

Team 22 – Automated High Volume Bearing Bore Gage

# Project Plan

Restated

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## Problem statement

The objective of this project is to improve the out-of-date bearing bore gage system used by Koyo Bearings. This improvement must advance the user interface while maintaining the quality of the measuring device and the sampling rate. The improvement should also allow for the communication of each gage to a central terminal. This will allow for multiple systems to be monitored from a single device.

## Project Objectives

The main goal for this project is to retrofit the bearing gauge testing console with a new computer, operating system, and display. In addition, the machine should later be able to connect to the network at the Koyo plant. Projected date of completion is May 2014.

### **The plan for the Spring Semester:**

1. Receive ordered electronic components.
2. Disassemble the current electronic system.
3. Create PLC testing platform.
4. Code and test electrical components.
5. Integrate electrical components together.
6. Final testing and debugging.
7. Calibrate the bearing bore gage.
8. Present completed bearing bore gage.

## Product Specifications

### Design Specifications

The design chosen must be able to run off of a 120V power supply; this is the current power supply being implemented at Koyo Bearing. Air transducers will be used to measure each boring. The device must be able to operate at a rate of one bearing per six seconds; this includes measuring the bore and determining whether or not it passes the allowable tolerances.

### Performance Specifications

The design must incorporate a large touch screen display/input. It must also be able to communicate with the network at Koyo Bearing's facility. The device must maintain 100% accuracy on tolerance acceptance and maintain the failure alert system; this means that three consecutive failures will alert the staff.

## Project Constraints

There are many constraints that must be taken into account starting this project. Money will be a large constraint. It will determine what technology we can actually use in the redesign of this bore gauge. As of right now, the budget is \$2,000.00 and Koyo Bearing has requested that we do all purchasing through their company. Another constraint to this project is time. Time must

be used efficiently to ensure that the final product is assembled and working properly. For integration to run smoothly, the testing of each components code should be done by March. This will leave two months for full integration, debugging, and calibrating.

## Project Updates

### Sponsor Corrections

Throughout the first semester, the sponsor has been pleased with the work and design produced by team 22. The only corrections made thus far are on the specific components to be purchased; Koyo Bearing already possessed a CPU and recommended Allen Bradley for its high quality PLCs. Since the end of the fall semester, no new corrections have been made.

### New Developments

The creation of a PLC testing platform has begun. It is near completion and is need of only the PLC. Communication had broken down with Koyo Bearing during the break resulting in the delayed ordering of parts.

### Procurement

The aforementioned communication breakdown slowed down the process for procuring parts. All purchasing is being done through Koyo Bearings. They have informed us that the parts are being ordered. During this time, the current electrical system will be disassembled and preparations will begin for coding and assembly.

