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The [Previously approved version](#) (22 Jan 2018 07:34) is available. 

EV-GEAR-EXPANDER1Z

Introduction

EV-GEAR-EXPANDER1Z is a “Gear” (expansion add-on board) for MCU Cogs (EV-COG-AD3029LZ & EV-COG-AD4050LZ). This gear is designed for quick prototyping and bread boarding.

- The board provides easy access to all the MCU GPIO signals by bringing the signals on a header array.
- It enables
 - PMOD modules interface Via SPI and I2C
 - Quick SensorStrobe application prototyping through a dedicated connector
 - SD Card interface for data logging.
 - Additional Gears connectivity
 - “Arduino uno” compatible shields

This user guide describes the connectors details and jumper settings.

Table of Contents

- ♦ [EV-GEAR-EXPANDER1Z](#)
 - ♦ [Introduction](#)
 - ♦ [Hardware details](#)
 - ♦ [Board image](#)
 - ♦ [Primary-side](#)
 - ♦ [Secondary-side](#)
 - ♦ [Power option](#)
 - ♦ [COG connectors](#)
 - ♦ [Gear connectors](#)
 - ♦ [Arduino Uno headers](#)
 - ♦ [PMOD interfaces](#)
 - ♦ [Debug headers](#)
 - ♦ [Design Files](#)

Hardware details

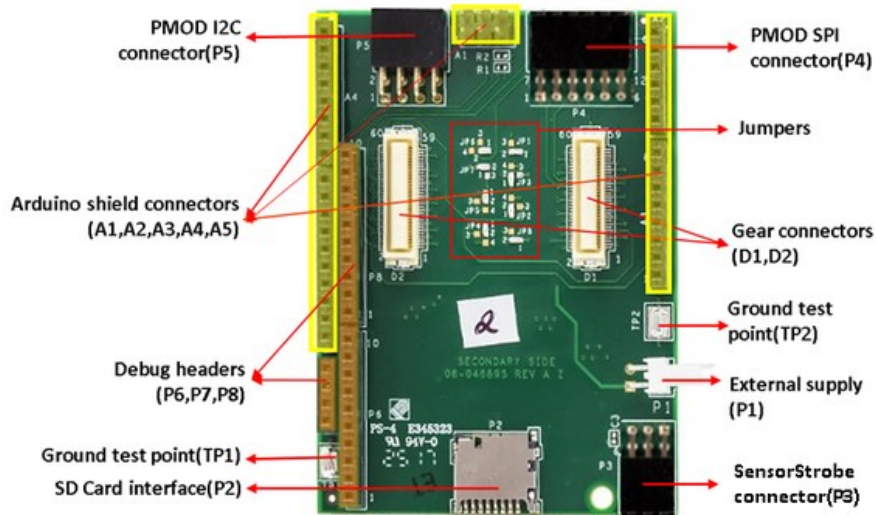
Board image

Primary-side



COG connectors
(C1,C2)

Secondary-side



The board consists of

- COG connectors (C1, C2)
- Gear connectors (D1, D2)
- Arduino Uno headers (A1, A2, A3, A4, A5)
- PMOD interfaces (P3, P4, P5)
- Debug headers (P6, P7, P8)
- Jumpers and test points

Power option

The EV-GEAR-EXPANDER1Z board is powered by means of VDD supply from MCU cog through connector C1. The VDD supply is shared between various connectors for PMOD interfaces, SD card reader, Arduino shields and gears. Alternately MCU cog can be powered from EV-GEAR-EXPANDER1Z.

- Power supply header P1 can be used to supply 5V
- Pin 10 of header P8 can be used to supply 3V

COG connectors

The COG connectors C1 and C2 interface the EV-GEAR-EXPANDER1Z board with MCU Cog. The connector carries all the GPIO signals from the MCU Cog board. The pinout details are given in the [expander connector section in EV-COG-AD3029LZ wiki](#).



If any application is not working on MCU COG connected to a EV-GEAR-EXPANDER1Z board, check for the connectivity from MCU COG to EV-GEAR-EXPANDER1Z. If it is found that there is no connectivity, the one of possible reasons could be, accumulation of dust on the Expander connectors C1 and C2. To resolve this, clean the connectors with isopropyl alcohol or any solvent. Improper connector mating can also result in the loss of connectivity between MCU COG and EV-GEAR-EXPANDER1Z, make sure that shunts installed on COG are not obstructing the connector mating.

Gear connectors

The connectors D1 and D2 can be used to connect a Gear. Gear is an add-on application board which can be a custom build to serve the required application.



The gear must have the connector ([DF17\(4.0\)-60DP-0.5V\(57\)](#)) to interface with D1 and D2 connectors.

The pinout details for D1 and D2 are same as that of COG connectors (C1, C2 [expander connector section in EV-COG-AD3029LZ wiki](#)).

Arduino Uno headers

The headers A1, A2, A3, A4 and A5 support the shields that are Arduino Uno compatible. The following table captures the signals connected to the headers

Connector name	Connector reference	Pin_number	Signal_name
Arduino	A1	1	SPI0_MISO
		2	FT_EXT_VDD_OUT
		3	SPI0_CLK
		4	SPI0_MOSI
		5	TT_EXT_RESET_IN
		6	GND
	A2	1	ADC0
		2	EXT_ADC1
		3	EXT_ADC2
		4	ADC3
		5	SPI2_CS3
		6	EXT_GPIO42
	A3	1	NC
		2	FT_EXT_VDD_OUT
		3	TT_EXT_RESET_IN
		4	FT_EXT_VDD_OUT
		5	FT_EXT_SUPPLY_OUT
		6	GND
		7	GND
		8	N.C
	A4	1	P8_12
		2	GPIO27
		3	P33_43
		4	EXT_SPI2_CS1
		5	EXT_INT_WAKE2
		6	INT_WAKE0
		7	EXT_UART0_RXD
		8	EXT_UART0_TXD
	A5	1	I2C0_SCL
		2	I2C0_SDA
		3	VREF_ADC
		4	GND
		5	SPI0_CLK
		6	SPI0_MISO
		7	SPI0_MOSI
		8	SPI0_CS2
		9	EXT_GPIO30
		10	GPIO28

PMOD interfaces

The EV-GEAR-EXPANDER1Z board offers connectors with PMOD SPI, PMOD I2C and PMOD IO/SensorStrobe interfaces. Any PMOD peripheral module with PMOD SPI or PMOD I2C interface can be directly plugged into these connectors. The host MCU communicates to the modules by means of SPI or I2C. The Sensorstrobe connector is a custom connector which provides access to ADuCM3029/ADuCM4050 SensorStrobe signals and few other GPIOs. The pinout details of the PMOD connectors are given below.

Connector name	Connector reference	Pin_number	Signal_name
SensorStrobe connector	P3	1	SS_IO_01
		2	SS_IO_02
		3	SS_IO_03
		4	SS_IO_04
		5	GND
		6	FT_EXT_VDD_OUT
PMOD SPI	P4	1	SPI1_CS0
		2	SPI1_MOSI
		3	SPI1_MISO
		4	SPI1_CLK
		5	GND
		6	FT_EXT_VDD_OUT
		7	INT_WAKE0
		8	PMOD_8
		9	GPIO14
		10	ADXL_ANALOG
		11	GND
		12	FT_EXT_VDD_OUT
PMOD I2C	P5	1	I2C0_SCL
		2	I2C0_SCL
		3	I2C0_SDA
		4	I2C0_SDA
		5	GND
		6	GND
		7	FT_EXT_VDD_OUT
		8	FT_EXT_VDD_OUT

Debug headers

The Debug headers P6, P7 and P8 can be used to probe certain MCU GPIOs. The headers consist of male and female pins. The following table captures the pinout.

Connector name	Connector reference	Pin_number	Signal_name
Debug header 1	P6	1	SPI2_RDY
		2	SPI2_CLK
		3	SPI2_MOSI
		4	SPI2_MISO

Connector name	Connector reference	Pin_number	Signal_name
		5	SPI2_CS0
		6	EXT_INT_WAKE1
		7	GPIO14
		8	EXT_GPIO34
		9	GPIO29
		10	GPIO41
Debug header 2	P7	1	ADF_GPIO0
		2	ADF_GPIO1
		3	ADF_GPIO2
		4	RF_RTC_OPC1
Debug header 3	P8	1	EXT_SPI1_CS3
		2	SPI1_CS0
		3	SPI1_MISO
		4	SPI1_MOSI
		5	SPI1_CLK
		6	EXT_RTC1_SS1
		7	GPIO12
		8	GPIO32
		9	GPIO31
		10	TT_EXT_VDD_IN

Design Files

EV-GEAR-EXPANDER1Z Rev B Design and Integration Files



-  [Schematics](#) (PDF)
-  [Bill of materials](#) (zip)
-  [Fabrication Files](#) (Zip)
-  [Assembly Files](#) (Zip)

End Document

[Back](#)

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