



Project Number: 16315

SPX DATA ACQUISITION

Thomas Klaben
Electrical Engineering

Luke Kranz
Electrical Engineering

David Haller
Mechanical Engineering

Adam Johnson
Mechanical Engineering

John Dong
Mechanical Engineering

Abstract

Introduction

-project overview

Design Process

-applying customer and engineering requirements to a design
-journey through design revisions

Figure 1. Conceptual System Setup

Telemetry System

-describe how telemetry system works (and why it is better than slip ring)
-compare and contrast competitors
-show that all specs are met by the design choice (battery life, etc.)
-calibration procedure

Figure 2. Telemetry System Choice 1

Figure 3. Telemetry System Choice 2

Figure 4. Telemetry System Choice 3

Strain Gauges

-describe how strain gauge works
-compare and contrast competitors
-show that all specs are met by the design choice
-mounting procedure
-calibration procedure

Figure 5. Strain Gauge Choice 1

Figure 6. Strain Gauge Choice 2

Figure 7. Strain Gauge Choice 3

Transmitter Case

- outline design process
- describe need for transmitter case

Figure 8. Case Initial Design

Figure 9. 3-D Printed Case

Wiring

- telemetry system wiring
- transmitter case wiring
- strain gauge wiring
- wiring for different shaft lengths

Waterproofing

- transmitter case sealing procedures
- wire waterproofing requirements and solution
- strain gauge waterproofing requirements and solution

Validation

- telemetry subsystem (Test A)
- cantilever beam test
- case waterproof test (Test C)
- gauge placement and waterproofing (Tests B and D)

Final Design

- final decision on gauge
- final decision on telemetry system
- assembly process
- testing process

Results and Discussion

Conclusions and Recommendations

References

- [1] Placeholder.

Acknowledgements