Gear Sensor Demonstration Board User's Guide

Introduction

TMR4005 (old Version is MMG445DG) is a contactless magnetic gear sensor produced by Multi-Dimension Technology (hereinafter to be referred as "MDT") for tooth detection.TMR-based gear sensor can not only achieve measurements of linear displacement,linear velocity angular displacement and angular velocity,but also recognize the rotation and motion direction.TMR-based gear sensor has high sensitivity and can operate at a large air gap, and also is good at small pitch tooth detection.

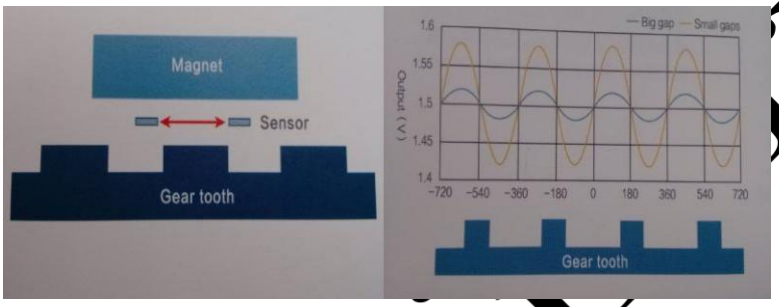

Figure 1: Operational Principl

The Gear Demonstration Board is a complete gear sensor system with microcontroller, graphic LCD display and incremental A/B output indication LED which demonstrates the capabilities of TMR4005 (MMG445DG) devices. The absolute phase measurement provides instant indication of the gear's angular position with a resolution of 1.4 ° 256 positions per revolution and the absolute value of the teeth. This user's guide describes how to use Gear Sensor Demonstration Board. Relative documentations of data sheets, application notes and reference manuals can be downloaded from MDT's website.

Gear Sensor Demonstration Board

The Gear Sensor Demonstration Board comes with the following:

- Gear Sensor Demonstration Mother Board
- Sample Device Daughter Board

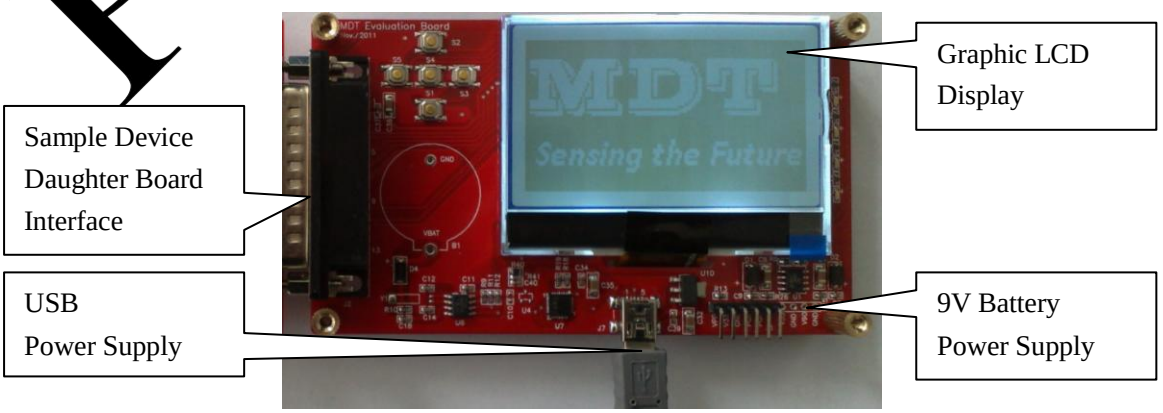

Figure 2: Gear Sensor Demonstration Mother Board

Figure 3: Sample Device Daughter Board

The Gear Sensor Demonstration Board can be USB powered or externally supplied with a 9V battery.

- Supplied by an external 9V battery (Figure 2)

Connect a 9V battery to the battery connector on the bottom right side of the mother board. No other connections are required.

- Supplied by an USB port (Figure 2)

Connect the mother board to a PC using a USB cable (included in shipment). It is supplied by the 5V supply of the USB port. No other connections are required.

Getting Started with the Gear Sensor Demonstration Board

The Gear Sensor Demonstration Board has the following features:

- Absolute gear teeth output on LCD
- Absolute gear phase output on LCD
- Incremental A/B outputs on LED

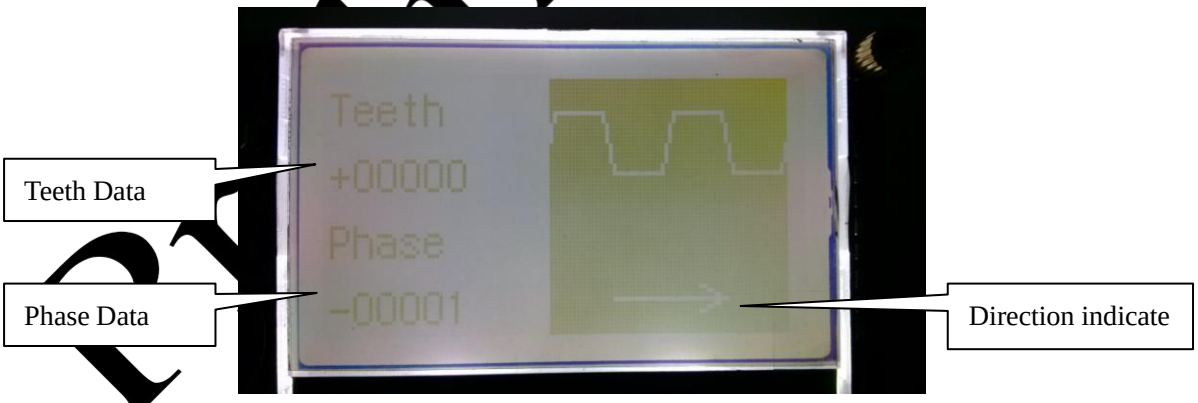

Figure 4: Gear Sensor Demonstration Screen

The graphic LCD display shows the real-time absolute phase measurement of the gear's angular position with a resolution of 1.4 ≏ 256 positions per revolution and the absolute value of the teeth. And a graphic arrows indicates the direction of rotation correspondingly.

The incremental A/B outputs use LED indicators (Figure 3). A timing figure of incremental outputs is listed below.

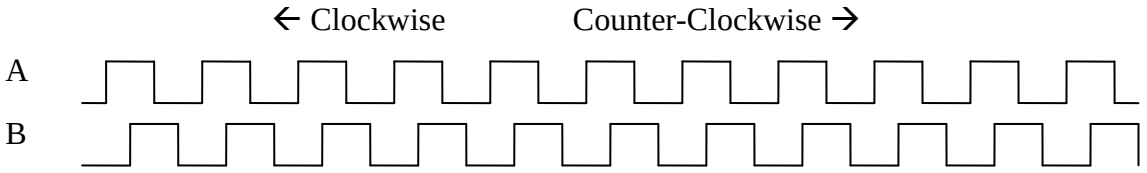

Figure 5: Incremental Output Timing

The detailed operating instructions are listed here. It must be implemented step by step.

1. Connect Sample Device Daughter Board to Gear Sensor Demonstration Board (Figure 2 & 3).
2. Power the board with 9V battery or USB, a MDT's logo shows as background (Figure 2). After 4 seconds, the display automatically shifts to gear screen (Figure 4).
3. When user is turning the knob, the display data changes accordingly.

Revision History

Revision	Date	Description	
V1.0	Nov 2, 2012	First version	
V2.0	Nov 21,2012	Second version	
V2.1	Mar 5, 2015	Change MMG445D to TMR4005 by New naming rules	

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