1. Connect both output channels to an oscilloscope or a counter/timer capable of measuring phase angle. If your oscilloscope does not support direct phase angle measurements, you can calculate the phase angle manually using the equation: Phase Angle = ((Leading Edge A – Leading Edge B) / Period) * 360°

2. Set the air gap properly during the sensor installation. Rotate the sensor until the alignment mark on the sensor housing is aligned as shown in the image.

3. Rotate the target gear in the counterclockwise direction and determine the initial phase angle. If the phase angle is less than 90°, slowly rotate the sensor counterclockwise until phase shift is 90°. If the phase angle is greater than 90°, slowly rotate the sensor clockwise until the phase shift is 90°.

4. Rotate the target gear in the clockwise direction and measure the phase angle. Chances are that it is not 90° due to mismatch between the duty cycles of the two output channels. For every 1% mismatch in duty cycle between the two output channels, there is a 3.6° error in the phase shift balance. To properly balance the phase shift, determine half the phase shift error and rotate the sensor accordingly. For example, if the initial counterclockwise phase shift is 90° and the clockwise phase shift is 90° – 10°, rotate the sensor until the clockwise phase shift is 95°. Rotate the target gear in the counter clockwise direction and confirm that the counterclockwise phase shift is 85°. Repeat this step until the phase shift in both directions is properly balanced.

5. Setting the phase shift can be difficult due to the sensitivity when rotating the sensor. For a 12 pitch gear, rotating the sensor 1° will change the phase shift approximately 3.2°.

6. Over rotating the sensor will cause the polarity of the phase shift to reverse. This may be preferred in an application where a positive phase shift is required for clockwise gear rotation. The setup procedure is the same as above except the polarity of the phase shift is reversed.

7. Note: This procedure is only valid for HD series sensors that can be manually positioned. Please contact motion sensors for applications that require custom alignment for sensors with fixed mounting.