exception	Alarm	
Threshold ID of virtual sensor not exist	Alarm	
Send&Receive information	Information	

Appendix 2 - Drill-Down reports

The following columns are defined in Drill-Down reports:

Group	Column name	Column abbreviation	Description
Event Day/Time	Start	Start	Starting Day/Time of an event (Note 1)
	Duration	DifT	Event duration in HH,MM,SS or DD,MM,YY (Note 2).
Event-related Sensor Values	Start	StartS	Start sensor value
	End	EndS	End sensor value (Note 2).
	Difference	DifS	Difference between end & start values (Note 2).
	Min	MinS	Minimal value
	Max	MaxS	Maximal value
	Average	AvgS	Average value
Change speed	Min	MinV	Minimal speed of Sensor value changes during the Event (value/sec)
	Max	MaxV	Maximal speed of Sensor value changes during the Event (value/sec)
	Average	AvgV	Average speed of Sensor value changes during the Event (value/sec)

Notes:

1. There are two options to show Start D/T for Events that started before the selected Day/Time interval – TimeInterval or EventItself.
2. The cell is blank if the event is still active.