

# Getting started

## TI Precision Labs – TI Magnetic Sense Simulator (TIMSS)

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# Navigation menu

The screenshot displays the TI Magnetic Sense Simulator (TIMSS) web application. At the top, a red navigation bar contains the text "TI Magnetic Sense Simulator (TIMSS)" on the left and a user profile "Jesse" with a dropdown arrow on the right. Below the navigation bar, a left-hand menu is visible, listing the following items: "TI Home", "TIMSS Home", "TI Magnetic Sensor Products", "TIMSS User Guide", "Go to our E2E design support forum", and "Version Info". The main content area is titled "Example Reference Designs" and features three design cards. The first card is for "Angle Encoding" with a function of "Rotation" and a magnet shape of "Diametric Cylinder". The second card is for "Slide-By" with a function of "Linear" and a magnet shape of "Axial Cylinder". The third card is for "Incremental Encoding" with a function of "Rotation" and a magnet shape of "Ring". Each card includes "View details" and "Open Design" buttons. An "App Version Info" dialog box is overlaid on the right side of the screen, providing the following information:

- App Version Info**
- Current Version: 3.2.0**
- Features added:
  - Addition of TIMSS User Guide link
- Version: 3.1.2**
- Features added:
  - Addition of new sensor (TMAG3001)
  - Update of the list of TI's featured devices, which are devices highlighted by TI
- Version: 3.1.1**
- Features added:
  - Support for parameter combination in Parametric Sweep
  - Support for Dual die packages
  - Support for Additional parameters in Parametric Sweep (Material and Grade, Averaging, Maximum Input, Temperature Compensation)
  - Support for sweeping magnet parameters for specific sensors
  - Indication of maximum number of sweeps permitted vs remaining sweeps available in Parametric Sweep

# Creating a new simulation

1 Function & Magnet

2 Select Sensor

3 Preview Window

Choose Sensor

Featured Devices

Search

Filter



TMAG3001



TMAG6180-Q1



TMAG6181-Q1



TMAG5170D-Q1



TMAG5173-Q1



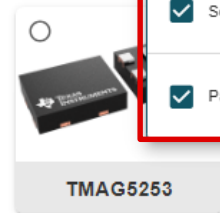
TMAG5170-Q1



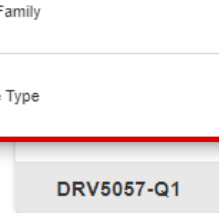
TMAG5273



TMAG5170



TMAG5253



DRV5057-Q1



DRV5055-Q1



DRV5056-Q1



DRV5057



DRV5056



DRV5055



DRV5053-Q1



DRV5053



TMAG5233



TMAG5213



TMAG5131-Q1



Selected Sensor

No sensor Selected

Choose Later


Back

Next

# Reference designs

My Designs


Search

  
No Design Files found

[Import design file](#) [Create new design](#)

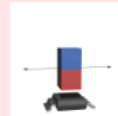
Example Reference Designs

Search




Angle Encoding  
Function: Rotation      Magnet shape: Diametric Cylinder

[View details](#) [Open Design](#)



Slide-By  
Function: Linear      Magnet shape: Axial Cylinder

[View details](#) [Open Design](#)



Incremental Encoding  
Function: Rotation      Magnet shape: Ring

[View details](#) [Open Design](#)



# Naming and saving a simulation

The screenshot displays the TI Magnetic Sense Simulator (TIMSS) interface. The main workspace shows a 3D model of a cylindrical magnet with two poles, one colored blue and the other red. Below the magnet is a sensor assembly. A red 'Simulate' button is located at the bottom center of the workspace.

The right-hand panel contains configuration settings for the magnet:

- Magnet Specifications**
  - Magnet Shape: Diametric Cylinder
  - Poles: 2
  - Magnet Material: Sintered Neodymium I...
  - Material Grade: N42
- Select Remanence Value**: Average Remanence ...
- Remanence (Br)**: 1310 mT at 20°C
- Temperature**: 20 °C
- Temperature Coefficient**: -0.12 %/°C
- Coercivity**: 12 KOe

Below these settings are expandable sections for **Magnet Geometry** and **Magnet Motion**.

# Exporting a simulation

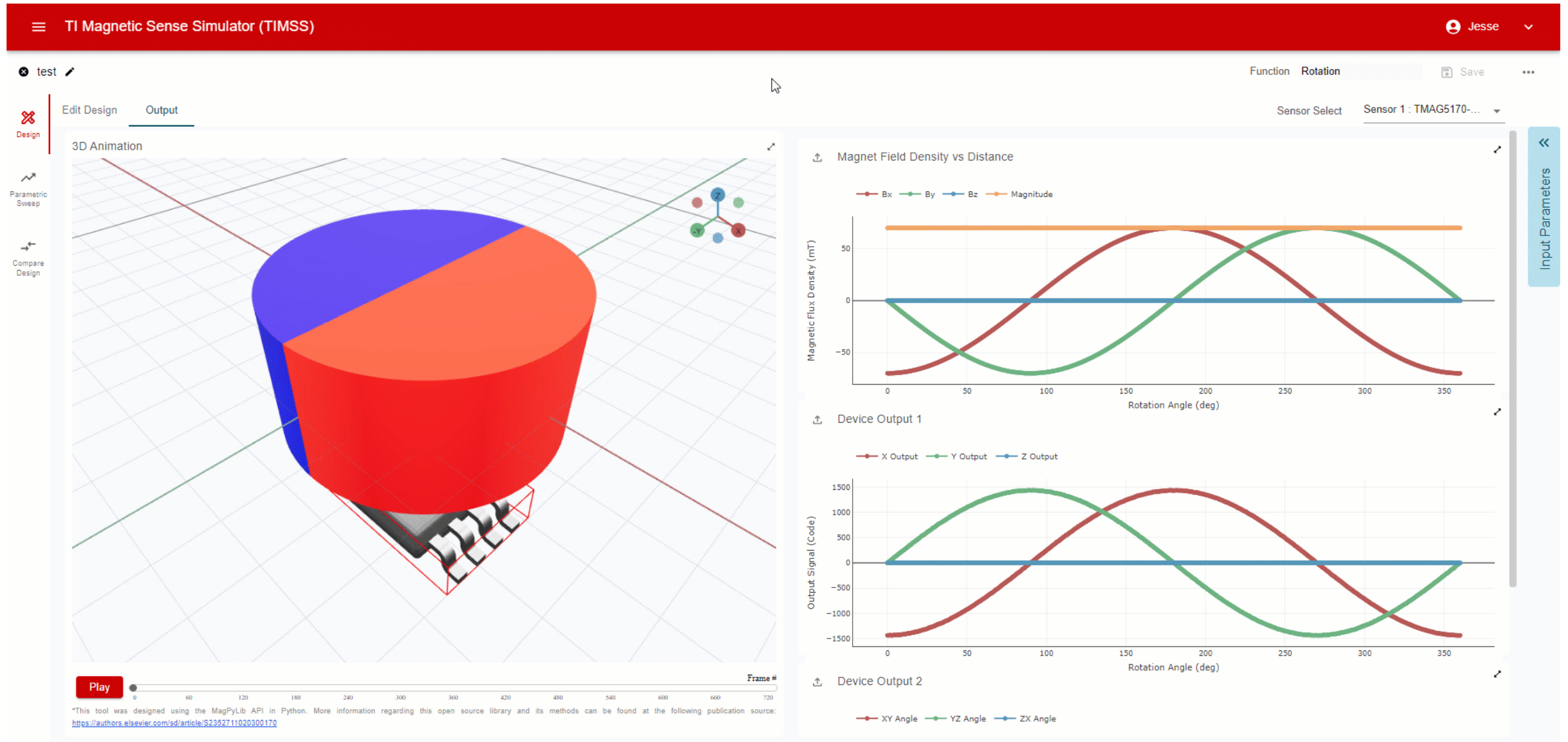
The screenshot displays the TI Magnetic Sense Simulator (TIMSS) interface. The top navigation bar includes a hamburger menu, the title "TI Magnetic Sense Simulator (TIMSS)", a user profile for "Jesse", and a "Function" dropdown set to "Rotation". Below the navigation bar, there are tabs for "Edit Design" and "Output", with "Output" being the active tab. On the left side, there is a sidebar with icons for "Design", "Parametric Sweep", and "Compare Design".

The main area is divided into two sections. The left section, titled "3D Animation", shows a 3D model of a cylindrical sensor with a red top and bottom and a blue side. A coordinate system with X, Y, and Z axes is visible. Below the 3D model is a "Play" button and a timeline labeled "Frame #" ranging from 0 to 720. A small text block at the bottom of this section reads: "This tool was designed using the MagPyLib API in Python. More information regarding this open source library and its methods can be found at the following publication source: <https://authors.elsevier.com/td/article/S2352711020300170>".

The right section contains three data plots, all sharing a common x-axis of "Rotation Angle (deg)" from 0 to 350. The top plot, "Magnet Field Density vs Distance", shows "Magnetic Flux Density (mT)" on the y-axis. It features four series: Bx (red), By (green), Bz (blue), and Magnitude (orange). Bx and By are sinusoidal waves, Bz is a flat line at 0, and Magnitude is a flat line at approximately 60 mT. The middle plot, "Device Output 1", shows "Output Signal (Code)" on the y-axis. It features three series: X Output (red), Y Output (green), and Z Output (blue). X and Y outputs are sinusoidal waves, while Z output is a flat line at 0. The bottom plot, "Device Output 2", shows "Output Signal (Code)" on the y-axis. It features three series: XY Angle (red), YZ Angle (green), and ZX Angle (blue). All three series are sinusoidal waves.

On the far right, there is a vertical sidebar labeled "Input Parameters" with a double-left arrow icon.

# Navigating plots



# Importing a simulation

The screenshot displays the TI Magnetic Sense Simulator (TIMSS) interface. The main workspace shows a 3D model of a cylindrical magnet with a red top and blue bottom, positioned above a stack of grey and white components. A red box highlights a small rectangular area on the top surface of the magnet. The right-hand side features a settings panel for the magnet, with a dropdown menu open showing options: 'Save as...', 'Export Input Parameters to JSON', 'Export Report to CSV', 'Export Report to PDF', and 'Import Input Parameters from JSON'. The 'Import Input Parameters from JSON' option is highlighted with a red border. Below the dropdown, the magnet specifications are listed: Magnet Shape (Diametric Cylinder), Poles (2), Magnet Material (Sintered Neodymium I...), and Material Grade (N42). A table of material properties is also visible, including Remanence (Br) at 1310 mT at 20°C, Temperature (20 °C), Temperature Coefficient (-0.12 %/°C), and Coercivity (12 KOe). The bottom of the interface has a 'Simulate' button.

TI Magnetic Sense Simulator (TIMSS)

Untitled \* [edit icon]

Design [edit icon] Output

Parametric Sweep [sweep icon]

Compare Design [compare icon]

Function Rotation [save icon] Save [more icon]

Magnet

Magnet Specification

Magnet Shape: Diametric Cylinder

Poles: 2

Magnet Material: Sintered Neodymium I...

Material Grade: N42

Select Remanence Value: Average Remanence ...

Remanence (Br)	Temperature
1310 mT at 20°C	20 °C
Temperature Coefficient	Coercivity
-0.12 %/°C	12 KOe

Magnet Geometry [collapse icon]

Magnet Motion [collapse icon]

Simulate



# Learn More

- TI Magnetic Sense Simulator Product Folder  
<https://www.ti.com/TIMSS>
- TI Magnetic Sense Simulator User's Guide  
<https://www.ti.com/lit/ug/slyu067/slyu067.pdf>
- TI Magnetic Sense Simulator App Brief  
<https://www.ti.com/lit/ab/slya083/slya083.pdf>
- Position Sensing Demo Video Series  
<https://www.ti.com/video/series/position-sensing-demos.html>
- TI Precision Labs: Magnetic Sensor Training Videos  
<https://www.ti.com/video/series/precision-labs/ti-precision-labs-magnetic-sensors.html>
- Sensors E2E Forum  
<https://e2e.ti.com/support/sensors-group/sensors/f/sensors-forum>
- TI Magnetic Sensor Portfolio  
<https://www.ti.com/magneticsensors>

To start your simulation now, visit:  
[www.ti.com/timss](http://www.ti.com/timss)