In-Process Gaging for Cylindrical Grinding

David Longanbach
Advisor: Dr. Tom Kurfess
Gage Interface Schematic

- Machine Controller
- Machine Interface
- Set Point Controller
- Data Acquisition
- Visual Basic & Component Works
- Upper LVDT
- LVDT Signal Conditioning
- Anti-Aliasing Filters
- Lower LVDT
- Motor Controller
- DC Motor
- LVDT Signal Conditioning
- Anti-Aliasing Filters
- Data Acquisition
- Visual Basic & Component Works
Gage Interface Diagram

- Marposs Gage
- Power Supply
- Gage Connection
- Anti-Aliasing Filters
- Machine Interface
- Power Distribution
- LVDT Signal Conditioner
- Set Point Controller
- Gage Connection
Objectives

- In-process waviness monitoring
- Hardware implementation
- Software implementation
- Validation on bore grinding machine
Hardware Implementation

• Sealed enclosure
• Industry standard signal conditioning
• Custom circuits required
• Stand alone operation
Software Implementation

- Visual Basic and Component Works
- GUI interface
- Required for machine setup
- Not required for machine operation
Single Process Validation Results
Beginning of Cycle Analysis

Frequency Spectrum, 1539 RPM
Middle of Cycle Analysis

Frequency Spectrum, 1539 RPM
End of Cycle Analysis

Frequency Spectrum, 1539 RPM
Additional Work

• Improve software and GUI
• Improve set point controller
• More testing on more machines