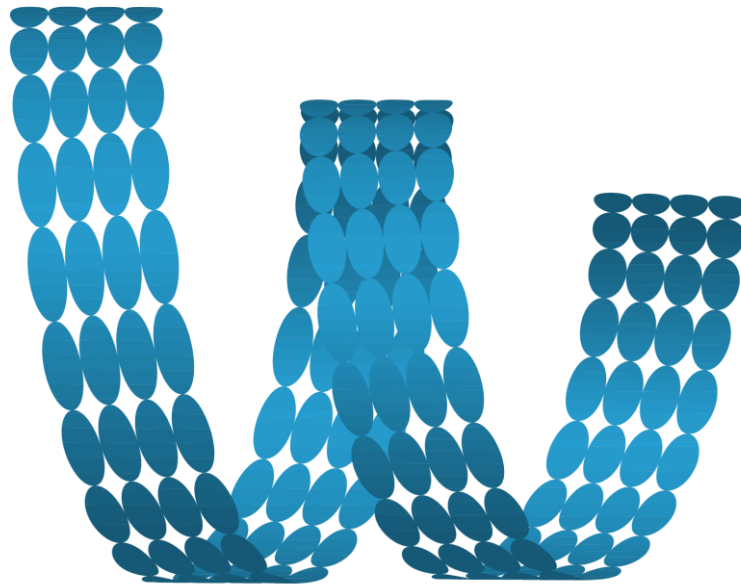


Technische Hochschule Wildau

Telematik



WeatherStation User's Manual

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1. General Information

1.1. System Overview

This WeatherStation program is a software program which displays weather related data measured by Raspberry Pi micro-controllers with the help of MEMS Sensor Boards. Users are able to view real time data from the micro-controllers and historical data from the database.

1.2. Organization of the Manual

This user's manual consists out of three sections: *General Information*, *System Summary* and *Using the program*.

The *General Information* section explains the purpose of the program in short terms.

The *System Summary* section provides a general overview of the program. The system configuration is explained, which includes hardware and software requirements. User access levels are also included in this section.

The *Using the program* section provides a detailed but simple explanation of the system functions. This section is intended for the user and it helps him to get familiar with the use of the WeatherStation program.

1.3. References

<http://www.arbowebforest.com/android/ArboWebForestUserManual.pdf>

2. System Summary

2.1. System Configuration

The WeatherStation program is a cross-platform application which displays weather related data. To access the program the user is required to have a connection to the Internet.

2.2. User Access Levels

For using this program, the user needs to have a registered account, which he can make on the starting screen (Log in - more in the Using the program section).

There are two users of this program, the general user and an admin user.

The general user can log in into the program with his username and password and has access to all non-administrative functions of the program (viewing real-time data, viewing historical data, adding/editing new Weather stations, adding new recordings, changing the language of the program).

The admin user has access to all the mentioned functions and besides that he has also access to administrative functions (editing/deleting users, changing the interval of measuring for each Weather station, editing/deleting new and existing Weather stations).

3. Using the program

3.1. Starting the program

For starting the WeatherStation program you just need to double-click (or right mouse click - > open) the WeatherStation program icon.

3.2. Registration and Logging in

After starting the program, the first window is the *Log-in window*.



Figure 1 - Log-in window

But to log in into the program, you need to be registered first. To register you can click on the *Register now* button. A new *Registration* window will show.

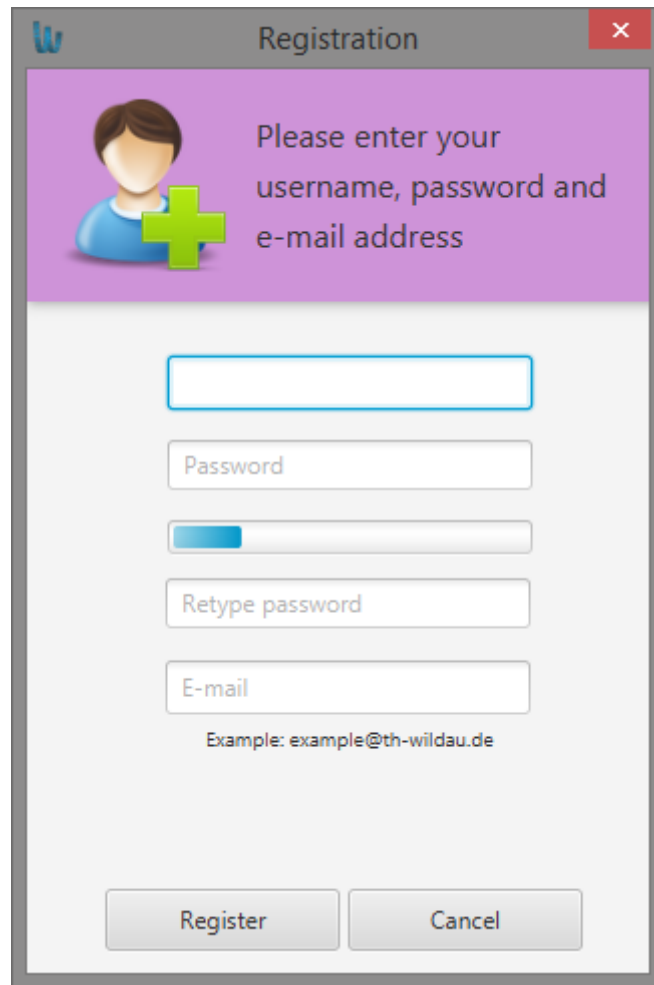
A screenshot of a 'Registration' window. The window has a title bar with a 'w' logo, the text 'Registration', and a close button. The main area has a purple header with a user icon and a green plus sign, and the text 'Please enter your username, password and e-mail address'. Below this are five input fields: a blank field for 'Username', a field for 'Password', a progress bar, a field for 'Retype password', and a field for 'E-mail'. Below the 'E-mail' field is an example: 'Example: example@th-wildau.de'. At the bottom are two buttons: 'Register' and 'Cancel'.

Figure 2 - Registration window

For registering you have to enter your desired username, two times your password and your e-mail address. After all required fields are filled you can click on the *Register* button to register yourself (of course if all fields are correctly filled).

After that, you can log in into the program by entering your username and password into the fields intended for that on the *Log-in* screen (Figure 1).

If you are an administrator, you have to select *Administrator* in the drop-down menu and register with the default admin account.

After logged in, the *Home screen* will appear. If logged in as an administrator a different *Home screen* will appear intended for the administrator (3.3. Home Menu).

3.2.1. Changing your password

If you have forgotten your password, or you just want to change it, there is an option for that on the *Log-in* screen. By clicking the button *Forgot password?* a new window will appear.

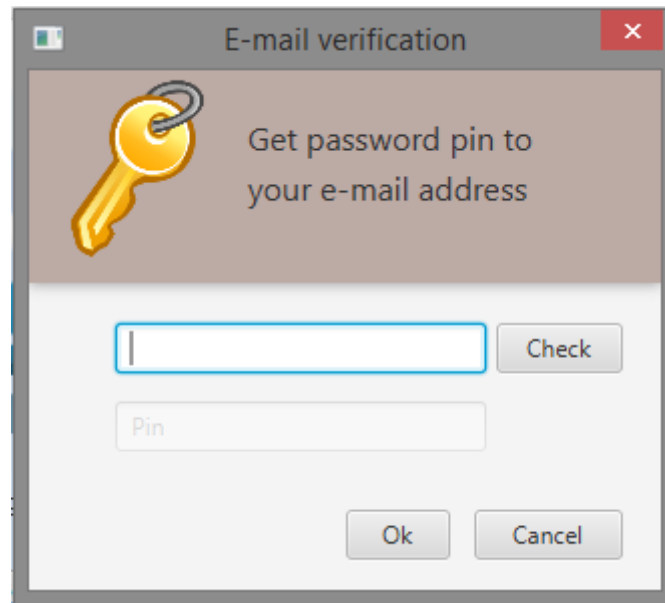


Figure 3 - Forgot password?

On this window you have to enter your e-mail address which you have used for registering. After you click the *Check* button, you will receive a pin for resetting your password by e-mail (if the entered e-mail is valid). This pin you have to enter into the *Pin* input field under the entered e-mail address. After that click the *Ok* button and a new window will show for setting your new password.

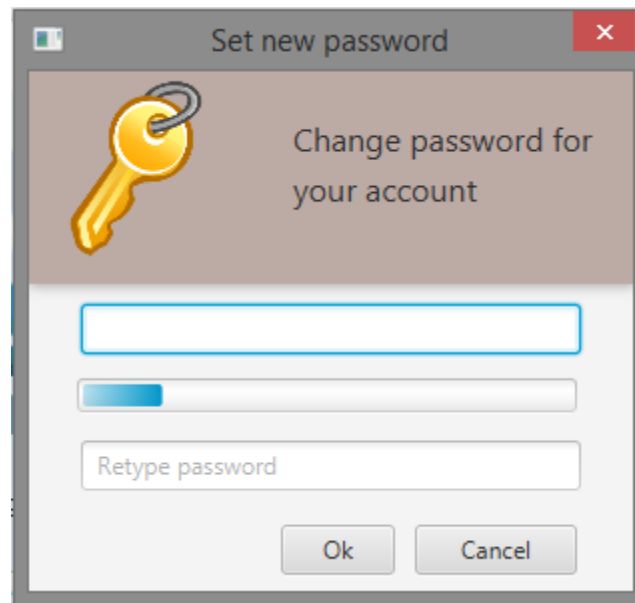


Figure 4 - Setting new password

On this window you just have to enter your new password, and retype it, into the intended fields and click Ok. Now your password is changed.

3.3. Home Menu

After logged in the *Home screen* will show.



Figure 5 - Home screen

The *Home screen* consists out of two main buttons – *Connect* and *Historical*, and two side buttons – *Language* (Globus icon) and *Help* (Book icon). Besides those buttons, there is also an option to log out by clicking the *Options* button in the top left corner of the screen and selecting *Log out*. When you click on the *Log out* option you will return on the *Log-in screen*.

For viewing the current weather data click the *Connect* button (3.4. Main panel (Connect)).

For viewing historical data (in a chosen interval) click the *Historical* button (3.5. Historical).

For changing the language of the program click the *Language* button (3.6. Language).

And by clicking the *Help* button the User's Manual of the WeatherStation program will show.

3.3.1. Home Menu (Administrator)

If you are logged in as an administrator, the *Home screen* intended for the administrator will show.

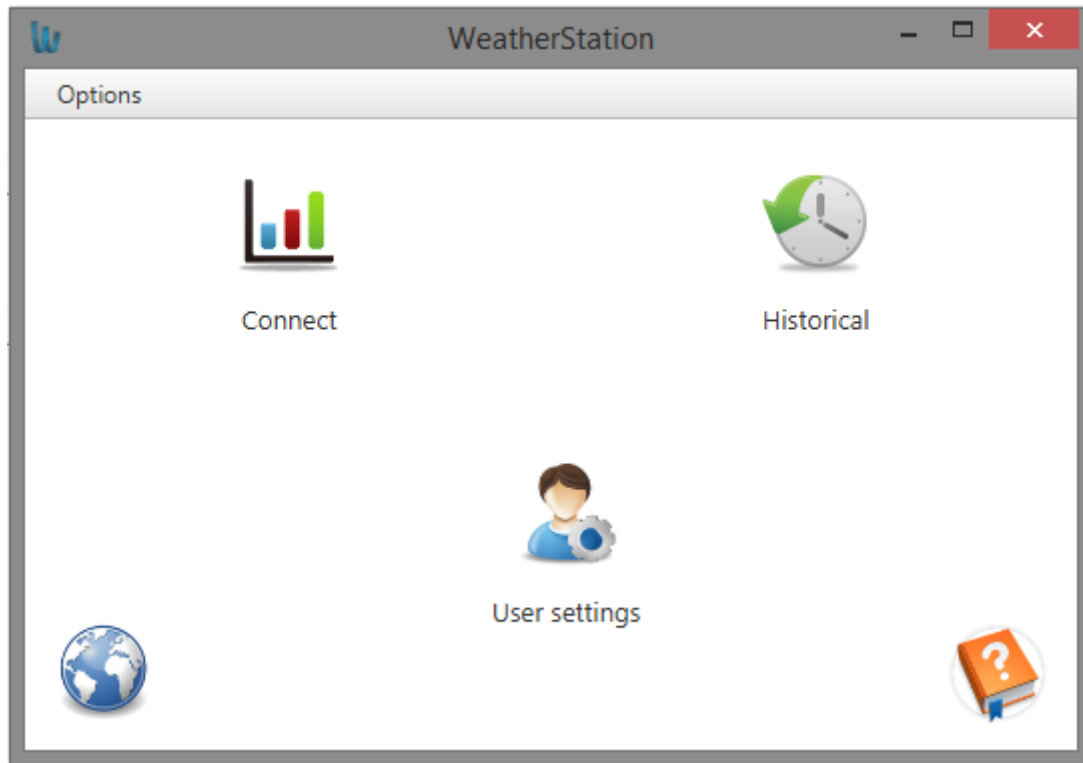


Figure 6 - Home screen (Administrator)

In this menu, besides all the options as in the user's *Home screen*, you have also a *User settings* button where you can edit or delete users (3.7. User settings (Administrator)).

3.4. Main panel (Connect)

By clicking the *Connect* button on the Home screen, the *Main panel* appears.

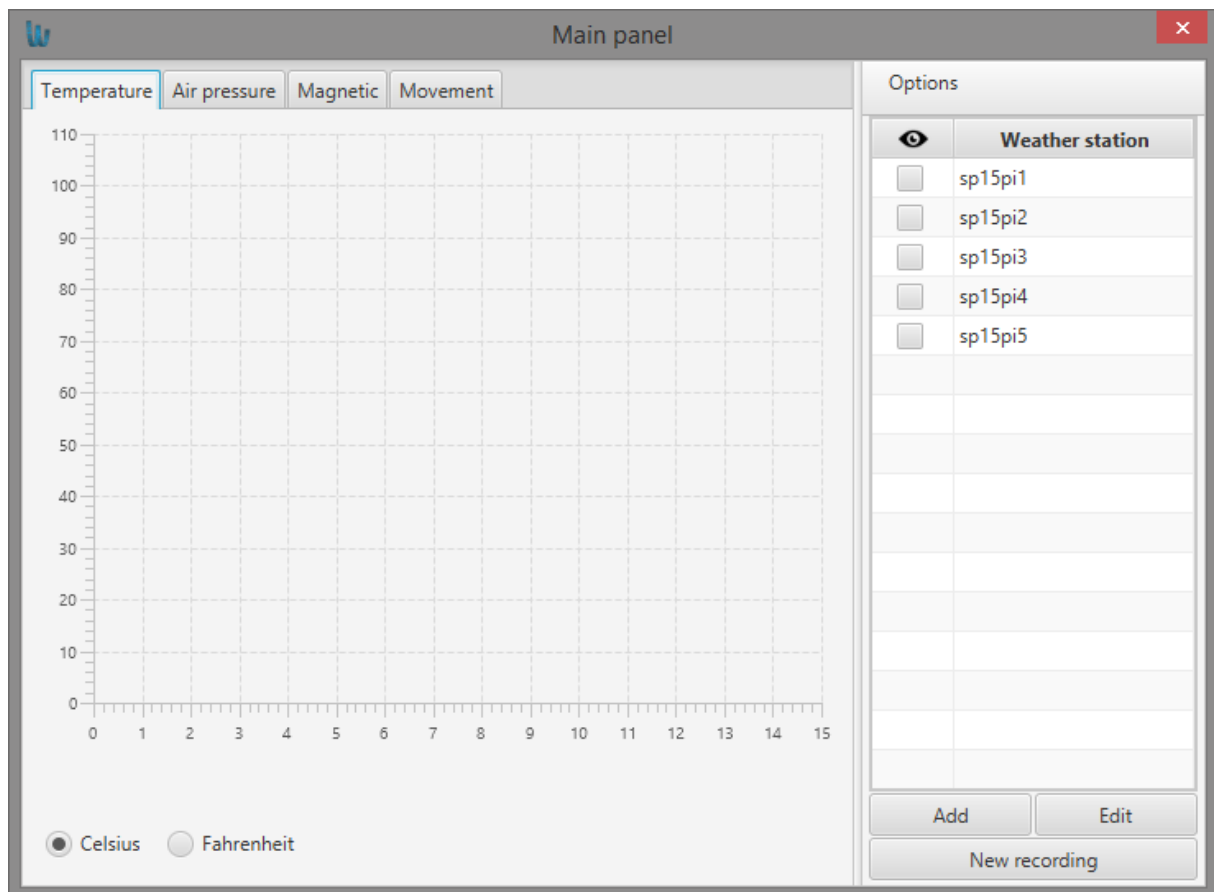
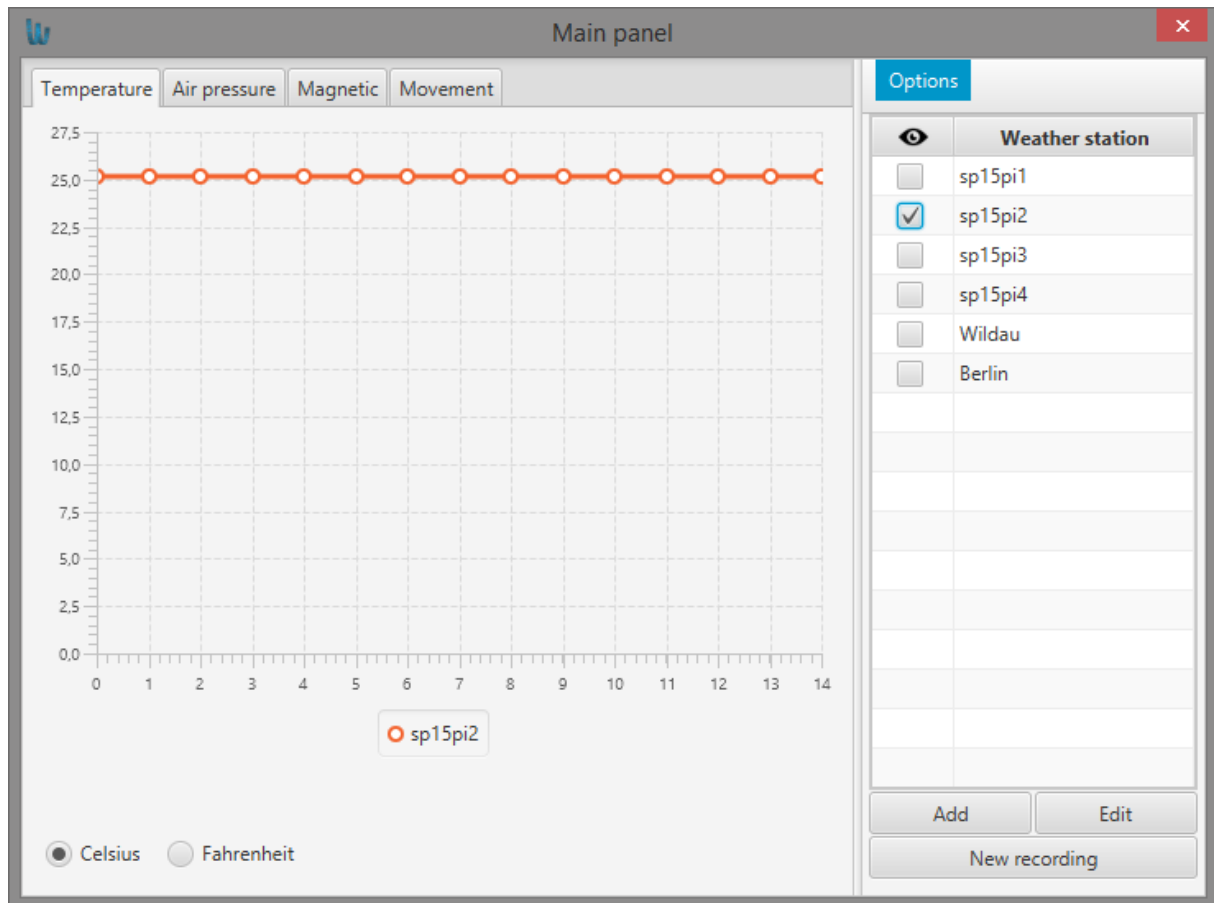


Figure 7 - Main panel window

In this window is the current data from the Weather stations displayed.

You can choose if you want the temperature, air pressure, magnetic or movement to be displayed by clicking on the corresponding tab. By selecting the desired Weather stations on the right side of the window, the data for those will be displayed on the charts.

Besides that, you can also choose in which measurement unit you want the temperature and air pressure data to be displayed (Celsius and Fahrenheit for temperature, Bar and Hectopascal for air pressure).



3.4.1. Adding new Weather Stations

If you want to add a new Weather station, you can click the *Add* button in the bottom right corner of the *Main panel*. A new window appears where you can enter the required information about the new Weather station (Example – Figure 9).

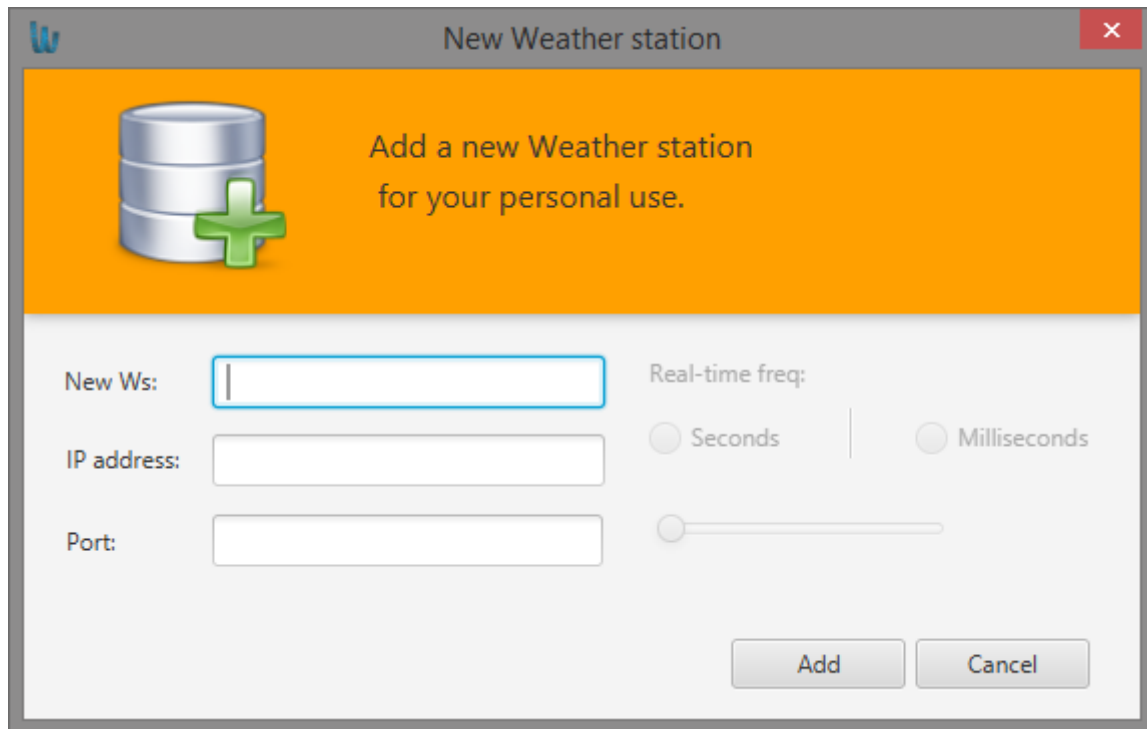



Figure 9 - Adding a new Weather station





3.4.2. Editing Weather Stations

If you want to edit existing Weather stations, you can click the *Edit* button in the bottom right corner of the *Main panel*. A new window appears where you can see a list of the existing Weather stations.

Note that if you are not an administrative user, you cannot neither edit/delete the five Weather stations included with the WeatherStation program, nor you can set the real-time frequency for the Weather stations. But if you have added a Weather station, then you can edit it by selecting it from the list, changing the information under the list and click *Save changes*, or delete it by clicking the *trash can* icon in the *Delete* column.



Edit existing or delete selected Weather station.

Name	IP address:	Port	Delete
Pi5	194.95.45.50	32930	
Finalmente	194.95.45.50	42689	
sp15pi22	194.95.45.246	39534	
newWs	194.95.45.200	80	

Ws name:

IP address:

Port:

Real-time freq:

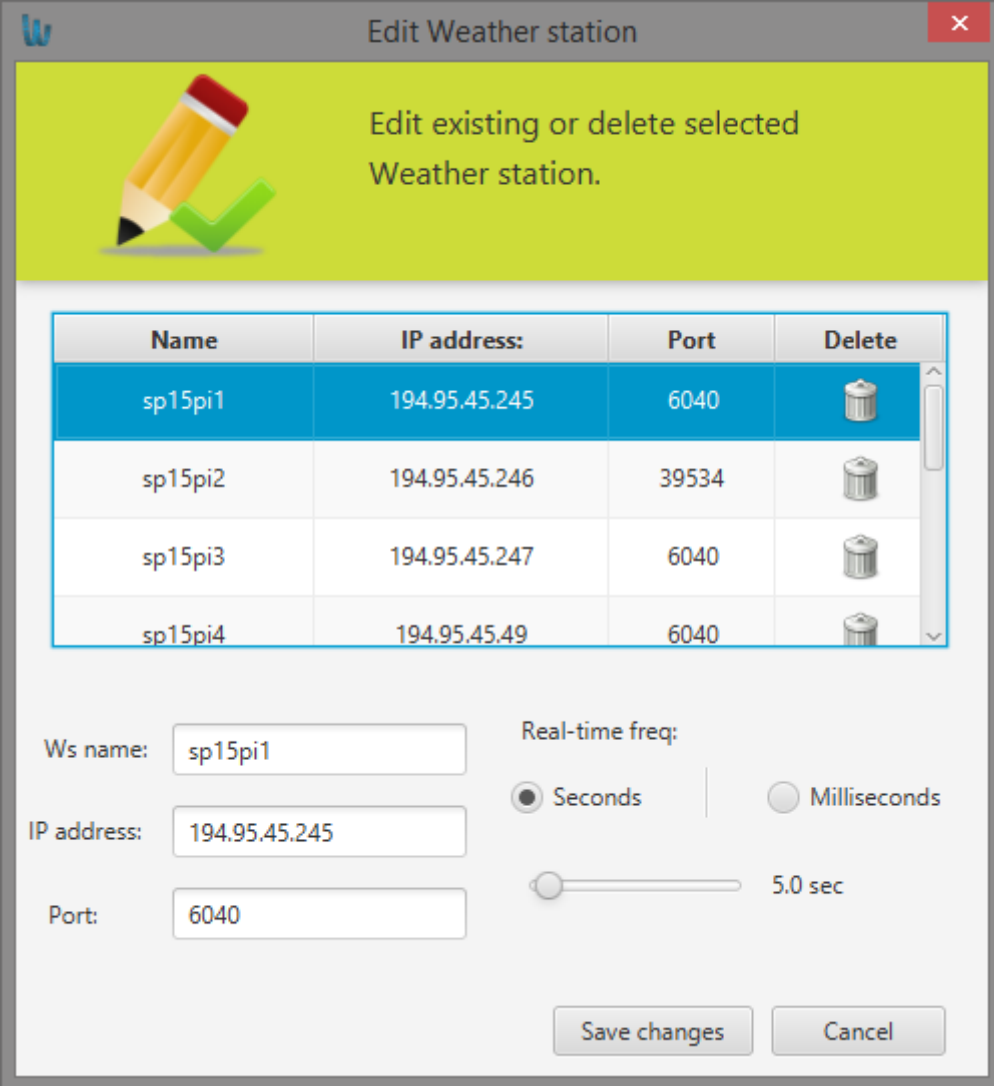
☐ Seconds

☐ Milliseconds

Save changes

Cancel

Figure 10 - Editing Weather stations

The image shows a software window titled "Edit Weather station" with a close button in the top right corner. The window has a yellow header bar with a pencil icon and the text "Edit existing or delete selected Weather station." Below the header is a table with four columns: "Name", "IP address:", "Port", and "Delete". The table contains four rows of weather station data. Below the table are input fields for "Ws name:", "IP address:", and "Port:", each with a text box containing the value "sp15pi1", "194.95.45.245", and "6040" respectively. To the right of these fields is a "Real-time freq:" section with two radio buttons, "Seconds" (selected) and "Milliseconds", and a slider set to "5.0 sec". At the bottom right are "Save changes" and "Cancel" buttons.

Name	IP address:	Port	Delete
sp15pi1	194.95.45.245	6040	
sp15pi2	194.95.45.246	39534	
sp15pi3	194.95.45.247	6040	
sp15pi4	194.95.45.49	6040	

Ws name:

IP address:

Port:

Real-time freq:
☒ Seconds ☐ Milliseconds

5.0 sec

Figure 11 - Editing Weather stations as an Admin

3.4.3. Adding new recordings

If you want to add a new recording, you can click the *New recording* button in the bottom right corner of the *Main panel*. A new window appears where you can set new recordings.

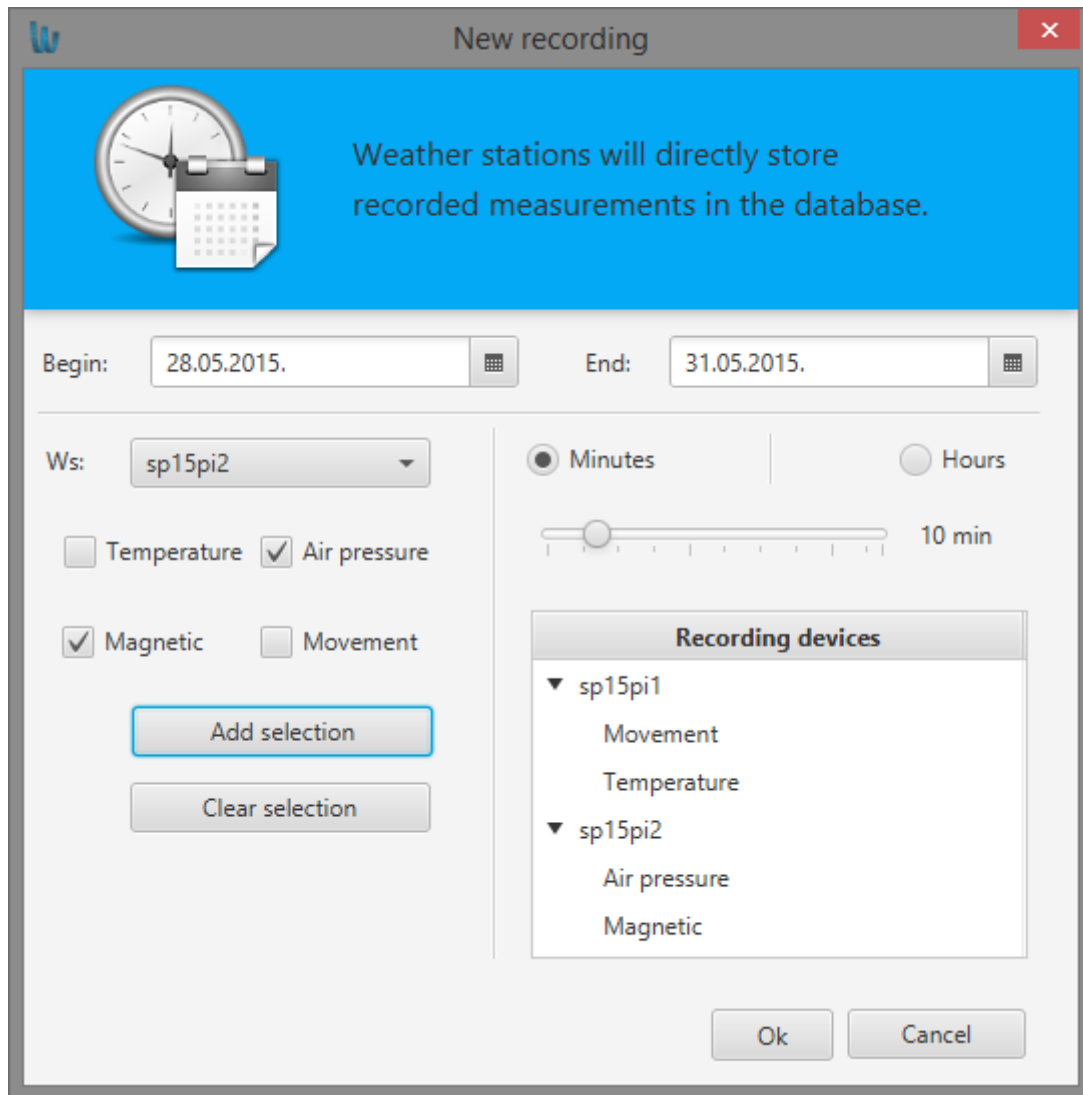


Figure 12 - Setting a new recording

On the image above you can see an example of how to set a new recording. You have to select the desired period in which you want the data to be recorded, select the Weather stations and the sensors which you want to record data and add them to the selection, select the interval in which those data will be recorded (in minutes or hours) and click Ok. And of course you have the option to clear the selection if you have made a mistake or for whichever reason you need to clear it.

3.5. Historical

By clicking the *Historical* button on the *Home screen*, the *Historical window* appears.

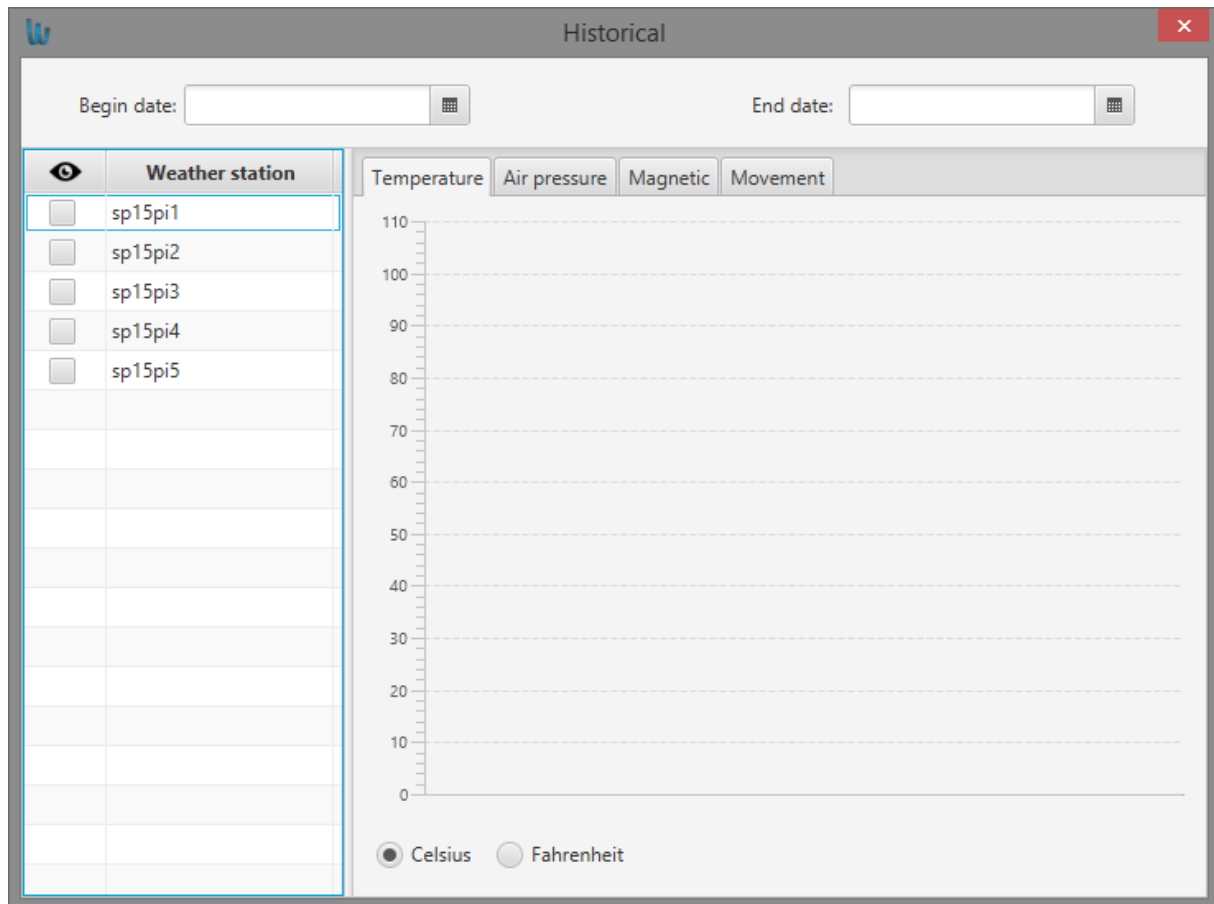


Figure 13 - Historical window

Note that for displaying historical/recorded data from the database, you need to have saved recordings made in the Main panel.

For displaying data in a desired period, first you need to enter the begin and end date of the wanted period (Figure 14).

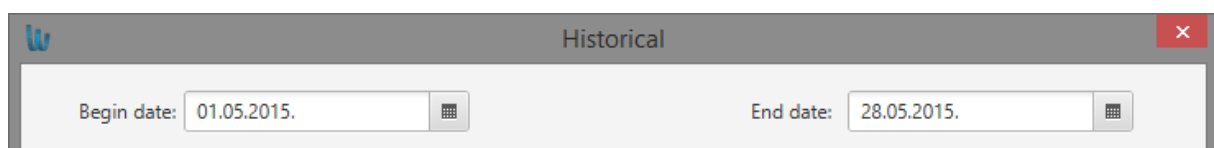


Figure 14 - Begin and End date in Historical

After you have entered the dates, you can choose from which devices (Weather stations) you want to display data (only one Weather station can be displayed on a chart). If a selected device has no data saved in the selected period, a message will show and no data will be displayed. If the selected device has data in this period, it will be shown as a line chart (Figure 15).

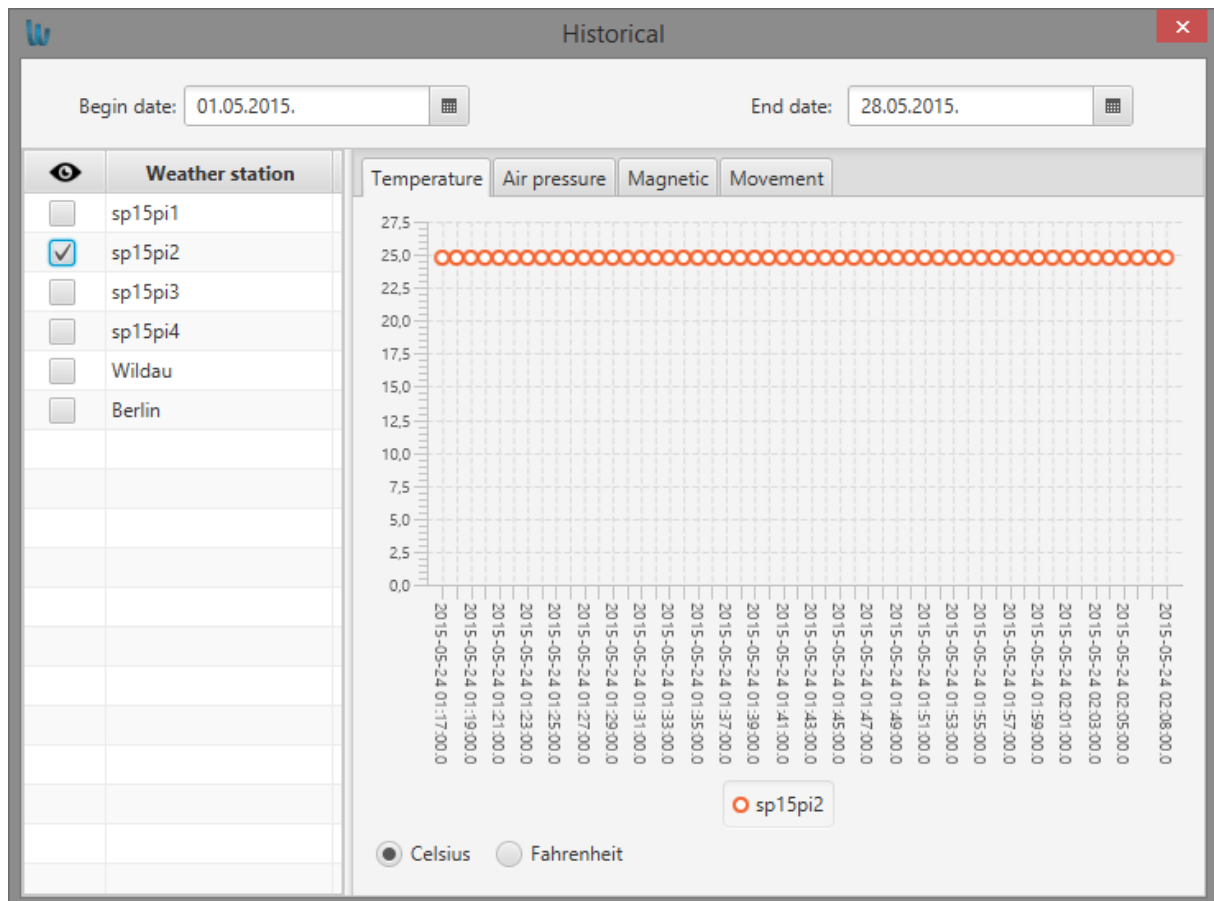


Figure 15 - Display of data in Historical

You have the option at the bottom of the window to change the measurement unit in either Celsius (default) or Fahrenheit in the *Temperature* tab and either Bar or Hectopascal in the *Movement* tab. Data in the Magnetic tab is displayed in Tesla and data in the Movement tab is the orientation of the device graphically displayed.

In the case above, the temperature data in the Temperature tab is displayed. For switching between tabs you just have to click on the desired tab.

In the *Temperature tab* you can view recorded temperature data, in the *Air pressure tab* you can view recorded air pressure data, in the *Magnetic tab* you can view recorded data about the magnetic field and in the *Movement tab* you can view recorded movements of the devices.

For exiting the *Historical window* and returning to the *Home screen* you can click the *x* icon in the top right corner of the window.

3.6. Language

By clicking the *Language* button on the *Home screen*, the *Language window* appears.

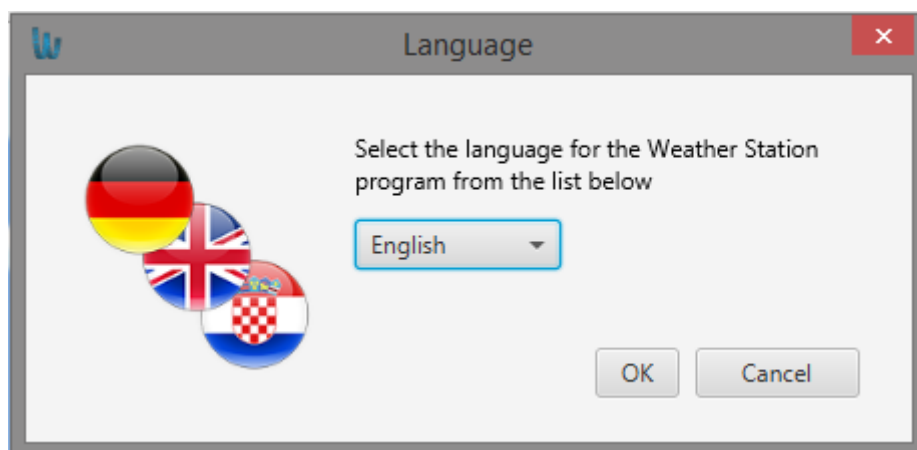


Figure 16 - Language window

Here you can change the language of the program by choosing one of the languages in the drop-down menu. You can choose between English, German and Croatian.

Please note that after starting the program (Log in window), the program will use the language of your operating system if it is one of the three mentioned above, if your default system language is not one of the those, then the program will start in German.

3.7. User settings (Administrator)

By clicking the *User setting* button on the administrator's *Home screen*, the *User settings window* will appear.

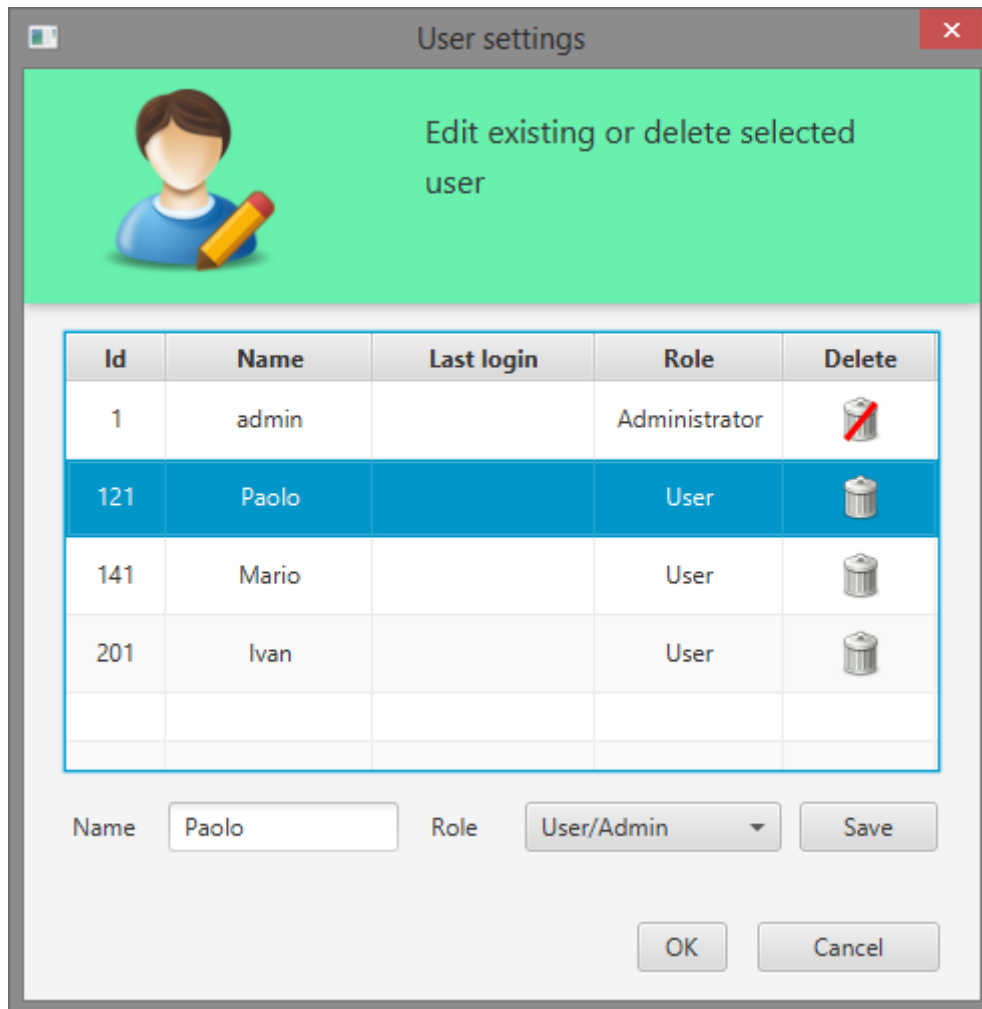


Figure 17 - User setting (Administrator)

Here you can edit or delete users.

For editing a user you need to click on one, the name and the role of the clicked user will be shown in the two fields under the table, then you can either change his name or his role (User or Administrator) and by clicking *Save*, the changes will be saved.

For deleting a user you just need to click on the bucket icon in the *Delete column* and confirming this action (note that you cannot delete the administrators).

3.8. Exiting the program

To exit the WeatherStation program you can always click on the *x* icon in the top right corner of the *Home* and *Log-in screen*.

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