

User Manual Project website:

PROTECTION OF SR POPULATION AGAINST THE EFFECTS OF ELECTROMAGNETICS FIELDS

INTRODUCTION:

The Project Protection of the SR population against the effects of electromagnetic fields ran in the period 01/2011 to 09/2015. The aim of the project was to make maps of the exposure to electromagnetic fields (EMF) for selected cities of SR.

BASIC PARTS:

The webpages are divided into three main parts:

- Information provides basic information about the project, the issue of electromagnetic fields, the methods used for the assessment of the exposure to the electromagnetic field and used input data.
- Maps these pages were designed to show created maps of the exposure to electromagnetic fields for each city included in project. Here it is also possible to display information about measurement, transmitters, as well as a summary of the realized monitoring of electromagnetic fields.
- Photographs contain selected photo documentation of instruments and their testing, measuring cars, monitoring stations and transmitters. Pictures are classified into several categories, but only a part of the chosen photo is displayed. The entire image is displayed just after the clicking on the selected image.



The map of the Slovak Republic is displayed as the home page. (Fig. 2).

Each part of the page is available by clicking on the hyperlinks displayed at the top on the left. (Fig. 1).

MAPS:

This part of the webpage uses the service of Google Maps, which is available on the Internet for the public use. The JavaScript code i sused here to control it. The JavaScript code adapts the function of the map pages to the special project requirements through the application programming interface. The code of the

page uses the standards of HTML5 version, which results to the requirements for the used browser. The browser must have the JavaScript enabled and also be able to view the pages of "the fifth generation". For this reason, it is still preferable to use the latest version of the browser, in which would not be any problem with viewing the pages.

As it turned out the Google Chrome is the best one to use, but also using the Opera, or the Mozilla Firefox does not bring problems. Complications can occur by using the Internet Explorer and therefore it is recommended to use another browser for displaying the maps of electromagnetic fields. The images from The Google Chrome and the Opera browsers were used in the part called "Instructions". Therefore, these images can slightly differ from the actual display in another type of the browser.



Fig.2 – Home page



BASIC DESCRIPTION:

After opening the pages on the left side of the homepage the list of regions is displayed. The link to this tutorial is situated under this list. The main information area is dedicated to map of Slovakia showing the cities that were included in the project. Marks representing the selected cities are of different colour according to the particular region. (Fig. 2).

The Instructions button is situated right above the map of Slovakia. Click the button to display the manual for instructions on how to use the website. The map shows all the regions, or only one selected with the mouse pointer in the menu on the left side of the page. After clicking on any of the regions displayed in this menu, the list of the cities of the relevant region occurs in the menu. (Fig. 3).



Fig. 3 – List of cities grouped by region.

List of the cities in selected region is sorted in an alphabetical order. Below this list there is a link "Back to Slovakia", which is equivalent to the hyperlink "Maps" in the top menu (Fig. 1), or to reloading of the page. Clicking this link will return the entire display back to choice of the region selection. After selecting the desired city the page will update in the map area of the page (Fig. 4). Some of the large cities are additionally divided into smaller parts, and an update of data in the map area will occur after the selection of some of these smaller parts. Individual cities can be chosen also by clicking on the label of the selected city on the map of Slovakia.

Selecting the city:

Name of the selected city is marked in black colour font, which differs it from the names of other cities in the menu. (Fig. 4).



Fig. 4 – Page displeyed after selecting the city.

The panel called "Display the Layers" is situated below the list of the cities.

It contains the controls that allow you to switch the display of individual map layers. The map of intensity of electromagnetic field is set up as the basic display after the selection of a particular city. The activity of the switches and display layers depends also on the zoom level of the map. Some functions are available only after a specific zoom.

Accessible control is marked in black font. Also the button "Measurement" displays above the map and is used to detect the calculated values of the electric field on the map directly under the cursor, and the "Panorama" button to toggle the current display mode of the map.



Legend:

At the right edge there is the legend (Fig. 4), that displays the colour range and the corresponding level of the electric field in V/m. It is common for all cities and it does not change after choosing another city. The information about the year of validity of displayed map of electromagnetic field is shown under the legend.

Map area:



It is the most important part of the page. It displays the calculated value of intensity of the electric field of the particular town in a colour according to the legend. The layer of the electric field intensity can display or hide by using the "EMF Map" button. The button is located on the control panel on the left side next to the map. There is only the basic map provided by Google Maps under the layer

of the electric field intensity. The display style of this map can be set by clicking the buttons Satellite, Map Map Satellite OpenStreetMap or respectively OpenStreetMap in the upper right Fig. 6 – Style of map corner (Fig. 6). The satellite images are shown directly by a satellite view. The standard map with



Fig. 5 - Shift and zoom of map.

streets, rivers, mountains, roads, borders, labels, etc. is shown by viewing a map style or style OpenStreetMap. The change of the map style can be either by sufficient zoom out, or by turning off the layers of the electric field.

Shift and zoom, respectively zoom outof the map can be done not only byt using the mouse but also by using the controls on the left side of the map field (Fig. 5).

Next layers:

Besides the electric field intensity there is even a layer of transmitters, buildings, roads, measurement points and a layer of monitoring stations on the base of a Google Maps layer.

Each of these layers can be arbitrarily switched on and off by pressing the relevant button on the control panel. The result of a different layers

Podhradova Stred Veľká Ida	á Transmitters:	Akvar X
vychod	All Transmitters	
Back to Slo	Va 🕑 VKV-FM 🕑 F-OFDM	?
Displa	ay GSM 900 GSM 1800	Ŷ
EN	AF UMTS 2100	Ŷ
Mo	nit MMDS 1	× N
Tran	sn 🖉 Wimax	6
Roads	Uther transmitters	Y
Points of N	leasurements.	Googl

Fig. 8 - Manage transmitters layer

combinations is a significantly better orientation on the map. Position of the monitoring station AMS8060 is

represented by its own icon on the map (Fig. 7). After clicking on it, a "bubble" with a brief description of the device deployment will be shown.

Clicking the chart opens summary information with the results of

monitoring at that location. It can be displayed in a new window or be saved to a local drive, whic depends on your settings of the browser. The Transmitters button on the map control panel does not turn on directly the transmitters layer, but opens up another window (Fig. 8).

Only in this window the displaying of different types of transmitters can be shut down or turned on. Bulk turning off and on of displaying

of all the transmitters can be done by using

the checkboxes on the "All transmitters."

Click "Points of measurements" to switch to the map display without the layer of the electric field, while showing the places where the measurements were made. These places are marked with a car icon with an antenna (Fig. 9). The location and time of measurement, as well as preview of graphical processing of measured data will be displayed after clicking on the car icon. Click on the chart icon displays a graph of the measured value of the electric field for a specified location. Visual displaying depends on the settings of your browser. To redisplay the layer of the electric field press the button EMF map.



Fig. 9 - Monitoring station



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Detection of calculated values on the EMF map:

To simplify the search for points of interest and to increase the comfort of examining its surroundings, so called measurement function was implemented, so it is possible to determine the calculated value of the electric field in the selected location. This feature can be turned on or off with the button Measurement placed above the map. After switching the measurement mode the measuring device icon displays on the map (Fig. 10) along with a text box, in which the information about the current position of the measurement icon on the map is given. The text box appears at the top of the map. At the same time the box below the



Fig. 10 – Measure and search mode.

colour legend turns in the specific colour and the value of calculated intensity of EMF corresponding to this position. Information about the interval of calculated electric field in the place where the icon is located, as well as GPS of this place is displayed over the measuring device icon. Changing the current position is done either by moving the icons around the map or directly by writing an address in the text box at the top of the map, which also has a search function. When

writing the address the "whispering" function activates, so it is sufficient to write only a few characters and then choose the right item from the displayed list. When you move the icon, the new place is marked with a cross (Fig. 11).



marked with a cross

Panorama mode:

Using the Panorama button it is possible to switch the default map view in panorama mode (Fig. 12). This mode allows to explore a point of interest in the real place. Also in this mode measurement and search works similarly, as in the standard display, and in addition it is also possible to move the human figure after a small map (on the right in the bottom) for better orientation and faster search of the address. There are certain limitations when you move the human figure around the map, that are set by Google. As Google sees only the places where the street view cars were, some points are not available. This applies to several streets, parks, forests, private buildings, yards, etc. If the view returns to the Panorama mode right on a place like this, iterative algorithm finds the closest street view photo to the desired location and displayes view from this new position. In case when the measuring mode is



Fig. 12 - Panorama mode

enabled, it simultaneously moves the measure icon there. In Panorama mode when measurement is operating, the icon can get outside the field of view. It is then necessary to disable and subsequently enable power measurements, and consequently the icon appears in the visual field. But by turning off and back on to the Panorama mode, the camera reaches the position of the device icon.

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CONCLUSION:

The web page of the project (particularly the map) can be continuously optimized, which may cause minor discrepancies between this manual and the displayed version of the site. The functionality of the page is influenced by used web browser (we recommend using Chrome). In case of malfunction of some page, please try to clear your browsing history and reload the page.