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ADIS544 Evaluation Board User Guide

Evaluation Board Features

- Single power connection using 5 V wall adapter and on-board LDO voltage regulators
- 10 ksps, 2-stage cascaded integrator-differentiator signal reconstruction and a robust output clock connections, with easy configuration and maximum flexibility for FIFO, SPI, or GPIO-compatible interfaces
- 3 configurable reference inputs, selectable between a single-ended or differential reference configuration
- 7 all-in-support PCB-mounted SMA connectors for system clocks
- On-board EEPROM for power-on ready configurability
- Test points
- USB connectors for PC
- Microsoft Windows-based evaluation software with simple graphical user interface via an ALIO plug-in module

Equipment Needed

- Reference system generator for reference input
- Other evaluation boards to be mirrored or test equipment
- Signal generator, spectrum analyzer, phase noise analyzer
- 5 V, 2 A DC supply
- 5 V wall supply (provided)
- USB cable (provided)

Online Resources

Required Software

- Windows Control Evaluation (ACE) Software
- ADIS544 ALIO Module

Documents Needed

- ADIS544 Datasheet
- ADIS544 (EZ) PDR Register Map User's Guide
- ADIS544 User Guide

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GENERAL DESCRIPTION

The ADIS544 evaluation board is a compact, easy-to-use platform for evaluating all features of the ADIS544 iSensor dual digital IMU, and it includes the ADIS544 ALIO module, which provides a convenient, multi-purpose test connector terminal. The ADIS544 ALIO module includes 10 MHz TCXO and PLL and integrates the high performance synchronization capabilities such as SYNC, DIO4 (Version 2, Synchronous Direction, CTN Function), and DIO3 (Version 2, Synchronous Direction, DRDY Function) to support a wide range of system timing requirements.

The ADIS544 can output up to 3 different system clocks, plus two single-ended clock drivers, to help with system timing requirements. The ADIS544 ALIO module has 3 configurable clock inputs to allow the user to evaluate the ADIS544 under timing scenarios directly by a system clock source. The ADIS544 ALIO module has 3 configurable clock inputs to allow the user to evaluate the ADIS544 under timing scenarios directly by a system clock source. Use the user guide to sequence the test equipment that has been provided by ADI.

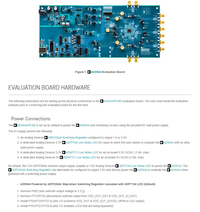

Figure 1. ADIS544 Evaluation Board

EVALUATION BOARD HARDWARE

The following instructions are for setting up the physical connections for the ADIS544EVALZ evaluation board. The user must install the evaluation software prior to connecting the evaluation board for the first time.

Power Connections

The ADIS544EVALZ is set up by default to power the ADIS544 and initializing circuitry using the provided 5 V wall supply.

There are 3 supply options for this board:

- On-board, 5 V wall supply (ADIS544 Operating Regulator configured for output 3.3 V, 5 V)
- On-board, 5 V wall supply (ADIS544 Operating Regulator configured for output 3.3 V, 5 V)
- A dedicated analog Channel 3.3 V (ADIS544 Operating Regulator configured for output 3.3 V, 5 V)
- A dedicated digital Channel 3.3 V (ADIS544 Operating Regulator configured for output 3.3 V, 5 V)

To operate the ADIS544 evaluation board, follow the steps below:

1. Connect the 5 V wall supply to the main power connector labeled P100.
2. Connect the USB cable to the evaluation board and the computer. The red LED labeled DS100 to the USB connector should illuminate.
3. Connect the USB cable to the computer.
4. If the Found New Hardware Wizard window automatically appears, select Install the software automatically and click Next.
5. The Found New Hardware Wizard window automatically appears. Follow the instructions to complete the installation.

Refer to the Evaluation Board Software section for details on running the ADIS544 evaluation board software.

Reference Inputs

The ADIS544 evaluation board has three reference inputs sources, the VREF_EXT, DIO1, and DIO2 pins. The VREF_EXT pin is connected to the SMA connector and can be used as a typical ground-ref and 4.5 V to 5 V differential inputs.

In contrast, VREF_TERM (Connector J202 and J202, respectively) are configured for single-ended CMOS inputs by default. Each reference input has a 100 Ω termination resistor to ground, which is useful for 50 Ω or 75 Ω signal sources. The VREF_TERM pin is connected to the SMA connector and can be used as a typical ground-ref and 4.5 V to 5 V differential inputs. The VREF_TERM pin is connected to the SMA connector and can be used as a typical ground-ref and 4.5 V to 5 V differential inputs. The VREF_TERM pin is connected to the SMA connector and can be used as a typical ground-ref and 4.5 V to 5 V differential inputs.

System Clock Inputs

By default, the ADIS544 system clock input is configured to the on-board 10.752 kHz TCXO oscillator. For applications that require either a TCXO or an external clock, the ADIS544 ALIO module has 3 configurable clock inputs.

Table 1. System Clock Input Configuration

SYSCLK Input	Jumper P902	Jumper P903
Crystal	Center and Right Pins	Center and Right Pins
TCXO	Center and Left Pins	Center and Left Pins
EXTCLK	Center and Top Pins	Center and Bottom Pins

LINK DMS Connector and Bottom Pins, Center and Top Pins

PC Connections

1. Install all required software, uninstall prior versions of the software before installation systems.
2. Connect the 5 V wall supply to the main power connector labeled P100.
3. Connect the USB cable to the evaluation board and the computer. The red LED labeled DS100 to the USB connector should illuminate.
4. If the Found New Hardware Wizard window automatically appears, select Install the software automatically and click Next.
5. The Found New Hardware Wizard window automatically appears. Follow the instructions to complete the installation.

Refer to the Evaluation Board Software section for details on running the ADIS544 evaluation board software.

Serial Port Configuration Pins

The ADIS544 serial port configuration is determined by the state of the DIO1 and DIO2 pins, which are latched at power-on. The ADIS544 EVALZ has a 100 kΩ pull-down resistor on each of these pins, which configures the serial port for 32-bit SPI mode, by default. To select one of the other modes, remove the jumper on the appropriate pin and connect it to the VDD pin. Refer to the ADIS544 data sheet for more information.

Table 2. Serial Port configuration

Serial Protocol	Alarm Address	Jumper P905, Top/Middle/Bottom Pins	Jumper P904	Jumper P511
SPI	N/A	Top: 4.5 / 5.2	DIO1	DIO2
SPI	N/A	Top: 4.5 / 5.2	DIO1	DIO2
I²C	0x68	Top: 0.6 / 0.5	SCL	SDA
I²C	0x69	Top: 0.6 / 0.5	SCL	SDA
I²C	0x6A	Top: 0.6 / 0.5	SCL	SDA
I²C	0x6B	Top: 0.6 / 0.5	SCL	SDA

EEPROM Loading at Power-up

The ADIS544 does get a frequency of the bit set at reset or power-up to enable/disable EEPROM reading. To read the external EEPROM, place a jumper across the center two pins and the top two pins of the jumper block P904. The corresponding to the Flash On Jumper block P904.

EVALUATION BOARD SOFTWARE

The ADIS544 evaluation software allows the user to connect to the host functionality of the ADIS544 through SPI or I²C communication with the evaluation board. The ADIS544 evaluation software is implemented as a component plug-in to the Windows Control Evaluation (ACE) software platform. After installing ACE, which allows the evaluation of a number of multiple evaluation systems from across ADI's product portfolio and is designed to evaluate the user interface, the ADIS544 ALIO module plug-in. The ACE software platform, which