MAGNETISiM

Defining Winding: PCB

GUI Overview

TAB MENU

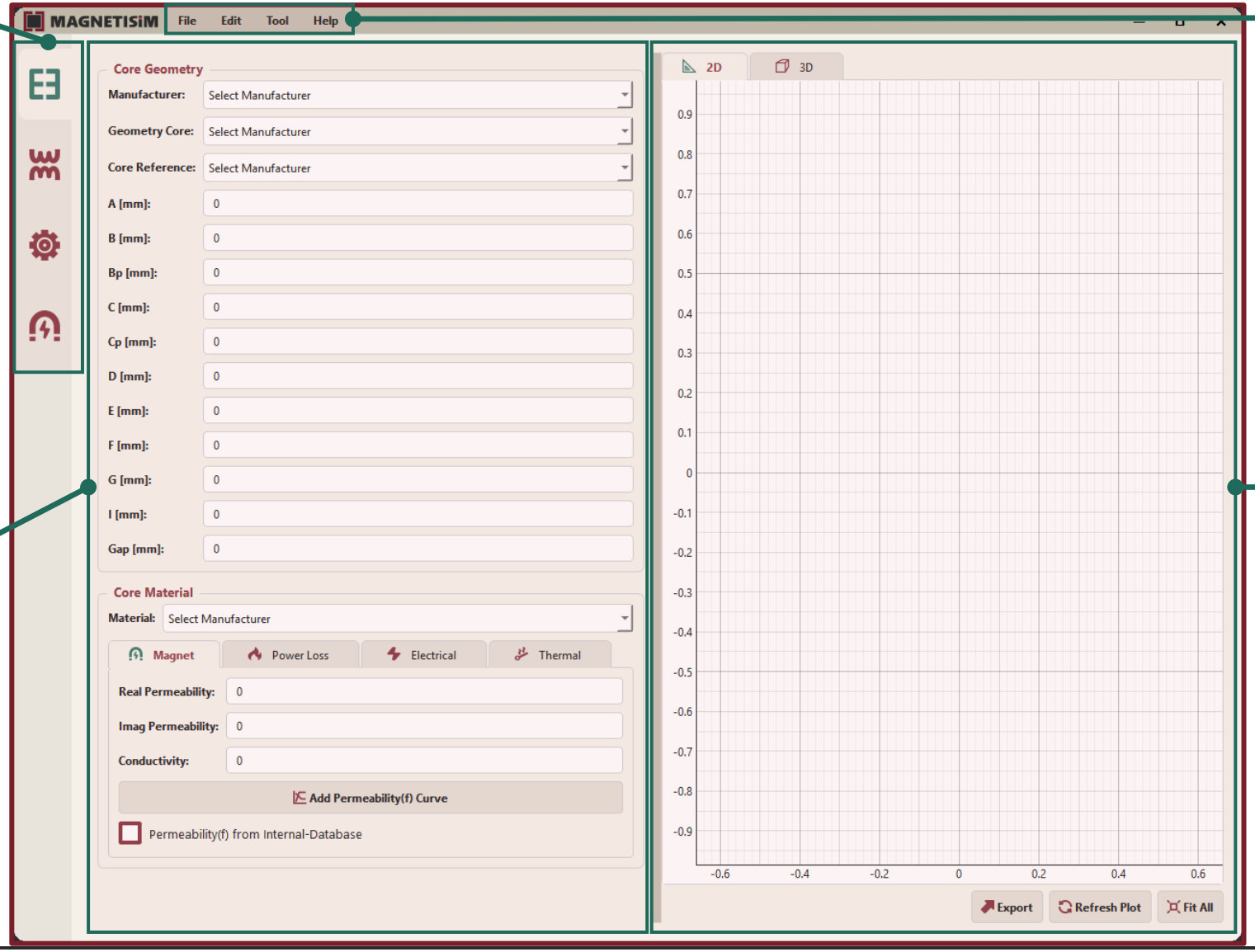
Core Geometry Tab (Ctrl+1)

Winding Geometry Tab (Ctrl+2)

Sim Config Tab (Ctrl+3)

Magnet Tab (Ctrl+4)

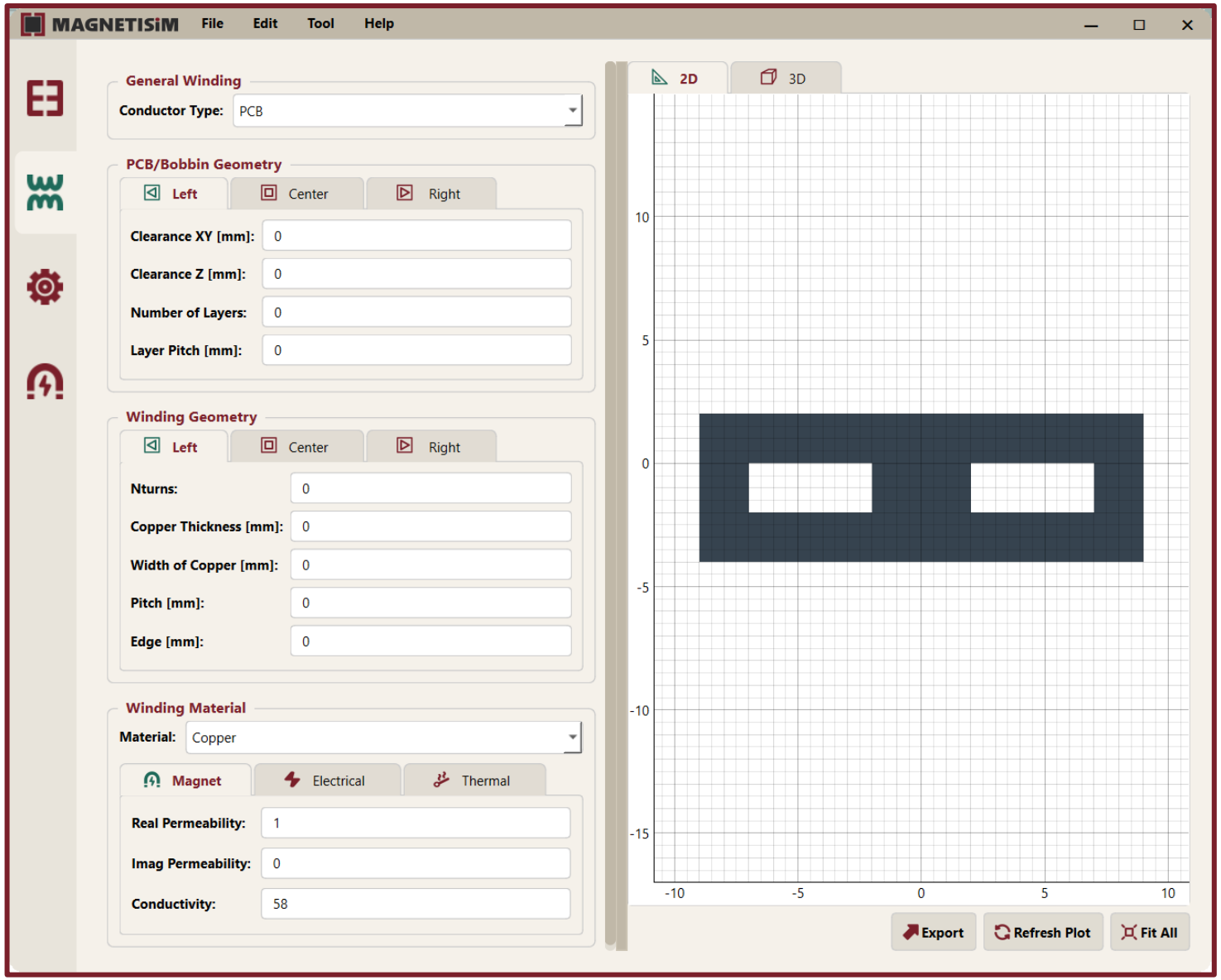
INPUT FRAME



BAR TOOL

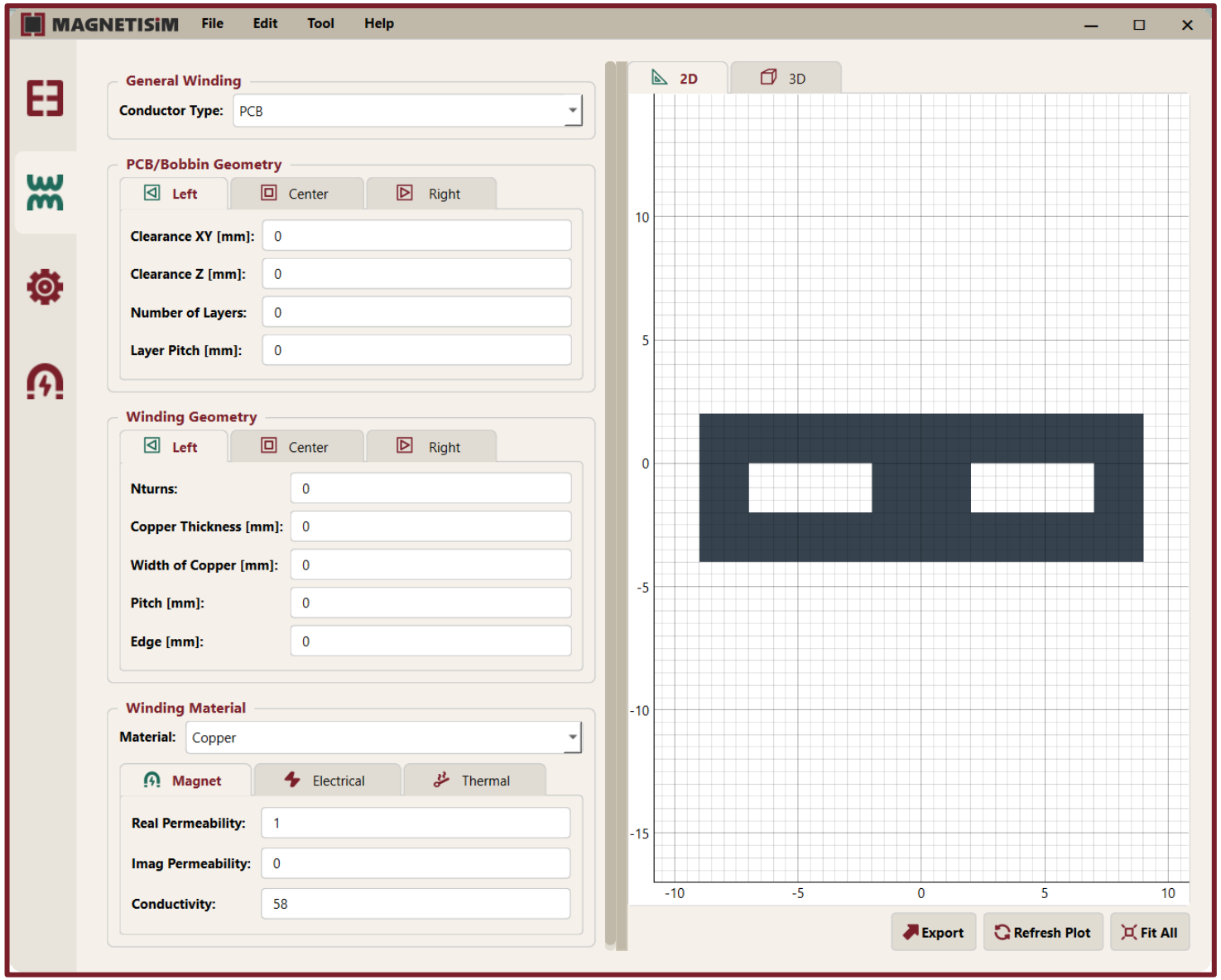
MODELER WINDOW

Winding Geometry Selection – PCB



Before configuring the winding details, make sure your core geometry is properly selected and visualized in the modeler window.

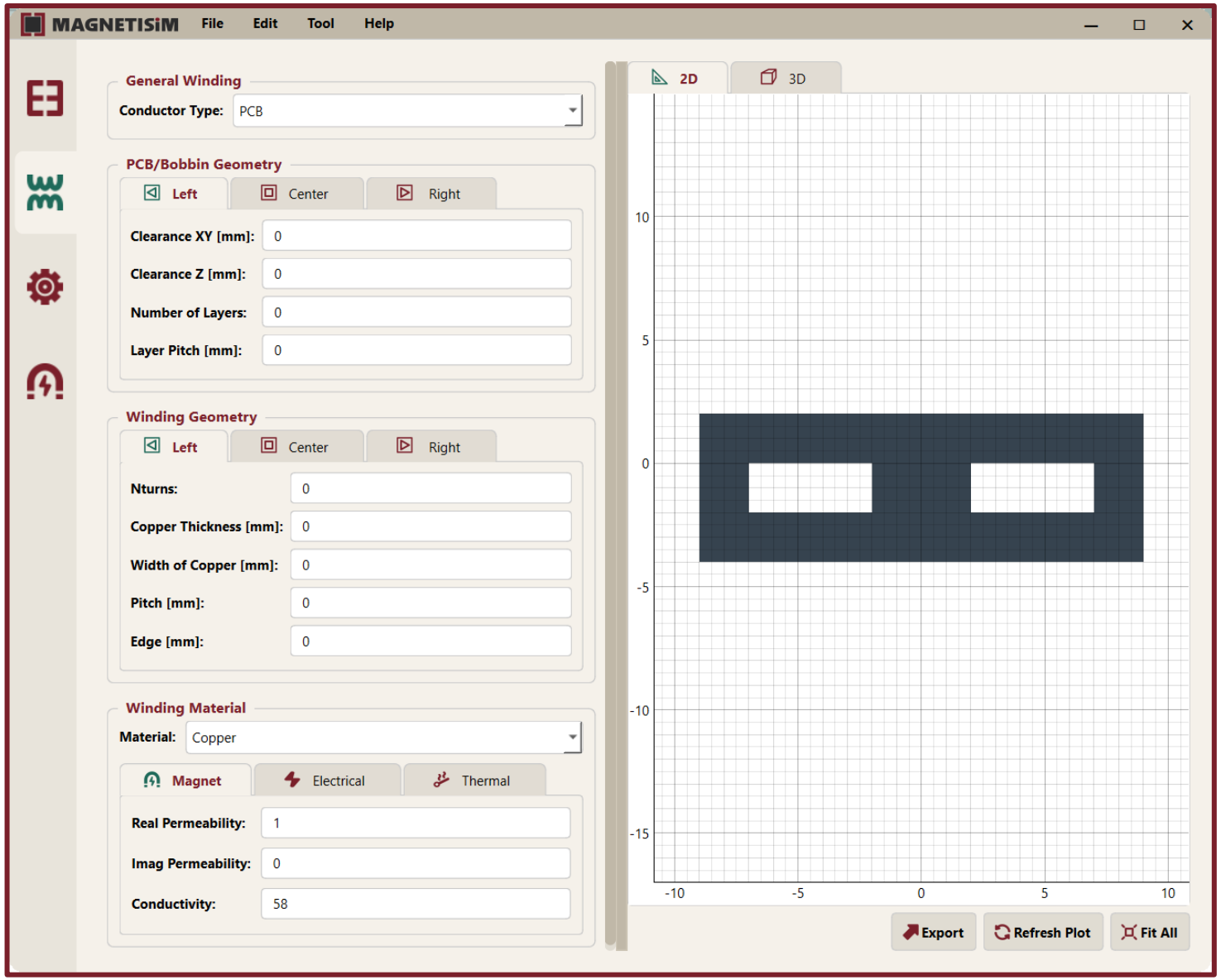
PCB/Bobbin Geometry



Once in the **Winding Geometry tab**, the first step is to configure the overall boundaries of your board in the **PCB/Bobbin Geometry section**.

- **Clearance XY** - This sets the horizontal safety margin or distance between the PCB traces and the core walls.
- **Clearance Z** - This defines the vertical safety distance.
- **Number of Layers** - Here you specify the total number of conductive copper layers your PCB design will have.
- **Layer Pitch** - This dictates the vertical separation between each of those PCB layers.

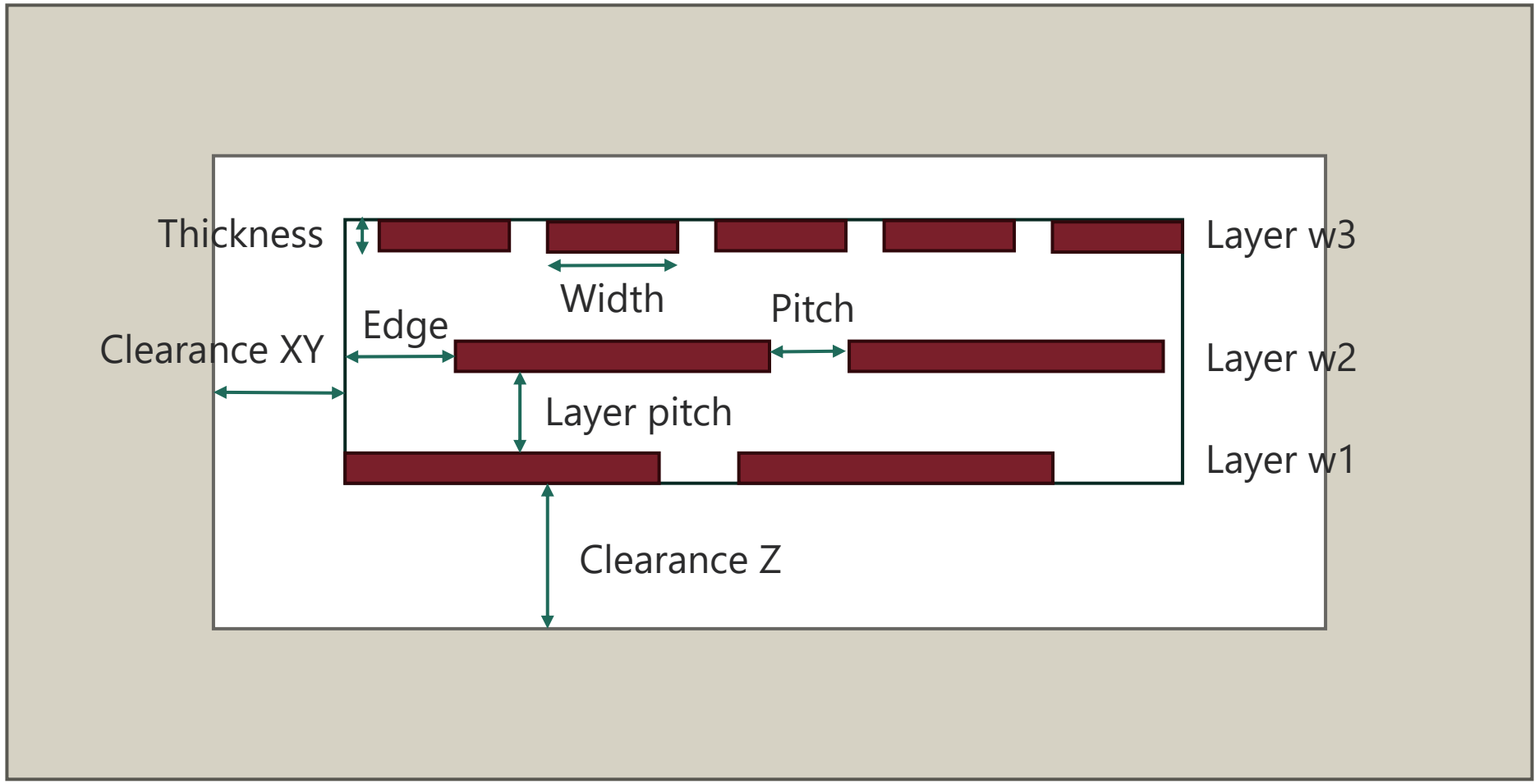
Winding Geometry



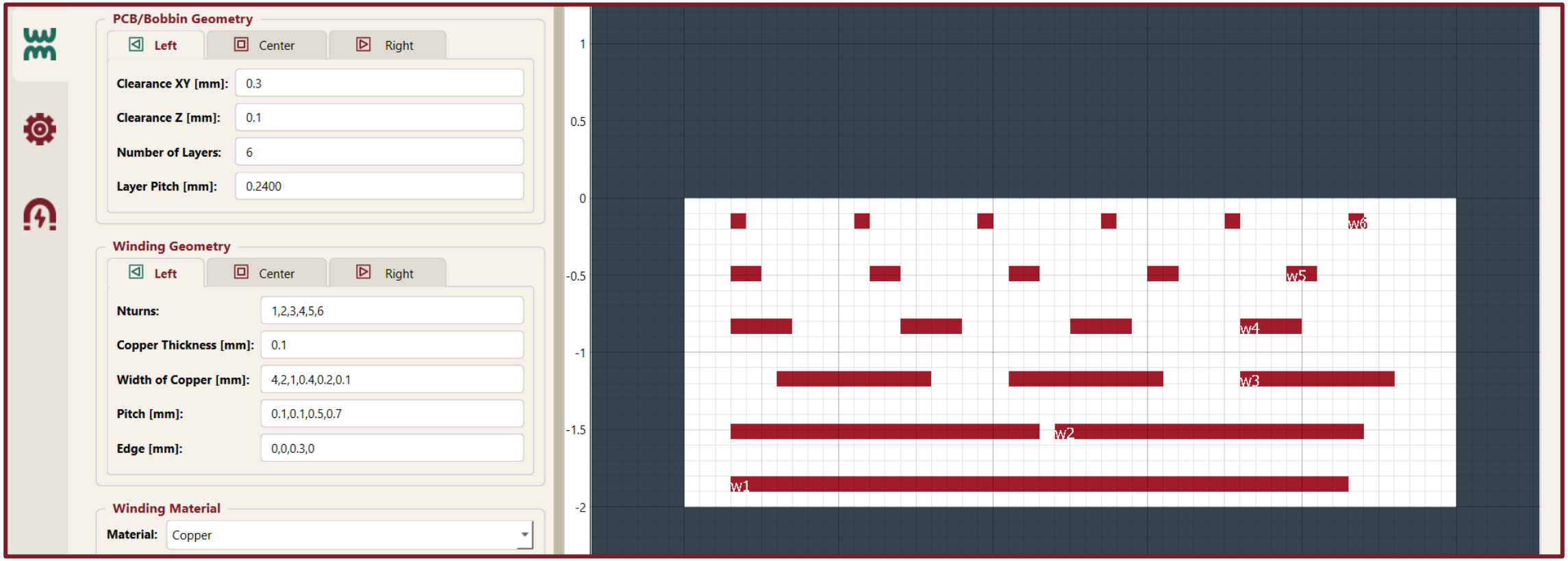
After defining the board structure, move to the **Winding Geometry section** to specify the physical dimensions of the tracks.

- **Nturns** - The number of turns per layer.
- **Copper Thickness** - The vertical thickness of the PCB copper trace.
- **Width of Copper** - The horizontal width of the copper trace.
- **Pitch** - The spacing between adjacent turns on the exact same layer.
- **Edge** - The physical margin or distance from the edge of the PCB.

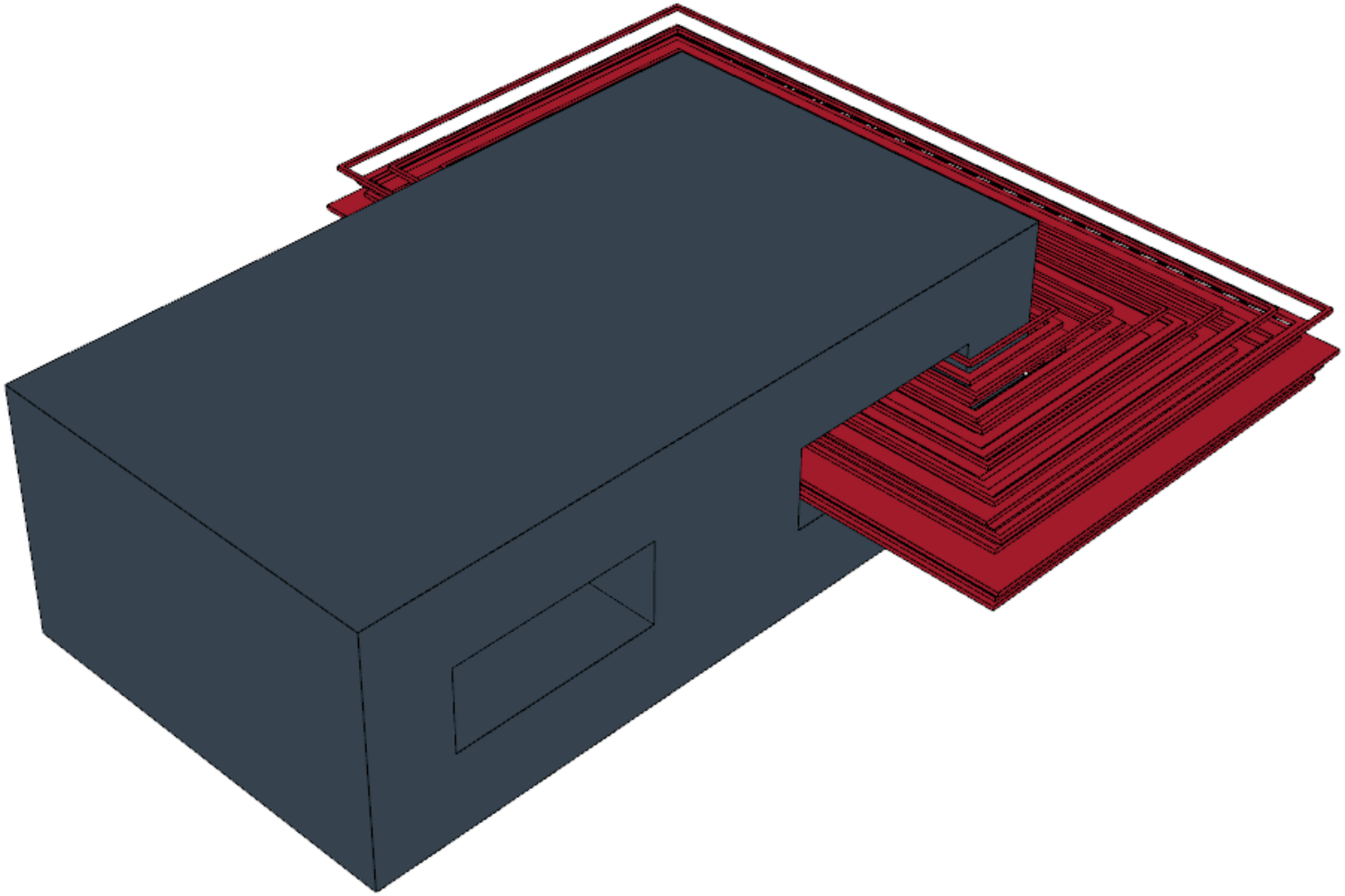
PCB Distribution parameters



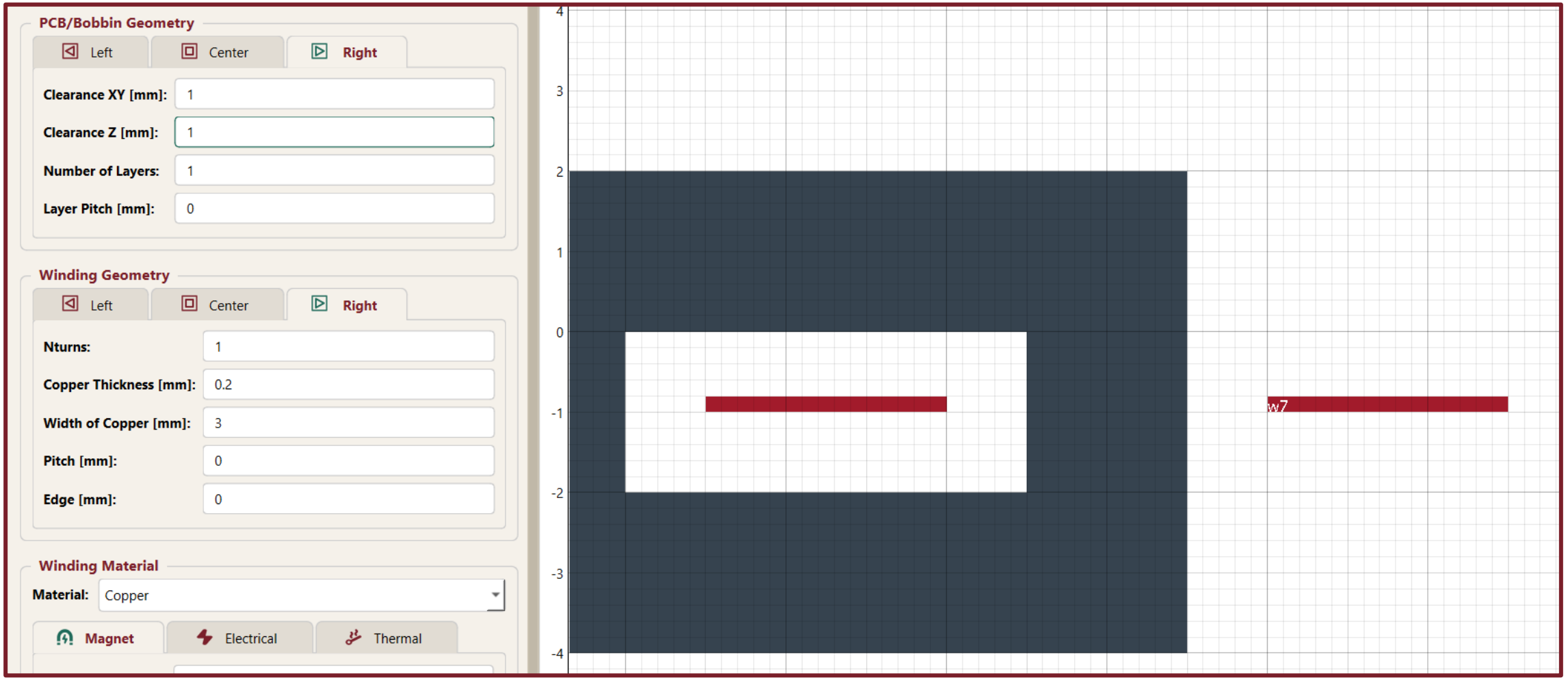
Example


PCB/Bobbin Geometry
Left
Center
Right
Clearance XY [mm]: 0.3
Clearance Z [mm]: 0.1
Number of Layers: 6
Layer Pitch [mm]: 0.2400
Winding Geometry
Left
Center
Right
Nturns: 1,2,3,4,5,6
Copper Thickness [mm]: 0.1
Width of Copper [mm]: 4,2,1,0.4,0.2,0.1
Pitch [mm]: 0.1,0.1,0.5,0.7
Edge [mm]: 0,0,0.3,0
Winding Material
Material: Copper
1
0.5
0
-0.5
-1
-1.5
-2
w1
w2
w3
w4
w5
w6

3D View of the example

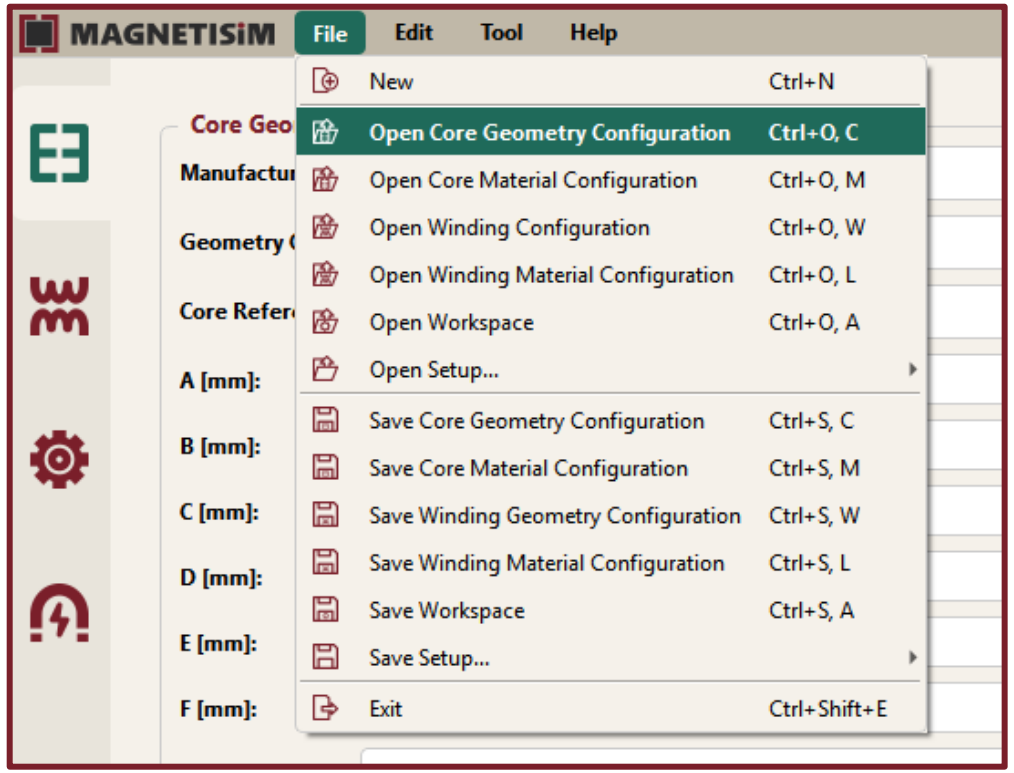


Defining simple winding



Winding: PCB – *.json

All the winding parameters you carefully configured are structured and saved in a *.json file format. This JSON file dynamically stores specific values for different sections of the core, such as the left, center, and right legs (e.g., "ClearanceXY_Left", "Nlayers_Center", "WidthCopper_Right").This standard format makes it incredibly easy to save your workspace, load previous configurations, or share templates via the MAGNETISiM GitHub repository.




```
{
    "ConductorType": "PCB",
    "ClearanceXY_Left": 1.0,
    "ClearanceXY_Center": 0.0,
    "ClearanceXY_Right": 1.0,
    "ClearanceZ_Left": 2.0,
    "ClearanceZ_Center": 10.0,
    "ClearanceZ_Right": 1.0,
    "Nlayers_Left": 3,
    "Nlayers_Center": 3,
    "Nlayers_Right": 1,
    "LayerPitch_Left": [
        # per layers,
    ],
    "LayerPitch_Center": [
        # per layers,
    ],
    "LayerPitch_Right": [
        # per layers,
    ],
    "Nturns_Left": [
        # per layers,
    ],
    "Nturns_Center": [
        # per layers,
    ],
    "Nturns_Right": [
        # per layers,
    ],
    "CopperThickness_Left": [
        # per layers,
    ],
..... Continue→
```

```
    "CopperThickness_Center": [
        # per layers,
    ],
    "CopperThickness_Right": [
        # per layers,
    ],
    "WidthCopper_Left": [
        # per layers,
    ],
    "WidthCopper_Center": [
        # per layers,
    ],
    "WidthCopper_Right": [
        # per layers,
    ],
    "Pitch_Left": [
        # per layers,
    ],
    "Pitch_Center": [
        # per layers,
    ],
    "Pitch_Right": [
        # per layers,
    ],
    "Edge_Left": [
        # per layers,
    ],
    "Edge_Center": [
        # per layers,
    ],
    "Edge_Right": [
        # per layers,
    ]
}
```

MAGNETISiM

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