

Inductive Position Sensor Pro Sensor Kit



MICROCHIP

Introduction

The LX3302AQPW and LX3301AQPW ICs are a low cost, high-accuracy and superior magnetic noise immune position sensor IC. The sensor system consists of the inductive position sensor ICs, its printed circuit board sensor, and the target. A target Metal is attached to the moving mechanical housing, which provides position relative to the fixed position of sensor PCB.

The inductive PCBs are constructed using printed circuit board material

The sensor assembly is connected to the USB IPCE Programmer Interface through a 4-wires cable carrying +5V, GND, IO2 (DOUT) and IO3 (AOUT). The IPCE Programmer allows programming of LX3302AQPW and LX3301AQPW internal configuration EEPROM.

1. Features

1.1. Pro Kit Contents

The Evaluation Kit contains the following items:

- Inductive position sensor PCB with target assembly
- IPCE interface programmer
- 4pin to 10pin Cable between LXM9518 and Sensor PCB
- USB power Cable
- The IPCE Software downloaded from Microchip Technology [Inductive Position Sensor Landing Page](#)

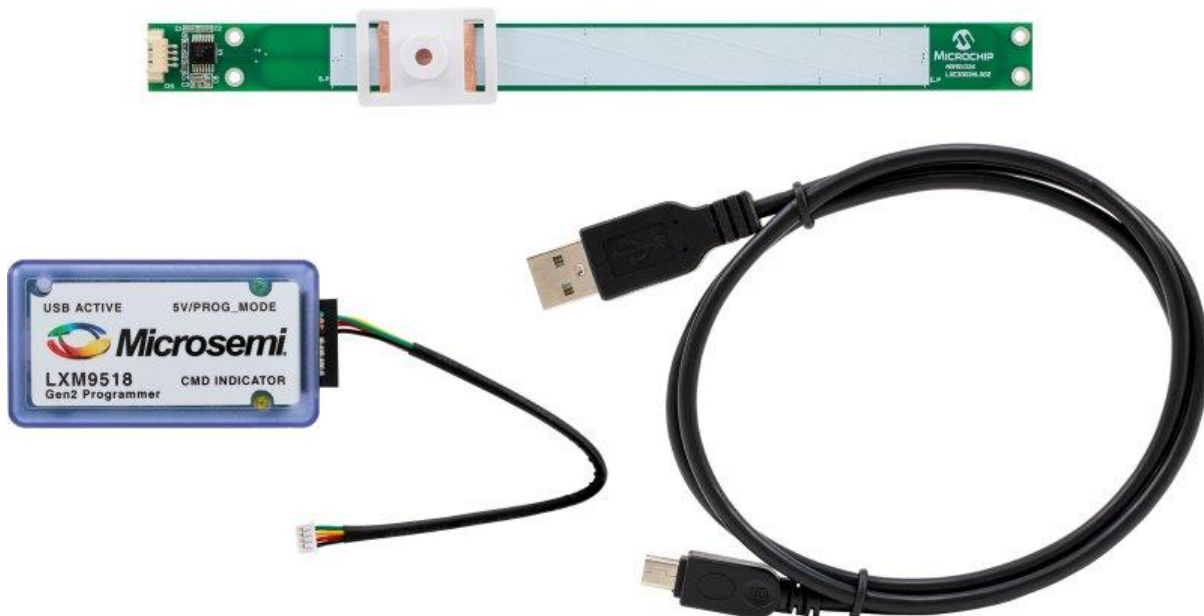


Figure 1 - LX3302A Pro Sensor Kit Example ([LXK3302AL002](#))

2. System Operation

The evaluation kit has been factory calibrated and is ready to use. The default operation requires a +5VDC power source which can be supplied either by an external DC power supply or the ICPE programmer connected to PC via USB.

The Inductive Sensor kit constitutes a main sensor board and a movable target PCB. The main sensor board contains two oscillator coils (OSC1 and OSC2) and two pickup coils (CL1 and CL2). The IC energizes the two oscillator coils. The position of the target varies the reception of the two pickup coils relative to each other. The IC demodulates the two received signals and generates an output signal representative of the relative difference between the CL1 and CL2 signals as shown Fig 2.

The values of the two OSC1 and OSC2 capacitors vary depending on the characteristics of the OSC1 and OSC2 printed circuit board layout pattern. The combination L/C impedance of the printed circuit board layout is matched to the LX3302AQPW's and LX3301AQPW oscillation requirement. Refer to the LX3302AQPW and LX3301AQPW Data Sheets for more design parameters.

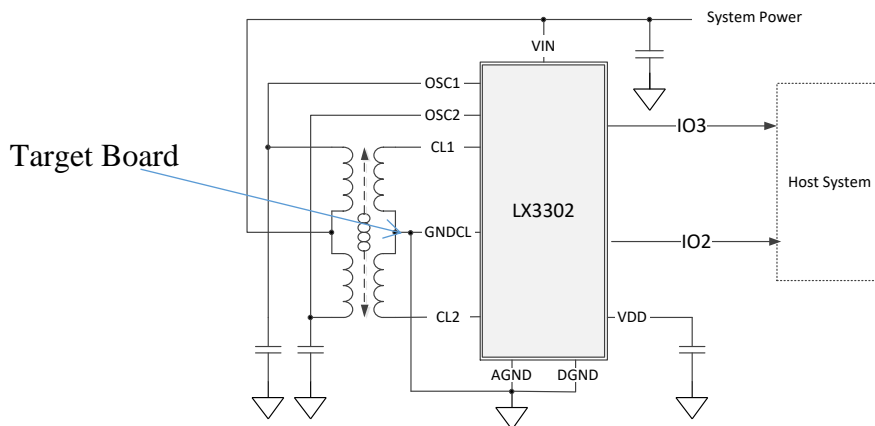


Figure 2 - Inductive Sensor Operation Principle

3. 4pin to 10pin Connector between Sensor Board and Programmer

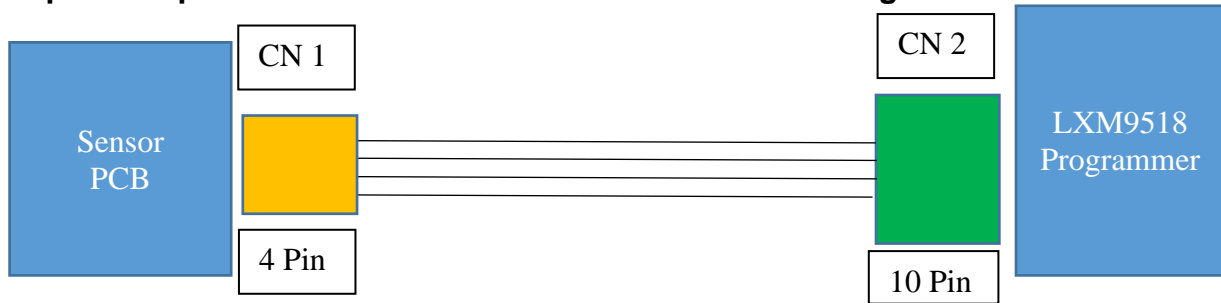


Figure 3 - 4pin to 10pin connector

The following figure shows the required external system equipment and their respective connections to the LX3302A evaluation board. The sensor assembly comes with a 4pin (CN1) to 10pin (CN2) connector to connect the sensor to the IPCE Programmer. The pin out of this connector is shown below.

Pin#	Pin Name	Functional Description
1	GND	Ground
2	VIN	+5V Supply/Internal EEPROM Programming, Refer to datasheet for details
3	IO3 (AOUT)	LX3302AQPW IO3 output could be programmed to analog/PWM/SENT/PSI5/TD output. Refer to the LX3302AQPW datasheet. (LX3301AQPW DOUT output is the Analog/PWM/TD) Refer to the LX3301AQPW datasheet
4	IO2 (DOUT)	LX3302AQPW IO2 output could be programmed to PWM/SENT. (LX3301AQPW DOUT output is the PWM/TD)

Table 1 . CN1 Pinout Connector (Molex Part number: 151340400)

Pin#	Pin Name	Functional Description
1	IO2 (DOUT)	LX3302AQPW IO2 output could be programmed to PWM/SENT. (LX3301AQPW DOUT output is the PWM/TD)
2	IO3 (AOUT)	LX3302AQPW IO3 output could be programmed to analog/PWM/SENT/PSI5/TD output. Refer to the LX3302AQPW datasheet. (LX3301AQPW DOUT output is the Analog/PWM/TD) Refer to the LX3301AQPW datasheet
3	Vin	+5V Supply/Internal EEPROM Programming, Refer to datasheet for details
4	GND	Ground
5	NU	
6	NU	
7	NU	
8	NU	
9	NU	
10	NU	

Table 2. CN2 Connector Pinout (3M M1DXA-1036J)

4. Inductive Sensor Board Typical Characteristics

The following plot displays an example of linearity achievable with the sensor with a SENT output. Other output formats will have the same accuracy.

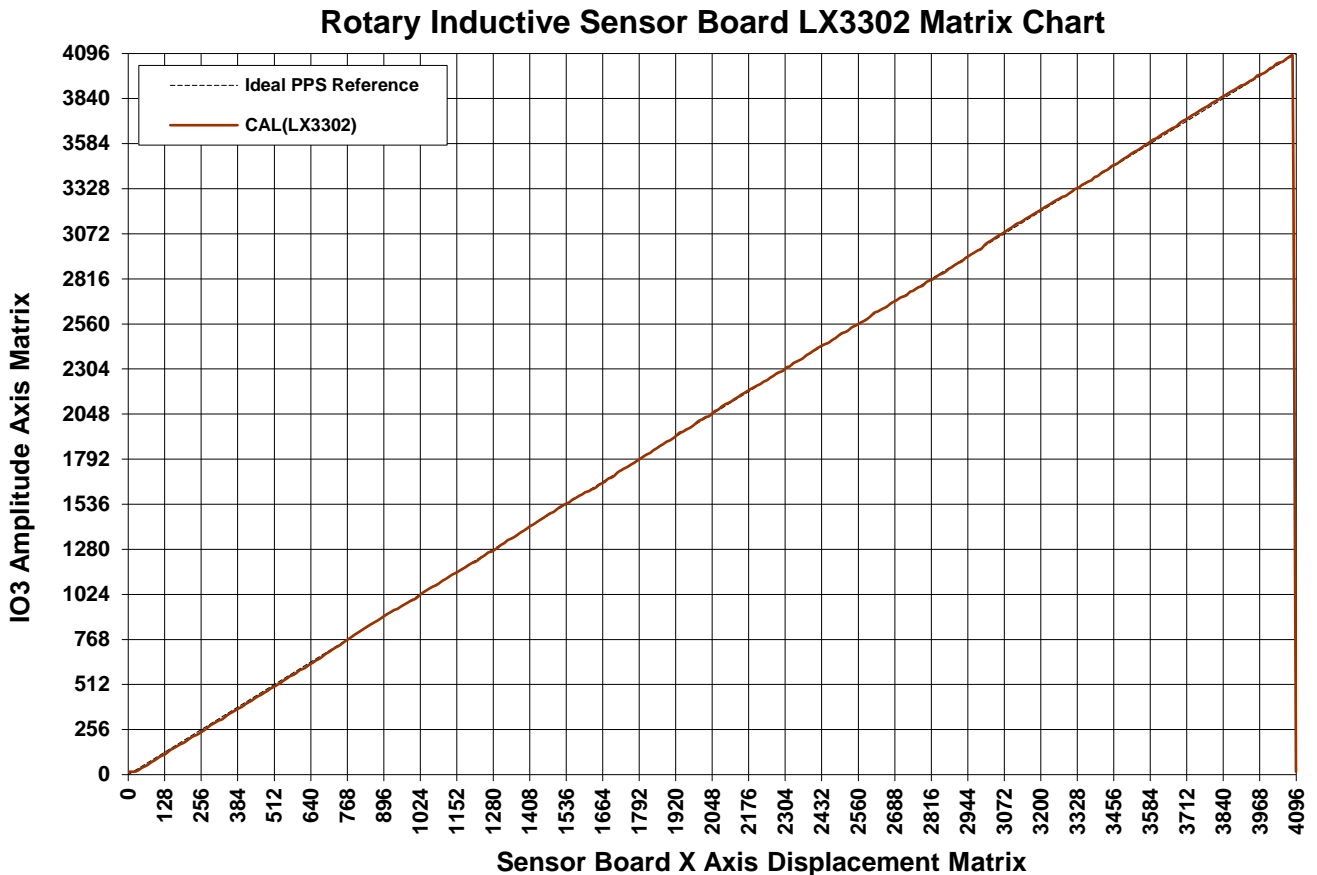


Figure 4 – An Example of typical Inductive Sensor Board Linearity (Calibrated)

5. Configuration EEPROM

The measurement IC contains an internal EEPROM for storing calibration and configuration parameters. The calibration parameters enable the production sensor assembly to be factory calibrated guaranteeing consistent unit-to-unit performance.

6. Kit EEPROM Programming IPCE

The sensor kit includes an Integrated Programming and Calibration Environment (IPCE) to facilitate system calibration and configuration. The Integrated Programming Environment contains an EEPROM Programming tool and data measuring system.

6.1 IPCE Installation and startup

- 1) After downloading software from [web landing page](#), run the install program.
- 2) When you are connected, dongle status will report that the port is open and it detects the EVB
- 3) The voltages or digital signals from each output will be displayed in the live update section of the IPCE tool