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AN-5085
FIS1100 Board Level Calibration

Summary

This application note lists the step-by-step process to determine the initial calibration parameters of the FIS1100 after the sensor has been mounted to the printed circuit board. This is a process referred to as Board Level Calibration (BLC) [1].

Figure 1. FIS1100 aligned with Local coordinate frame (L). The orientation of the FIS1100 is identified by pin1, indicated by the small grey dot on the FIS1100 sensor (S).

Procedure

Figure 1 shows the FIS1100 (S) aligned with a Local reference frame (L). The Local reference frame L is defined with Z pointing up, aligned with the acceleration due to gravity. The orientation of the FIS1100, indicated by the reference axes, is identified by pin1 (grey dot). The procedure to carry out the BLC is summarized as follows:

- The FIS1100 must be placed on a substantially level surface (e.g. a table). The vertical axis Z_S of the FIS1100 needs to point up and be aligned with the vertical axis Z_L, at a maximum angle deviation of ±3 deg, with a lower divergence leading to a better calibration result. The direction of the horizontal axes X_S and Y_S with respect to L can be arbitrary.
- The BLC data collection and computation is next carried out, refer to FEBFIS1100 Evaluation Board User Guide [1] for implementation details.
  - For the duration of the BLC algorithm (500 ms), the sensor must not move and not be subject to any vibrations or rotations.
- If the BLC procedure indicates success, the results of the BLC should be stored in non-volatile memory of the host processor and be used to initialize the XKF3 sensor fusion library [1]. If the BLC procedure indicates a warning or failure, the BLC must be repeated.

References

[1] FEBFIS1100 Evaluation Board User Guide, *Fairchild Semiconductor user guide, 2015.*
[2] FIS1100 Datasheet - *"FIS1100 - 6D Inertial Measurement Unit with Motion Co-Processor and Sensor Fusion Library", Fairchild Semiconductor datasheet, 2015*

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FIS1100 Product Folder

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