User's Guide

SLIDEBY-MAG-ACC User's Guide

ABSTRACT

This document serves to accompany the design files for the SLIDEBY-MAG-ACC attachment for the magnetic sensing evaluation kits (EVMs) that interface with TI-SCB such as the TMAG5170 EVM. In addition to this guide, the design files are provided as an example and may be used in a 3D printer to generate a demonstration of tracking linear movement using a three-dimensional Hall effect sensor.

Note

Design files described in this document can be downloaded from Slide-By Design Files.

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1 Introduction

This SLIDEBY-MAG-ACC attachment uses an N42 grade cylindrical magnet as a magnetic field source to demonstrate the ability of magnetic sensors to track linear motion of a nearby magnet. The magnet is glued into the slider object, which then can pass freely down the length of the slider track. Slider options for both a vertically aligned or horizontally aligned magnet are included in the EVM kit. More details about this function are described in *Tracking Slide-By Displacement with Linear Hall-Effect Sensors*.

Examples of expected magnetic field data captured using the TMAG5170UEVM are shown in Figure 1-1 and Figure 1-2.

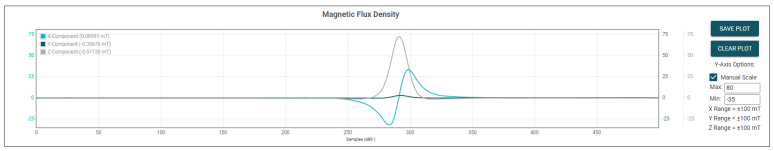

Figure 1-1. Slide-by With Vertical Magnet Alignment

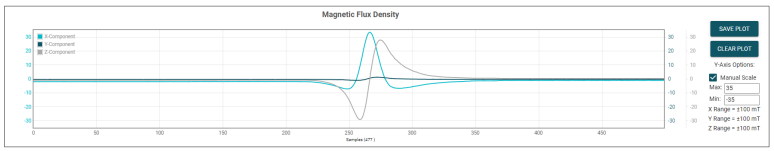

Figure 1-2. Slide-by With Horizontal Magnet Alignment

Nylon components were selected as these components are non-magnetic and do not interfere with the magnetic field and bond well when glued.

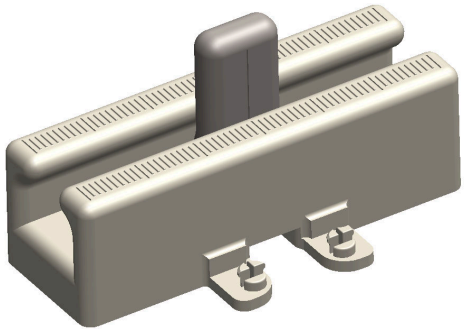

Figure 1-3. TMAG5170 Slide-By Attachment

This function can be further explored using the slide-by reference design in the TI Magnetic Sense Simulator tool (TIMSS) available at https://webench.ti.com/timss/.

Figure 1-4. TIMSS Slide-by Reference Design

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2 Assembly Guide

SLIDEBY-MAG-ACC kits ordered from TI.com come pre-assembled, but in cases where the kit is printed locally, please follow steps 1-3 described below.

Item	Description	Quantity
Slider Track	Track.STL	1
Slider	Slider.STL	1
1/4" dia. x 3/16" thick Cylindrical magnet	NdFeB (N42): available at K&J Magnetics	1
8333-20G	Super Glue	0.02oz

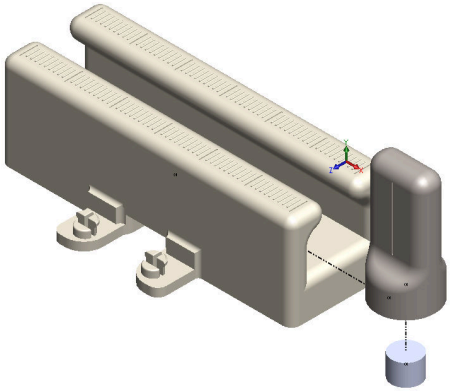

Figure 2-1. Exploded View

1. **Print the Slider (Slider.STL).**

   This piece carries the magnet and provides a grip to control the magnet motion in the track. Additionally, a centerline is visible to assist with locating the magnet center.

Figure 2-2. Slider

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2. **Glue the magnet into the bottom opening of the slider.**

   Glue the magnet into the slider. The magnet should seat flush with the bottom of the slider.

Figure 2-3. Complete Slider Assembly

3. **Print the Slider Track (Track.STL).**

   This is the central fixture of the assembly. The slider track clips to the EVM and provides a guided path for the magnet to pass over the sensor. The markings along the top of the track are spaced at 1mm intervals.

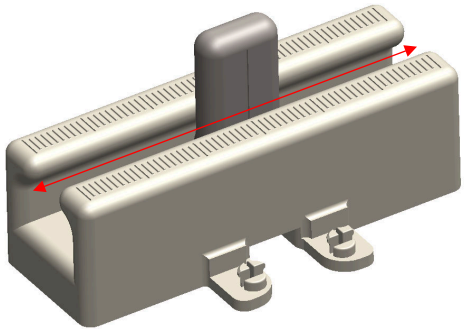

Figure 2-4. Slide-By Function

4. **Attach the slider track to the magnetic sensing EVM.**

   Slide the platform end of the EVM underneath the window in the track, and align the cut holes in the EVM above the circular clips in the track base. Apply some downward force to clip the EVM into the track base. The first insertion may require more effort, but subsequent insertions should snap easily. Once the base is attached to the EVM, insert the desired slider through the opening at either end of the track.

   Connect the EVM to the TI-SCB, and follow the relevant instructions to program the device provided in the device-specific EVM user's guide.

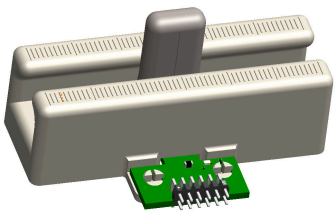

Figure 2-5. EVM Attach

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3 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from Revision * (September 2021) to Revision A (April 2024)	Page
• Updated the document to reflect release of the SLIDEBY-MAG-ACC on TI.com as a generic attachment for EVMs compatible with TI-SCB	1

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