ASEK-31301

A31301 Evaluation Kit User Guide

DESCRIPTION

The ASEK-31301-IC06-SUBKIT-T allows for quick evaluation of the A31301 3D sensor. The A31301 is a three-axis Hall-effect sensor IC—a flexible magnetic sensor capable of measuring the raw field strength in any one, two, or three axes, as well as calculating the angle in up to any two user-defined planes. The board includes an A31301 device and test points. The board is perforated, allowing the snapping off of the sensor board for use in custom magnetic setups.

FEATURES

The evaluation kit includes a microcontroller for communicating with the A31301. Evaluation software is available to demonstrate the basic functionality and configurability of the A31301 device.

EVALUATION KIT CONTENTS

- ASEK-31301 Evaluation Board (ASEK-31301-IC06-SUBKIT-T)

Table of Contents

Additional Hardware and Software Required

- Micro-B USB communication cable
- Evaluation board software, available on the website: https://registration.allegromicro.com/
- Personal computer capable of running evaluation board software

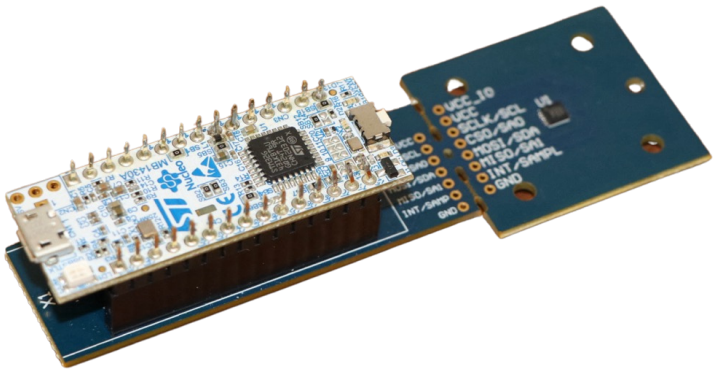

Figure 1: ASEK31301 Evaluation Board (ASEK-31301-IC06-SUBKIT-T)

USING THE EVALUATION BOARD

The Allegro GUIs provided to evaluate magnetic position sensors contain a variety of features to assist in the evaluation of devices. For this reason, not all features are covered by this document. The focus of this procedure is to familiarize the user with setting up the GUI to communicate with the ASEK-31301. For additional information on available GUI features, refer to the user manual on the Allegro Software Portal.

Downloading the Software

1. Sign into the Allegro Software Portal: https://registration.allegromicro.com/login#/
2. Click Find A Part to open the Available Parts page.
3. Enter A31301 into the search box.
4. Click View on the A31301 Position Sensors row.
5. Within the A31301 Product page, click the Download box for the Demonstration Application.

   A. Additional information is available on the software portal including a detailed user manual for the software GUI.

Installing the Software

Place the ZIP file where you want the software to be run. Unpack the ZIP file. A folder called Allegro A31301 Demonstration V2.0.x should have been created. All the required files should be in the folder.

Starting the Application

1. Double click on the application. It is the file called Allegro A31301 Demonstration.exe in the Allegro A31301 Demonstration V2.0.x folder. The main window will appear (see Figure 2).

Figure 2: Main Window

2. Connect one end of the USB communications cable to a personal computer.
3. Connect the other end of the USB communications cable to the USB port on the ASEK-31301 module.
4. A window may appear that looks like the one in Figure 3.

Allegro MicroSystems
955 Perimeter Road
Manchester, NH 03103-3353 U.S.A.
www.allegromicro.com

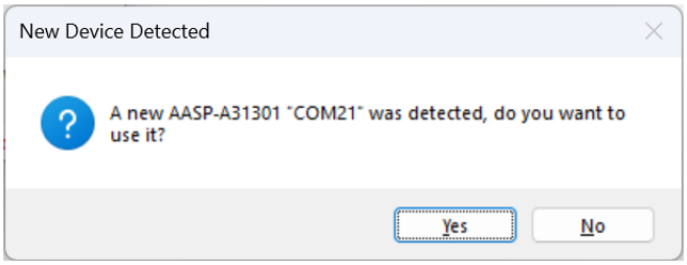

Figure 3: New Device Detected Dialog

5. Click the Yes button.

DEVICE SETUP

Reading the sensor values

1. Make sure the Demo tab is shown.
2. Click Power On
3. Click Start Reads.
4. The angle will be displayed in the compass on the lefthand section of the window. The X, Y, and Z values will be added to the left edge of the graph which is on the righthand side of the window.
5. To stop the reading, click Stop Reads.

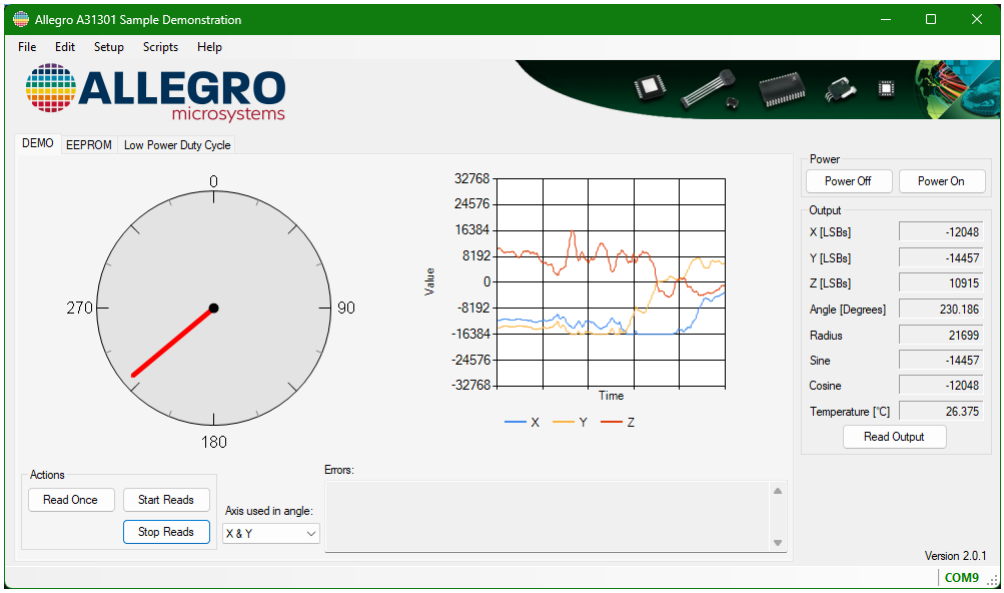

Figure 4: Sensor readings started and stopped

Reading Memory

Reading a Field

1. Select the EEPROM tab.
2. In the memory box, the Show popup should be showing All Fields. If it is not, then select All Fields from the popup menu.
3. Scroll down the table to the SPARE_15 row.
4. Click on the checkbox that is on the left side of the SPARE_15 row.

Allegro MicroSystems
955 Perimeter Road
Manchester, NH 03103-3353 U.S.A.
www.allegromicro.com

5. Click Read Selected. The memory field will appear similar to Figure 5.

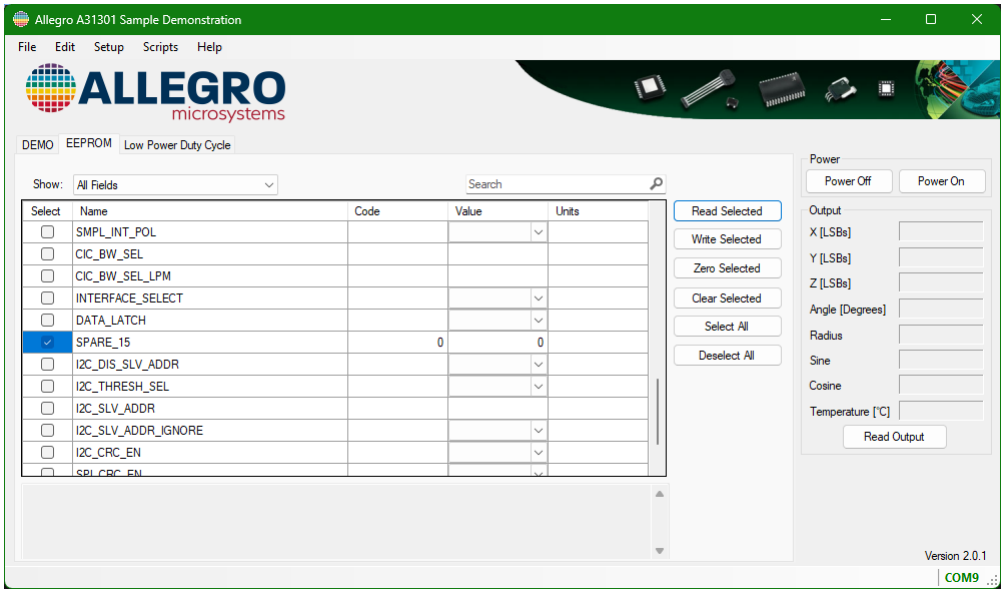

Figure 5: Reading a Field

Reading a Memory Location

1. Click on the Show popup menu and select All Memory Locations.
2. Click on the checkbox that is on the left side of the row labeled 0x15.
3. Click on Read Selected. The window should appear as it does in Figure 6. The value of SPARE_15 is at bits 2 to 7 of location 0x15.

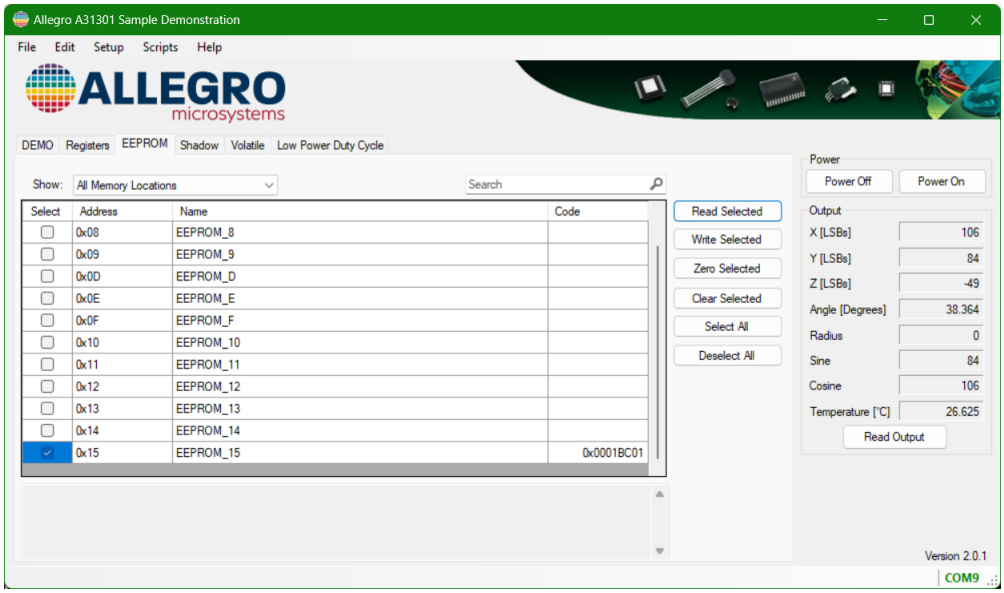

Figure 6: Reading a Memory Location

Writing to the Device

1. In the Memory field, select All Fields from the Show popup menu.
2. Scroll down the table to the SPARE_15 row.
3. Click in the text entry box in the Code column of the SPARE_15 row.

Allegro MicroSystems
955 Perimeter Road
Manchester, NH 03103-3353 U.S.A.
www.allegromicro.com

4. Type 16 and press Enter. The Select checkbox should be checked and the cell in the Value column will be set to 16.
5. Click Write Selected. The window should appear as it does in Figure 7.
6. To verify that the SPARE_15 field was written to the device:
   A. Click Clear Selected. The values in the Code and Value cells should disappear.
   B. Click Read Selected. The values that were written will reappear in the Code and Value cells.

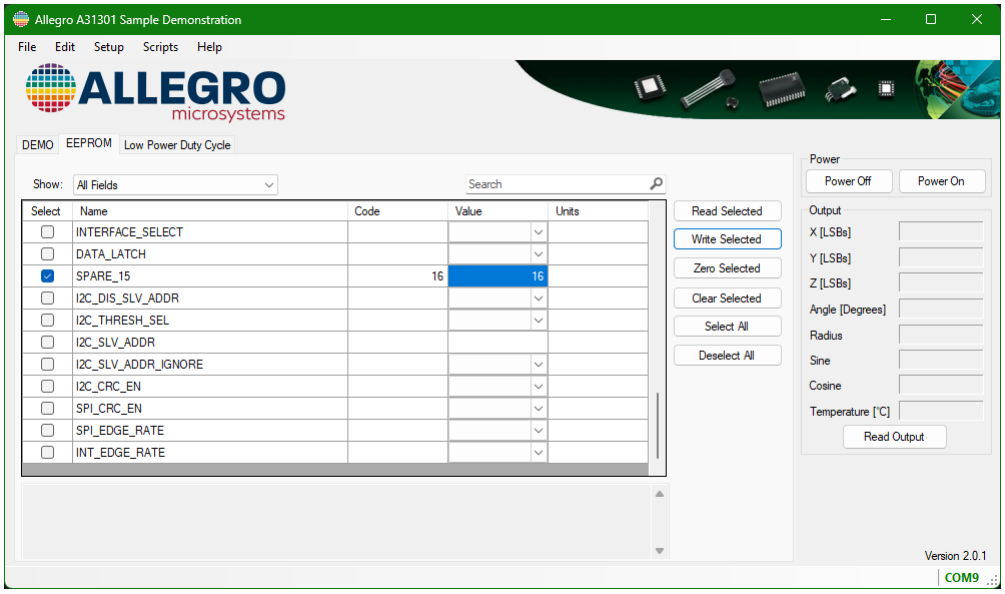

Figure 7: Writing a field

Writing a Memory Location

Writing to a memory location is done the same way.

1. From the Show popup menu, select All Memory Locations.
2. To ensure that there is not any memory locations selected, click Deselect All.
3. Scroll down the table and click the checkbox in the Select column next to 0x15.
4. Click Read Selected. The value in the last two digits in the Code column should be 40 when the device is communicating using I^2C and 41 when communicating with SPI.
5. If communicating using I^2C, change the last two digits to 10; otherwise, change the last two digits to 11, and press Enter.
6. Click Write Selected.
7. To verify that the memory location has been changed, select All Fields from the Show popup menu and scroll down to the spare_15 row. Click Read Selected and the field should now read 4.

Allegro MicroSystems
955 Perimeter Road
Manchester, NH 03103-3353 U.S.A.
www.allegromicro.com

SCHEMATIC

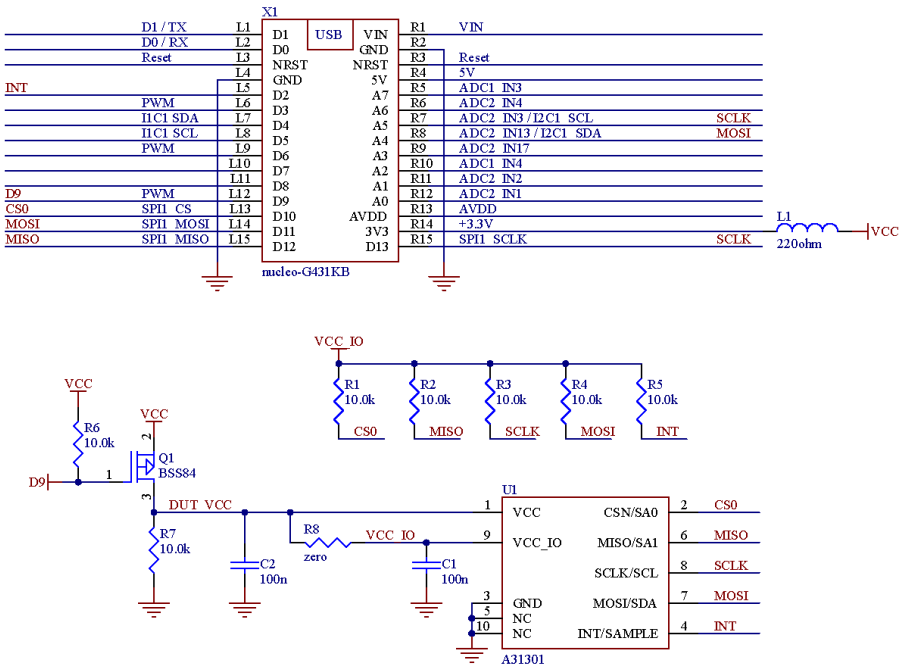

Figure 8: Board Schematic

Allegro MicroSystems
955 Perimeter Road
Manchester, NH 03103-3353 U.S.A.
www.allegromicro.com

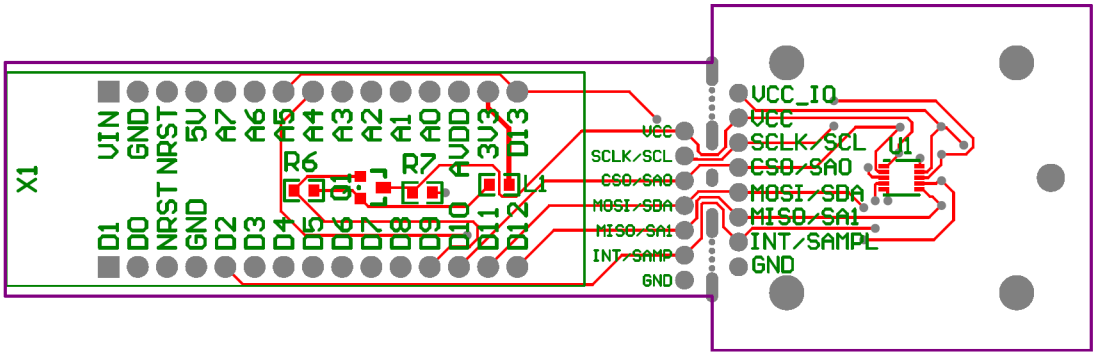

Figure 9: Board Top Layout

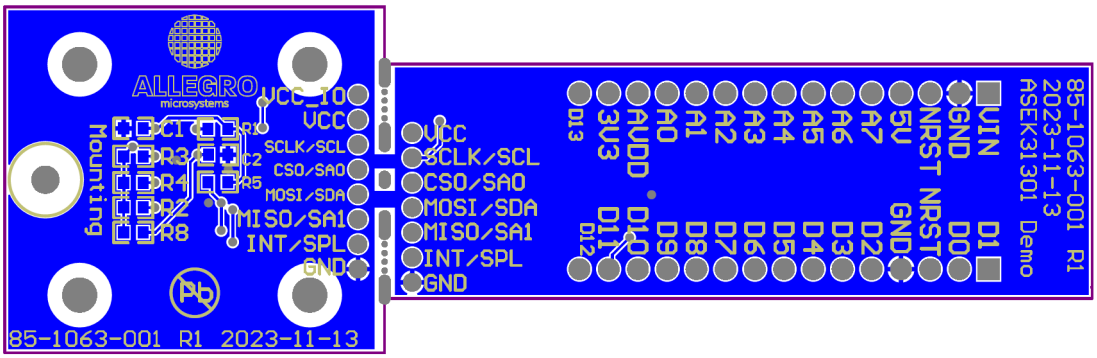

Figure 10: Board Bottom Layout

Table 1: A31301 Evaluation Board Bill of Materials - ASEK-31301-IC06-SUBKIT-T

ELECTRICAL COMPONENTS				
Designator	**Quantity**	**Description**	**Manufacturer**	**Manufacturer Part Number**
U1	1	IC, DFN10, sensor	Allegro	A31301EEJASR-XYZ-IC-06
X1	1	Module, through-hole, Arduino module // comes with pins	STMicro	nucleo-G431KB
C1, C2	2	Capacitor, 0603, mono, X7R, 50 V, 100 nF	AVX	06035C104K4T2A
R1, R2, R3, R4, R5, R6, R7	7	Resistor, 0603, 100 mW, thick film, 1%, 10.0 kΩ	Yageo	RC0603FR-0710KL
L1	1	Ferrite bead, 0603, 220 Ω, 1.4 A, 0.1 Ω DCR	Murata	BLM18PG221SN1D
R8	1	Jumper, 0603, zero ohm jumper	Yageo	RC0603JR-070RL
Q1	1	Transistor, SOT-23, PFET	Diodes Inc	BSS84-7-F
header1, header2	2	Connector, through-hole, header, 1 × 15, 100 mil pitch	Sullins	PPPC151LFBN-RC
PCB	1	PCB, as from 85-1063-001 Rev 1 gerber files	Allegro	-

ADDITIONAL SUPPORT

Software support is available on our website: https://registration.allegromicro.com/

Allegro MicroSystems
955 Perimeter Road
Manchester, NH 03103-3353 U.S.A.
www.allegromicro.com

REVISION HISTORY

Number	Date	Description
–	September 15, 2023	Initial release
1	March 20, 2025	Updating for new revision of evaluation kit and software

Allegro MicroSystems
955 Perimeter Road
Manchester, NH 03103-3353 U.S.A.
www.allegromicro.com