Project Name: Laser Delivery System

Researcher(s)/Developer(s): Dr. Rardchawadee Silapunt , Mr. Roongrote Wangkiet, Mr. Wuttichai Visarnkuna, Mr. Komkrit Thipgesorn, Mr. Nattapong Kaewlek, Mr. Thanniti Khunnithiwarawat, and Mr. Pongsakorn Polchankajorn

Introduction

The precise alignment of the HDD read/write heads, called sliders, on a HSA is one of the most critical factors in HDD assembly process. These components are illustrated by Figure 1. Despite of the fact that, if there is a slight deviation in their orientations, this will greatly lead to the malfunction of HDD as a whole. This is because nowadays most slider moves with the precision in sub nanometer. Thus, the inspection of slider orientation on HSA plays a vital role in HDD assembly process. If it can be detected beforehand, the failure part can be reduced by correcting the orientation to the right position.

Problem Statement

Currently, the laser technology is being used in a company to measure and adjust the slider orientation. However, the current system has limited capability. The measurement and adjustment process is performed separately on a different machine. Each of which can work with just HGA. This means it can only measure or adjust one slider at a time. In the case of the measurement process, it is also not fast enough to be implemented in the final assembly level as it has several mechanical movements, leading to high inertia of the system. Applied with HSA, it will be further contributed to accumulation of slow measurement time. In addition, due to the adjustment is done on a different machine. The orientation of a slider cannot be corrected immediately even the measurement system can determine how much of its deviation. In order for to overcome this limitation, a new methodology must be developed. This will entirely increase the production rate and reduce the failed product of HDD assembly.

Research/Development Approach

Based on automation approach, laser, optics, scan mirror, and machine vision are integrated to form a prototype machine capable of measuring and adjusting slider orientation consequently.

Expectation

Prototype machine that demonstrates the potential of usage in the HDD assemble line.