

3Dimension User Manual

Welcome to the 3Dimension user manual. This guide will help you get started with the 3Dimension Android application, which is designed for real-time 3D ground scanning to locate ferrous metals and precious items using magnetic sensor readings. The application visualizes data, interprets it, and categorizes objects based on the colors generated in the 3D scan. Additionally, it can calculate the depth of detected objects based on the ground type input.

****Table of Contents****

1. ****Introduction****
2. ****Hardware Requirements****
3. ****Setting Up the Application****
4. ****Ground Scan****
5. ****Live Scan****
5. ****Conclusion****

1- Introduction :

3Dimension is an Android application designed for real-time 3D ground scanning, primarily for locating ferrous metals and precious items. It accomplishes this by utilizing magnetic readings from a magnetic sensor. The application further visualizes the received data and interprets and categorizes objects based on the colors generated in the 3D scan. Additionally, the application offers the capability to automatically calculate the depth of detected objects based on the user's input regarding the ground type (e.g., sandy, clay, rocky, coal, light mineral, dense mineral).

The application offers two scanning modes:

- 3D Ground scanning
- Live scanning

Users can transfer magnetic data to the application through two methods:

- Bluetooth
- Serial communication (USB)

2- Hardware Requirements: :

Before utilizing the application, you need the following:

- A board that supports data transfer via Bluetooth or serial communication (USB).
- A magnetic sensor to connect to the board and measure magnetic strength.

3- Setting up the application :

Follow these steps to set up the application:

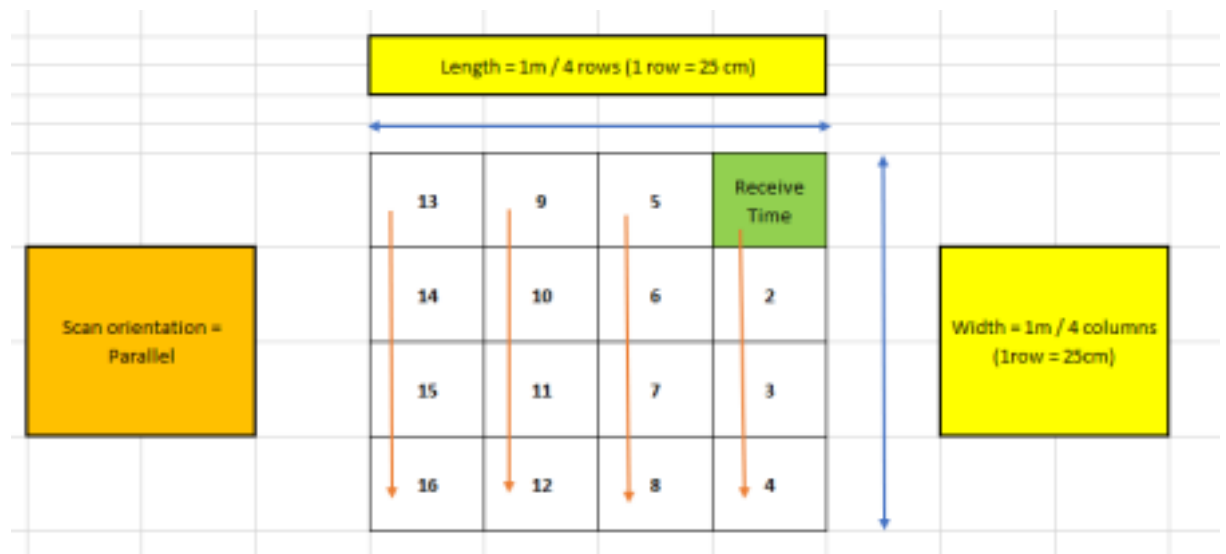
1. Select a communication method from the settings (Bluetooth or USB).
2. Connect your board.
3. If the connection is successful, you will see your board's name in the devices list.
4. Choose your board.
5. A notification will pop up to confirm the successful connection.
6. Finally, once connected, remember to start the program on your board to read magnetic sensor data and send it to the app.

4- Ground Scan :

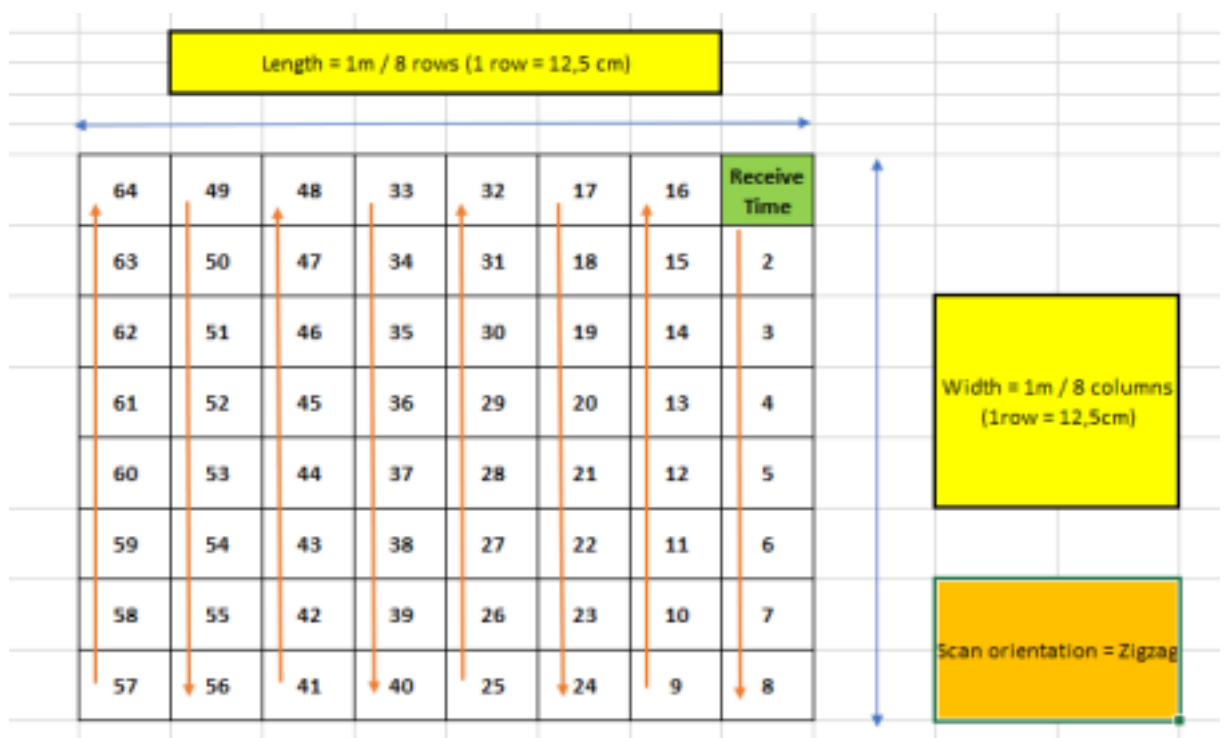
Before initiating a ground scan, it's essential to select the area of ground you intend to scan. It's preferable for the chosen area to be square. For example:

A piece of ground with a 1 m² surface area can be divided into combinations such as (2 rows * 2 columns), (4 rows * 4 columns), (8 rows * 8 columns), (10 rows * 10 columns), and so on. It's recommended to choose a paired and equal combination.

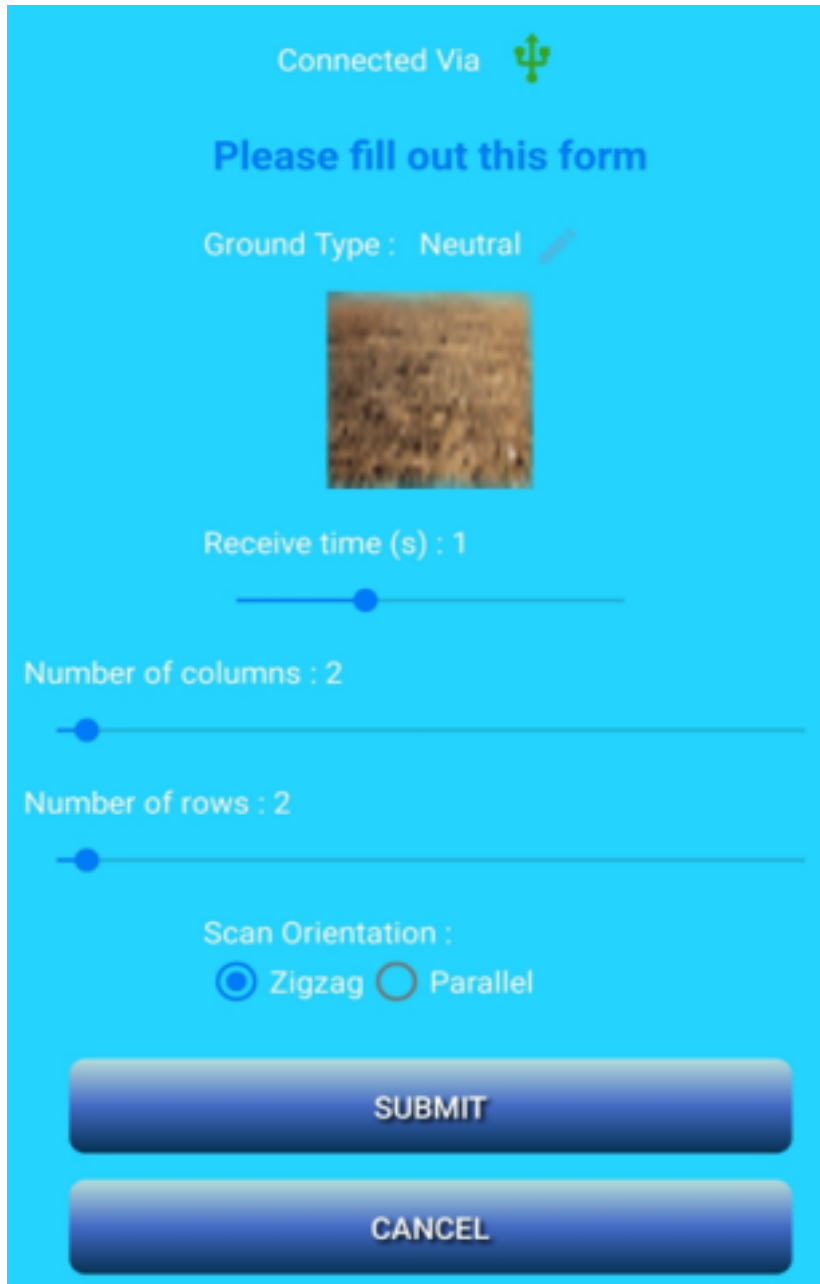
Example 1: Combination (4 rows * 4 columns) (Refer to Graph 1 below):



Example 2: Combination (8 rows * 8 columns) (Refer to Graph 2 below):





Now, let's discuss the settings on the ground scan settings page.



Connected Via 

Please fill out this form

Ground Type : Neutral 



Receive time (s) : 1

Number of columns : 2

Number of rows : 2

Scan Orientation :
☒ Zigzag ☐ Parallel

SUBMIT

CANCEL

- **The ground type :**

You can set the ground type either before or after the scan is completed. It is used to calculate the approximate depth of the detected metal.

- **The receive time :**

This represents the time taken to scan one cell (25cm * 25cm) of ground, as shown in green in the graph above. For example, if you choose 1 second as the receive time, and based on the graph, the scan duration will be 4 rows * 4 columns * 1 second = 16 seconds.

You can select the receive time from 1 second to 3 seconds. Thus, you will need to wait between 1 and 3 seconds before moving to the next cell for scanning.

- **The rows and columns :** Explained in the section above.
- **Scan orientation :**

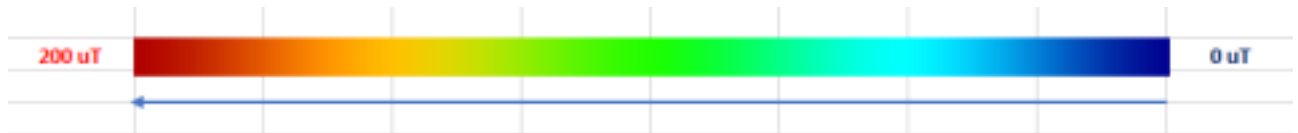
You can choose between two scan orientations:

- **Parallel** (Refer to the direct red arrows in Graph 1): The starting point is the green cell where you stand before initiating the scan. You will follow the numbering pattern as indicated. When switching to another column, the starting point remains the first row.

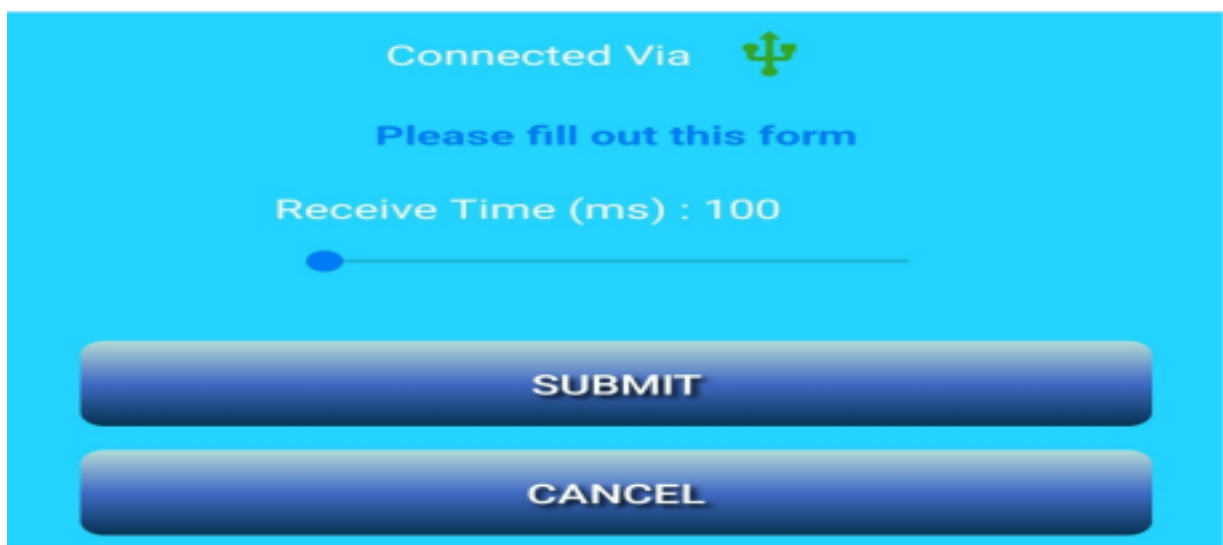
- **Zigzag** (Refer to the direct red arrows in Graph 2): The starting point is also the green cell where you stand before starting the scan. You will follow the numbering pattern as shown. When switching to another column, the starting point lies between the first row and the last row.

5- Live Scan :

The Live Scan function scans the ground and maps it based on colors. You simply press start and move around while scanning the ground. The color will change every time there is a change in magnetic strength. See the photo below for the color mapping based on magnetic strength, with the increasing direction indicated by the arrow below the graph



The live scan settings has only one option which is receive time :



Receive Time (Live Scan):

This represents the time interval between consecutive readings during a Live Scan and can be set between 100 and 600 milliseconds (ms). For instance, if you select a receive time of 100 ms, the application will capture data points every 100 ms as you move and scan the ground. The color mapping will update based on these rapid readings, reflecting changes in magnetic strength.

6- Conclusion :

This instruction manual provides a comprehensive guide to using the **3Dimension** application for both ground scanning modes. Please refer to this manual as you set up and use the application for your scanning needs.