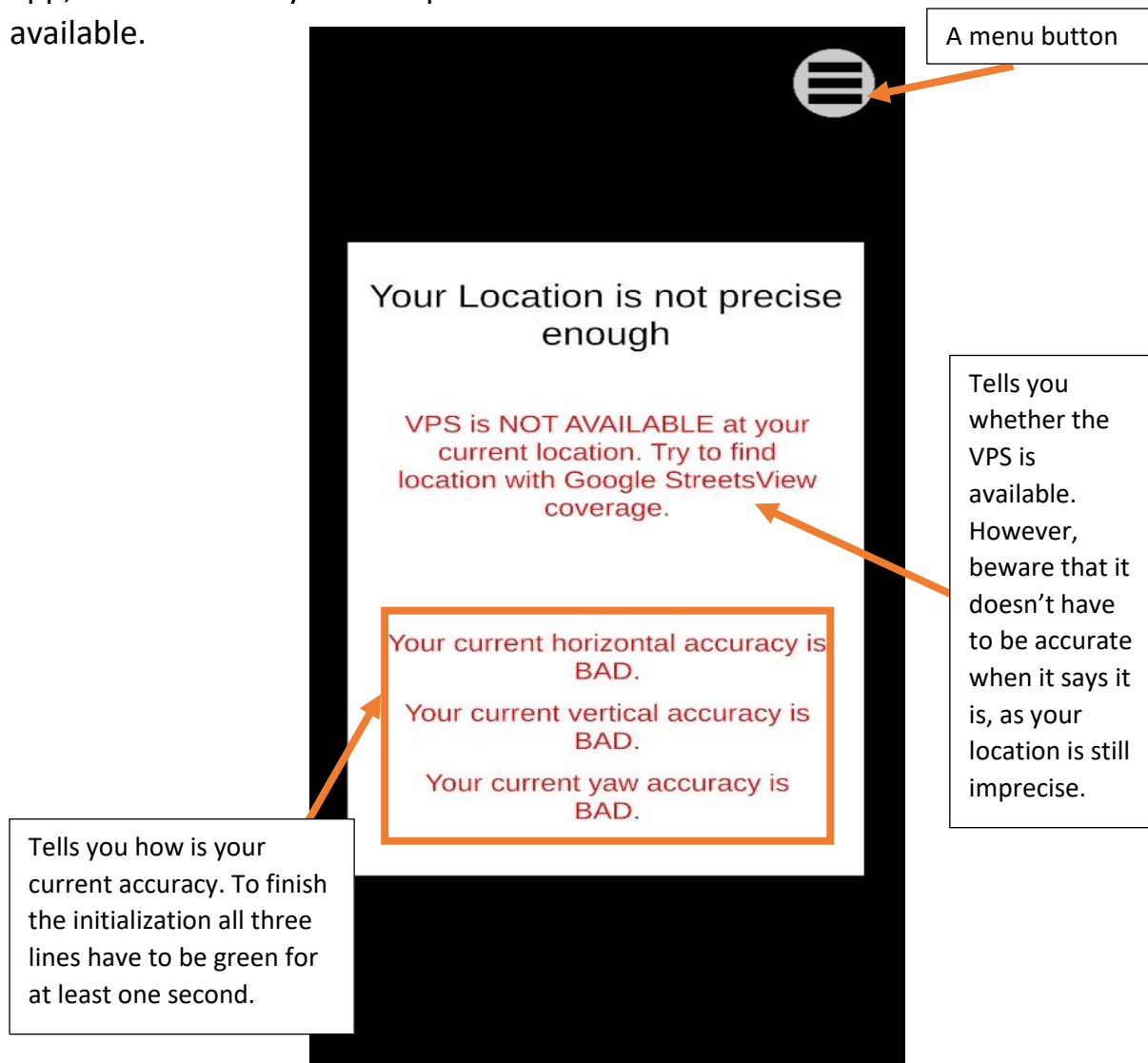


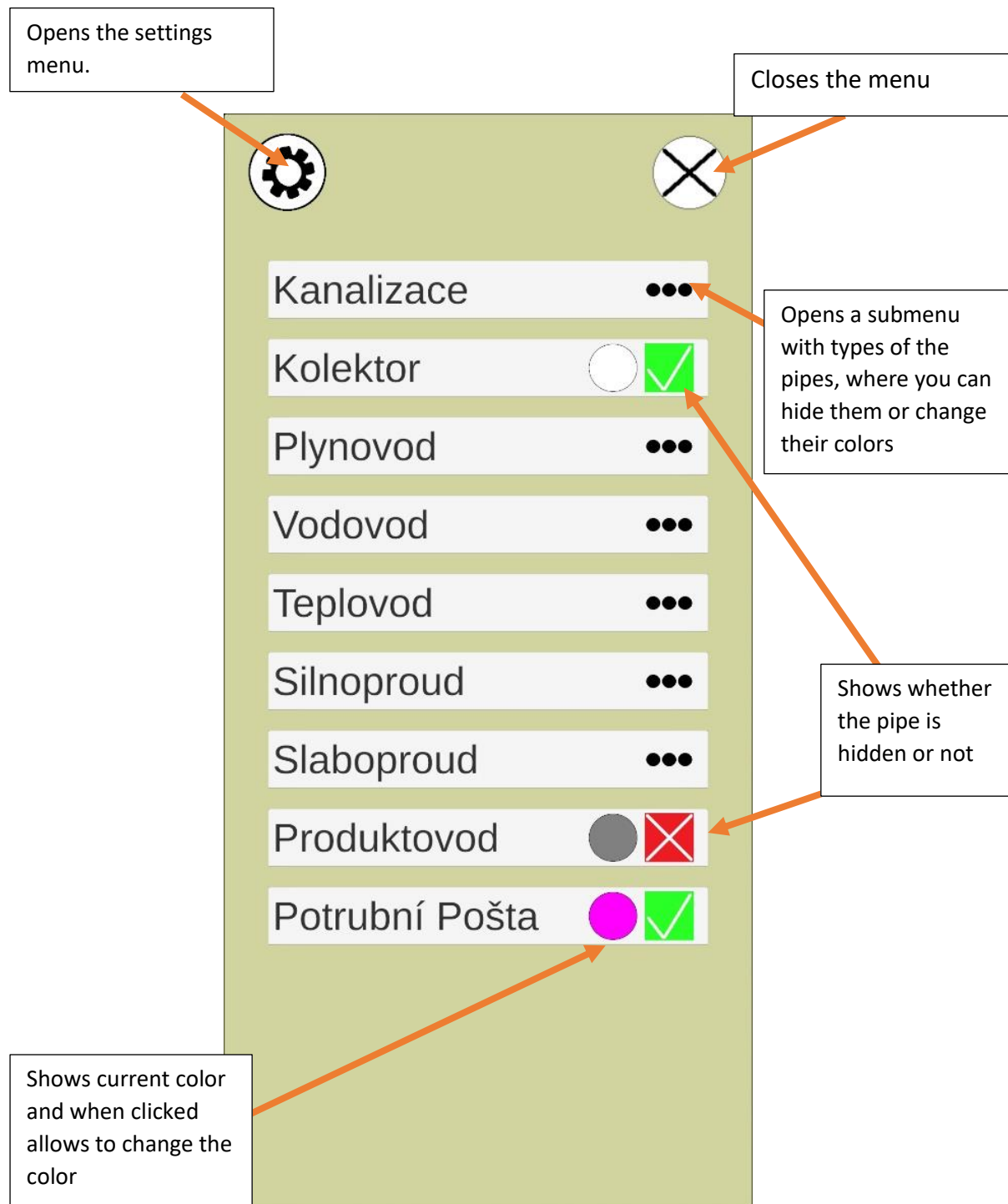
# PipeIT Manual

When you open the app, you are asked to let the application use your camera and get access to your location. The application needs these permissions to run. PipeIT is an AR application; an AR doesn't work without a camera. PipeIT is also a location-based application; without your location, it won't work. Furthermore, it should be noted that this app requires an internet connection and consumes data during its runtime as it downloads data about the pipes and communicates with the VSP server.

Here is a walkthrough of the app where the functionalities are explained. This is the calibration screen. It tells you what your current position accuracy is. To start the AR experience, you must get all three accuracies to green. If you believe that the VPS should be available and it says it isn't, try to restart the app, as sometimes your GPS position is so off that it thinks the VPS isn't available.



Let's take a look at the menu first. When the menu button is clicked, the following screen opens. You can access the settings and change the color of the pipes or hide them.



Now to the settings menu, where you can adjust your app's settings.

The image shows a settings menu for an application, with various options and sliders. Orange arrows point from descriptive text boxes to specific UI elements. The settings menu has a light green background. At the top right is a close button (a circle with an 'X'). Below it are three dropdown menus: 'Occlusion' (set to 'Fast'), 'Lighting' (set to 'Disabled'), and 'Pipes size (meters)' (set to '0.035'). Below these are three sliders: 'Spawn altitude offset' (set to '1.300'), 'Altitude change threshold' (set to '0.300'), and 'Pipes size (meters)' (set to '0.035'). At the bottom are two buttons: 'Reset Colors' and 'Reset Switches'.

Sets the Light estimation mode:

Disabled – There is no estimation, the lightning is not updated and stays on default set values.

AmbientIntensity – This mode tracks the brightness of the outer world and tries to immate it in the virtual world so that it is lighted in the same way.

Sets the occlusion mode. There are three modes:

- Fastest – worse but quick results
- Medium – alright results in alright time
- Best – good result, but can take some time

Closes the settings and save the values

Sets the radius of the pipes

This sets the distance from your phone (altitude wise) in which the pipes are generated. Try to set it so that its approximately the distance of your phone form the ground.

Altitude change threshold

The altitude is the most inaccurate value and it often changes. This can lead to making the pipes fly away or get way too close. So to prevent that, there is this setting. It keeps track of your altitude and if it changes by more then the threshold, all of the pipes are repositioned to keep being spawn altitude offset far away from you. Generally, its better to keep the number low, around 0.3. However, that prevents you from getting too close as moving your phone closer to the pipes would change your altitude and thus refresh them. So in case you want to get to the pipes closer set this value higher, but keep in mind it might result in strange pipe movements.

Reset Colors

Reset Switches

This resets all of the colors to the base setting.

This resets all the switches and thus make all pipes show up again.

Now let's see what happens when you are done with your calibration.

When you finish the calibration, the app starts processing your current position. It prepares the data about the pipes going around you. The amount of time this takes depends on the number of pipes and your internet connection speed. When the data are ready, the pipes will appear.

Keeps track of your position accuracy. As long as it stays blue/green you are alright. Blue is better than green.

You'll see this button if your device supports occlusion culling. And by pressing it you change it on and off.

Beware that when the occlusion culling is on, your viewing distance lowers from 20 meters to 8 meters as that its current limit.

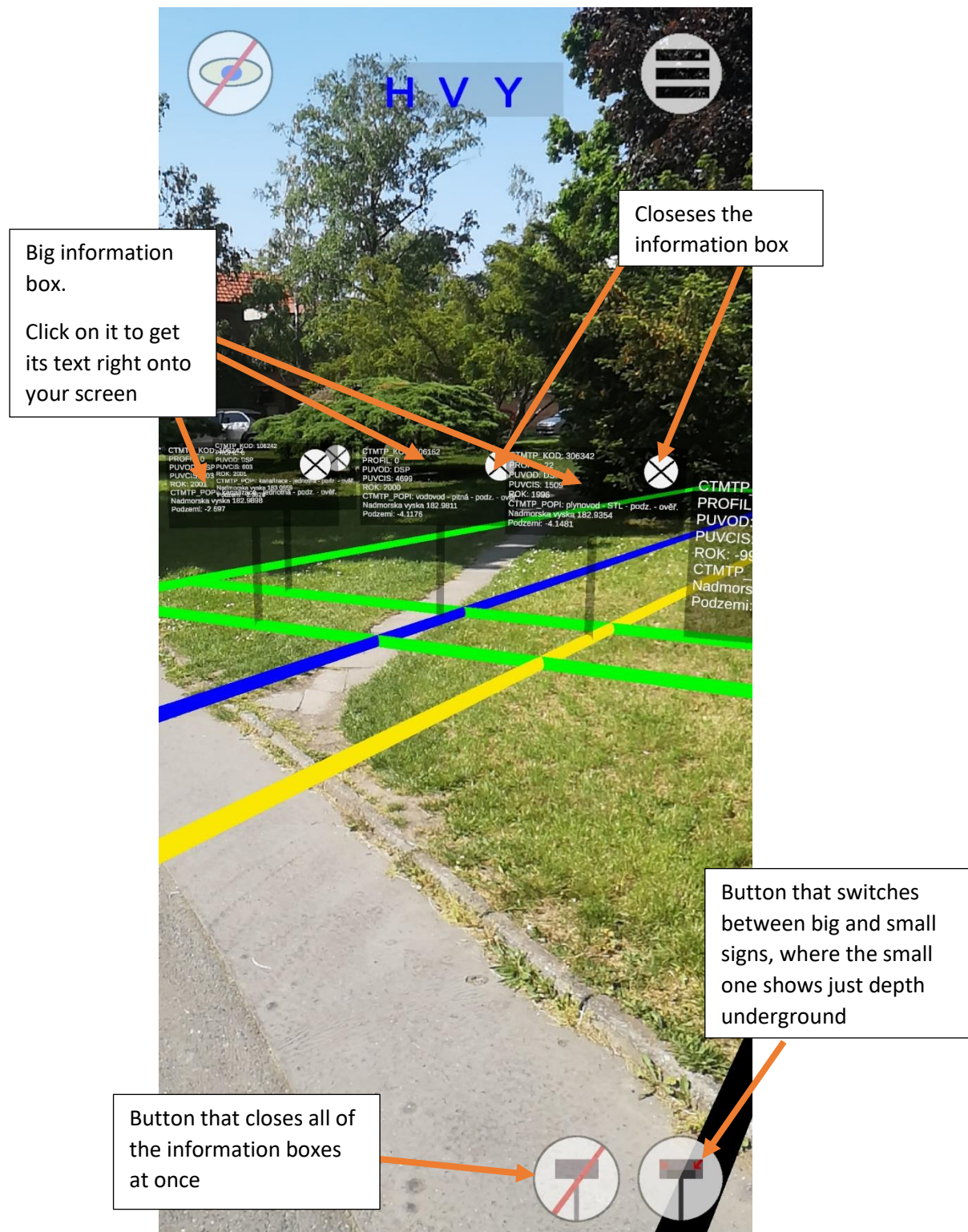


These are the pipes. That's why you are using this app. If you want to get more details about the pipe click on it.



Let's see what happens when you click on the pipe.

When you click on the pipe, the information box appears. It gives all the details that were available in the database. On top of that, it tells you what the pipe's altitude is and how deep beneath the ground it is compared to you. You can create as many information boxes as you like.





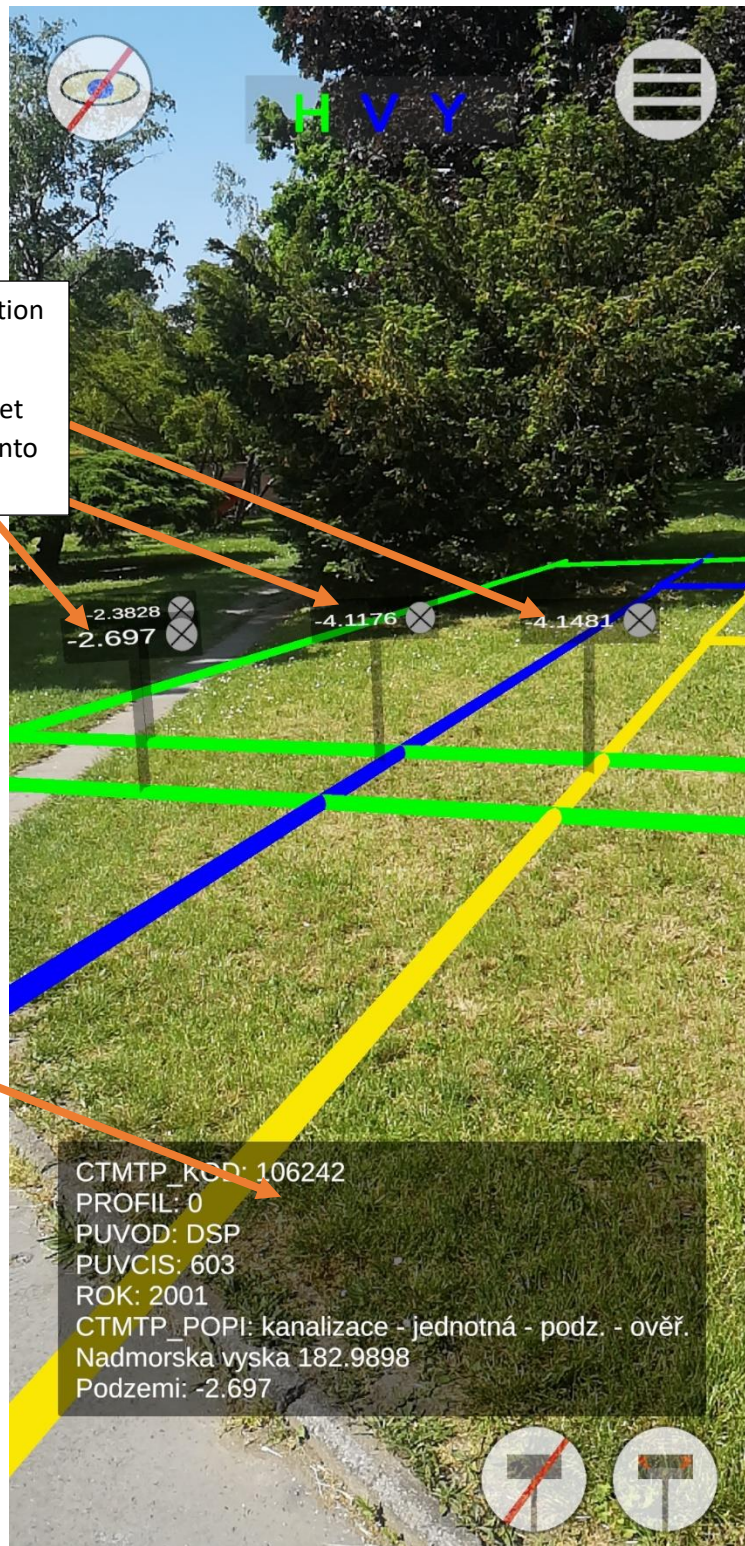
You can always take a step back to read the sign when you are too close, but what if the pipe is too far from you and the information box becomes unreadable. In that case, CLICK on the sign. When you click on the sign, the information appears on your screen and stays there until you click the information box.

Small information box.

Click on it to get its text right onto your screen

Information panel.

Click on it to close it.



Finally, let's discuss what happens when your position accuracy gets too low. A warning message will appear when one of the three values gets from the green zone to the yellow zone. The application will keep showing you the pipes it has already loaded. However, it will not download more data or generate new pipes until you improve your accuracy.



And that's it. This should cover everything there is to this app. Good luck with your pipe hunting!