BLUE TECHNIX

Hardware User Manual

EXT-BF5xx-ADIS16350 V1.x

...maximum performance at minimum space

Contact

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The information herein is given to describe certain components and shall not be considered as a guarantee of characteristics.

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Information

For further information on technology, delivery terms and conditions and prices please contact Bluetechnix (http://www.bluetechnix.com).

Warning

Due to technical requirements components may contain dangerous substances.

The Core Modules and development systems contain ESD (electrostatic discharge) sensitive devices. Electro-static charges readily accumulate on the human body and equipment and can discharge without detection. Permanent damage may occur on devices subjected to high-energy discharges. Proper ESD precautions are recommended to avoid performance degradation or loss of functionality. Unused Core Modules and Development Boards should be stored in the protective shipping

BLACKFIN Products

Core Modules:

CM-BF533:	Blackfin Processor Module powered by Analog Devices' single core ADSP-BF533 processor; up to 600MHz, 32MB SDRAM, 2MB flash, 2x60 pin expansion connectors and a size of 36.5x31.5mm.
CM-BF537E:	Blackfin Processor Module powered by Analog Devices' single core ADSP-BF537 processor; up to 600MHz, 32MB SDRAM, 4MB flash, integrated TP10/100 Ethernet physical transceiver, 2x60 pin expansion connectors and a size of 36.5x31.5mm.
CM-BF537U:	Blackfin Processor Module powered by Analog Devices' single core ADSP-BF537 processor; up to 600MHz, 32MB SDRAM, 4MB flash, integrated USB 2.0 Device, 2x60 pin expansion connectors and a size of 36.5x31.5mm.
TCM-BF537:	Blackfin Processor Module powered by Analog Devices' single core ADSP-BF537 processor; up to 500MHz, 32MB SDRAM, 8MB flash, a size of 28x28mm, 2x60 pin expansion connectors, Ball Grid Array or Border Pads for reflow soldering, industrial temperature range -40°C to +85°C.
CM-BF561:	Blackfin Processor Module powered by Analog Devices' dual core ADSP-BF561 processor; up to 2x 600MHz, 64MB SDRAM, 8MB flash, 2x60 pin expansion connectors and a size of 36.5x31.5mm.
CM-BF527:	The new Blackfin Processor Module is powered by Analog Devices' single core ADSP-BF527 processor; key features are USB OTG 2.0 and Ethernet. The 2x60 pin expansion connectors are backwards compatible with other Core Modules.
CM-BF548:	The new Blackfin Processor Module is powered by Analog Devices' single core ADSP-BF548 processor; key features are 64MB DDR SD-RAM 2x100 pin expansion connectors.
TCM-BF518:	The new Core Module CM-BF518 is powered by Analog Devices' single core ADSP-BF518 processor; up to 400MHz, 32MB SDRAM, up to 8MB flash. The 2x60 pin expansion connectors are backwards compatible with other Core Modules.

Development Boards:

EVAL-BF5xx:	Low cost Blackfin processor Evaluation Board with one socket for any Bluetechnix Blackfin Core Module. Additional interfaces are available, e.g. an SD-Card.
DEV-BF5xxDA-Lite:	Get ready to program and debug Bluetechnix Core Modules with this tiny development platform including an USB-Based Debug Agent. The DEV-BF5xxDA-Lite is a low cost starter development system including a VDSP++ Evaluation Software License.
DEV-BF548-Lite:	Low-cost development board with one socket for Bluetechnix CM-BF548 Core Module. Additional interfaces are available, e.g. an SD-Card, USB and Ethernet.

DEV-BF548DA-Lite: Get ready to program and debug Bluetechnix CM-BF548 Core Module with this tiny development platform including an USB-Based Debug Agent. The DEV-BF548DA-Lite is a low-cost starter development system including a VDSP++ Evaluation Software License.

EXT-Boards: The following Extender Boards are available: EXT-BF5xx-AUDIO, EXT-BF5xx-VIDEO, EXT-BF5xx-CAM, EXT-BF5xx-EXP-TR, EXT-BF5xx-USB-ETH2, EXT-BF5xx-AD/DA, EXT-BF548-EXP and EXT-BF518-ETH. Furthermore, we offer the development of customized extender boards for our customers.

Software Support:

BLACKSheep: The BLACKSheep VDK is a multithreaded framework for the Blackfin processor family from Analog Devices that includes driver support for a variety of hardware extensions. It is based on the real-time VDK kernel included within the VDSP++ development environment.

LabVIEW: LabVIEW embedded support for Bluetechnix Core Modules is done by Schmid-Engineering AG: http://www.schmid-engineering.ch

uClinux: All the Core Modules are fully supported by uClinux. The required boot loader and uClinux can be downloaded from: http://blackfin.uClinux.org.

Upcoming Products and Software Releases:

Keep up-to-date with all the changes to the Bluetechnix product line and software updates at: http://www.bluetechnix.com .

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BLACKFIN Design Service

Based on more than five years of experience with Blackfin, Bluetechnix offers development assistance as well as custom design services and software development.

1 Introduction

The EXT-BF5xx-ADIS16350 Board is an extender plug-on board for the EVAL-BF5xx (V4.x) Board, the DEV-BF5xxDA-Lite, the DEV-BF5xx or the DEV-BF5xxDA-FPGA. It features the ADIS16350 Tri-Axis Inertial Sensor from Analog Devices.

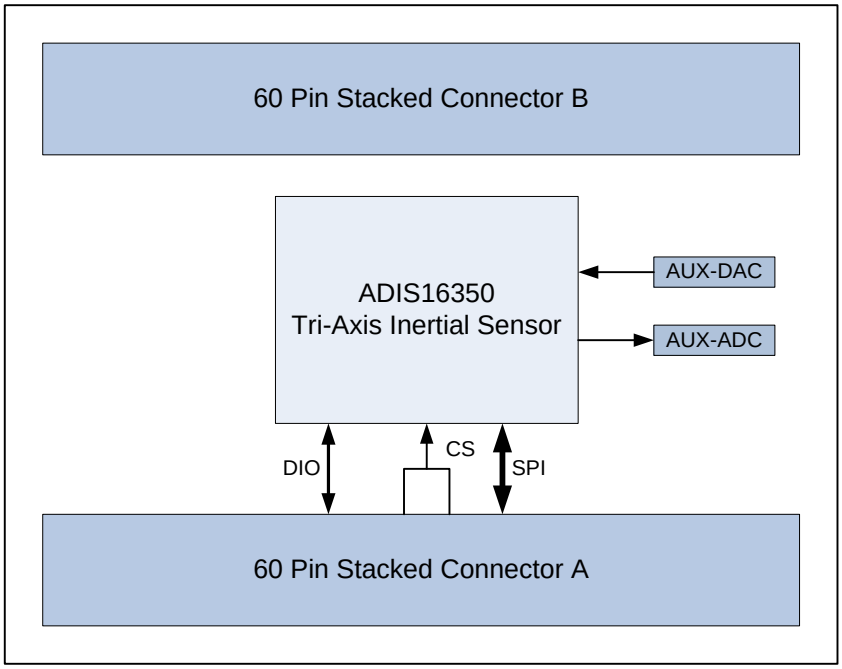


Figure 1-1: Overview of the EXT-BF5xx-ADIS16350 Board

The only component on the Extender Board is the ADIS16350 Sensor Cube with following Features:

- Tri-axis gyroscope
- Tri-axis accelerometer
- Temperature sensor
- Auxiliary DAC input
- Auxiliary ADC outpu
- 2 Auxiliary Digital IOs

For further information about the sensors refer to the Analog Devices homepage.

2 PCB

2.1 Placement

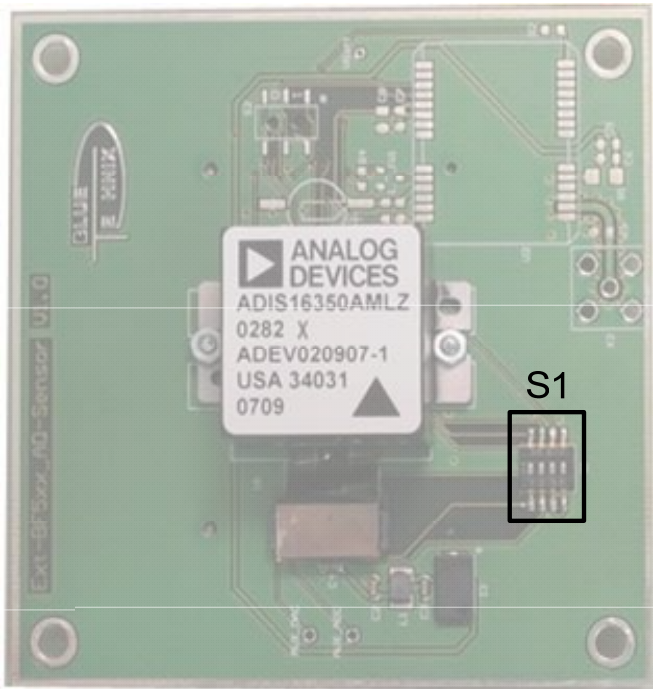


Figure 2-1: PCB Placement

2.2 Auxiliary Connectors

The auxiliary ADC and DAC are connected to the two solder pads. AUX-DAC and AUX-ADC.

2.3 DIP Switch S1

The 4-bit DIP-Switch S1 allows to disconnect the two auxiliary digital IO lines from the Core Module and to choose the chip select pin. The table Table 2-1 shows the possible options.

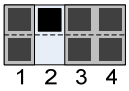
DIP Switch Setting	Pin Function	Core Module Pin
 On Off 1 2 3 4	SPI CS	53
 On Off 1 2 3 4	SPI CS	18
 On Off 1 2 3 4	Digital IO	16
 On Off 1 2 3 4	Digital IO	45

Table 2-1: DIP-Switch Settings

2.4 Blackfin PIN-Assignment

The table below shows which GPIOs are used for the relevant Core Modules inserted in the base board.

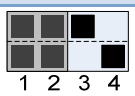
DIP-Switch Setting	Core Module:	Pin Description	Extender Pin Number
	CM-BF527	PF14	18
	CM-BF533	SPISSEL5	18
	CM-BF537x	SPISSEL5	53
	TCM-BF537x	SPISSEL5	53
	CM-BF548	PD14	18
	CM-BF561x	SPISSEL4	53

Table 2-2: SPI_CS assignment

2.5 Mechanical Outline

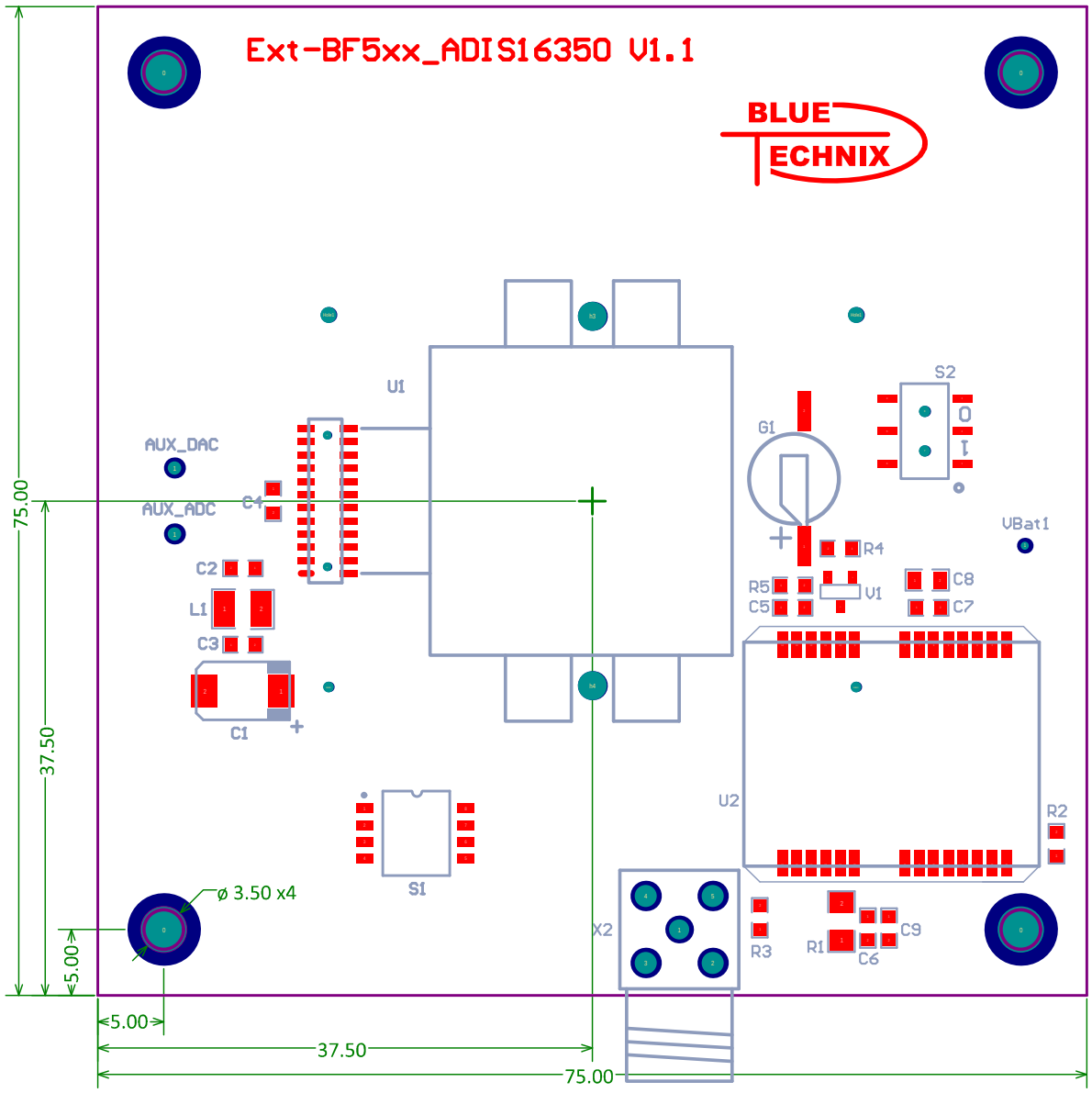


Figure 2-2: Mechanical Outline – Sensor Placement

3 Compatibility Issues

Please refer to the Bluetechnix website to see which products are compatible with the EXT-BF5xx-ADIS16350 Extender Board.

4 Software Support

4.1 BLACKSheep Driver

The current version of the BLACKSheep extender board driver can be downloaded from the Bluetechnix website (http://www.bluetechnix.com).

Refer to the "README.TXT" files within the examples to see which hardware configuration the example needs.

Please consult the software development documents.

4.2 uClinux

There is no uClinux support by default. Please refer to http://blackfin.uClinux.org for possible camera and display driver support. Bluetechnix offers the development of uClinux drivers.

4.3 LabVIEW embedded

xxxxx

5 Anomalies

For the latest information regarding anomalies for this product, please consult the product home page:

http://www.bluetechnix.com/goto/ext-bf5xx-adis16350

6 Product Changes

Version	Changes
1.0	First version

Table 6-1: Product history

7 Document Revision History

Version	Date	Document Revision
1	2010-02-09	Redesign of Manual
Pr 1	2008-12-15	Preliminary

Table 7-1: Document Revision History

A List of Figures and Tables

Figures

Tables