2014

Industrial Monitoring System Report

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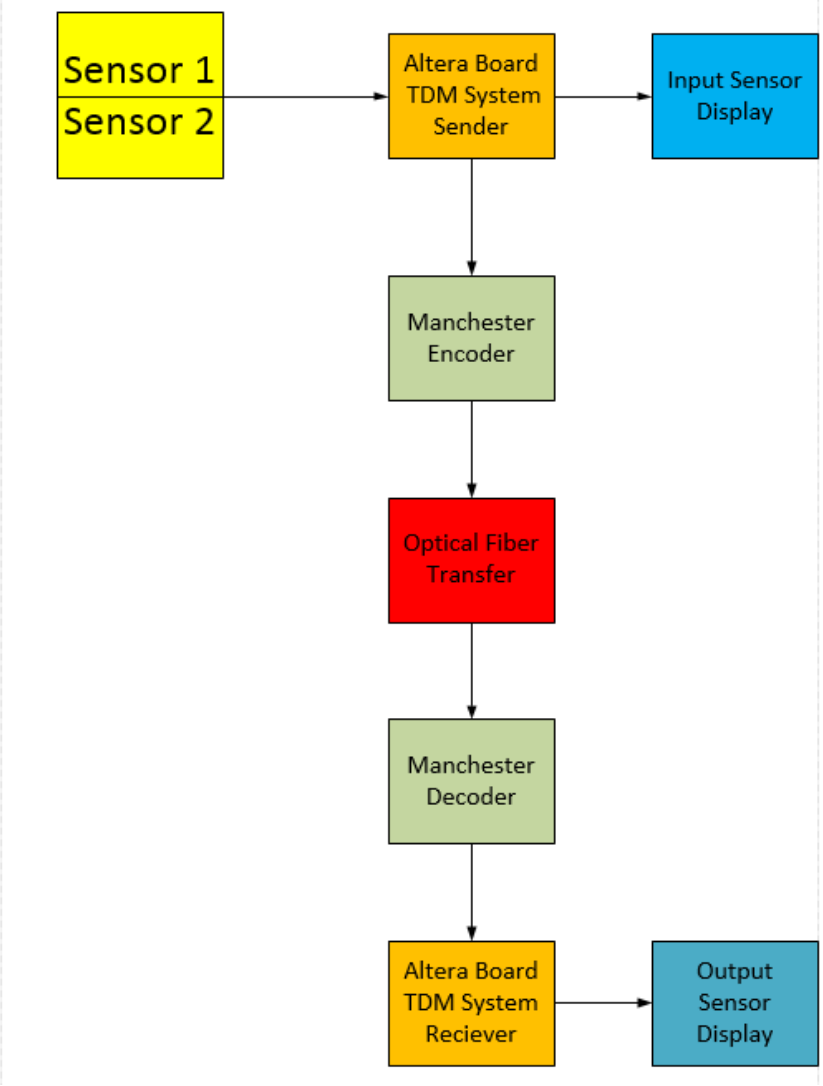
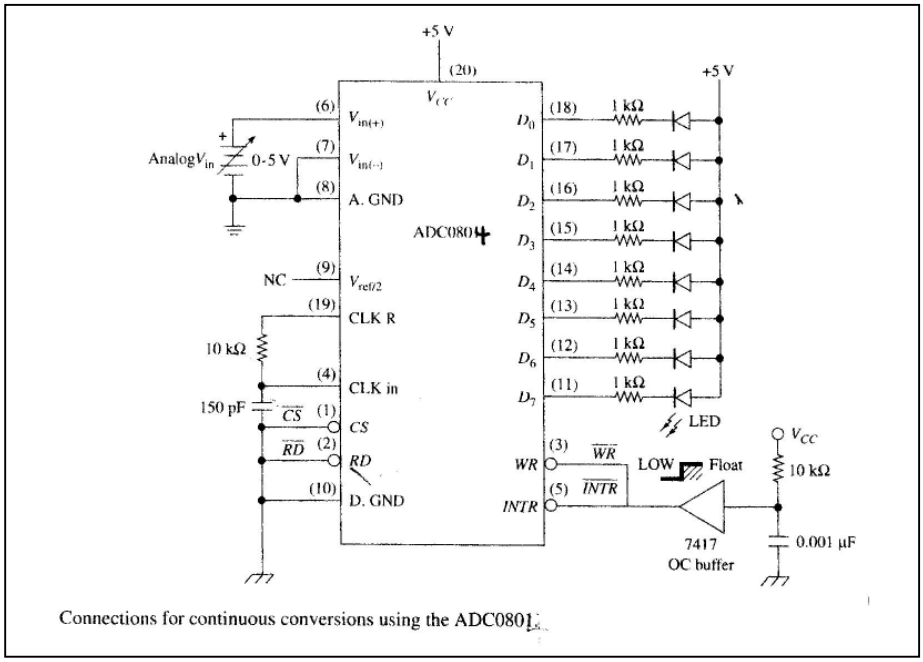
Contents

System Layout

Block Diagram of System



Sensor Schematic



Connections for continuous conversions using the ADC0801.

Altera Board TDM Sender System

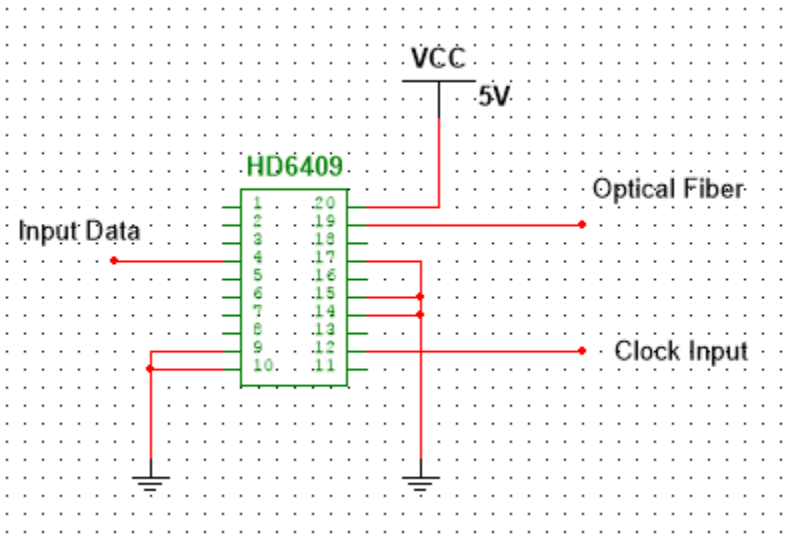
Framing Layout

FF	FF	Sensor 1 Data	Inverted Sensor 1 Data	AA	Sensor 2 Data	Inverted Sensor 2 Data	AA

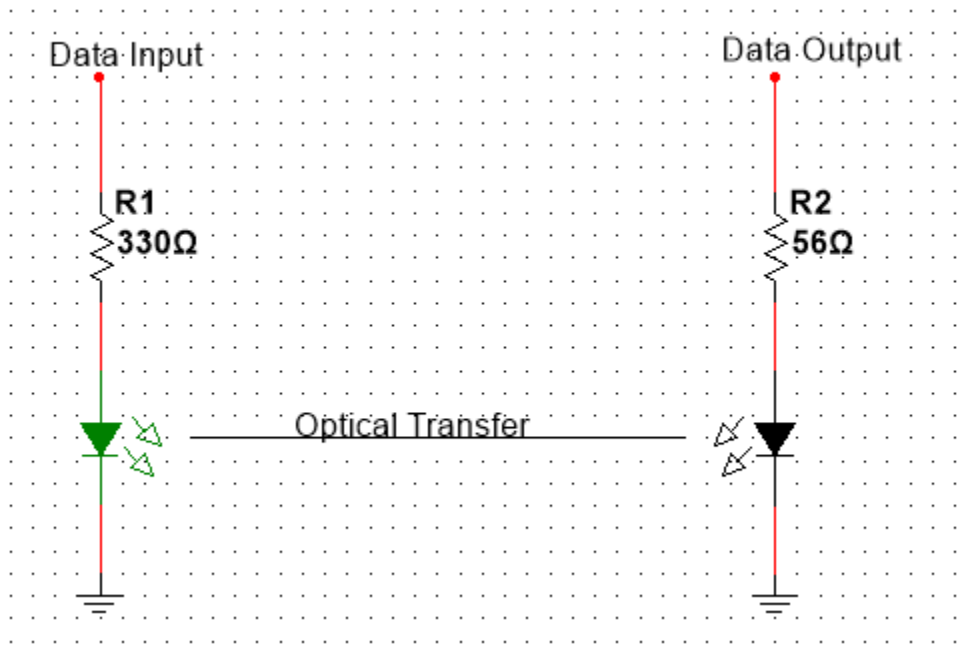
VHDL Code

See Appendix A for the Code

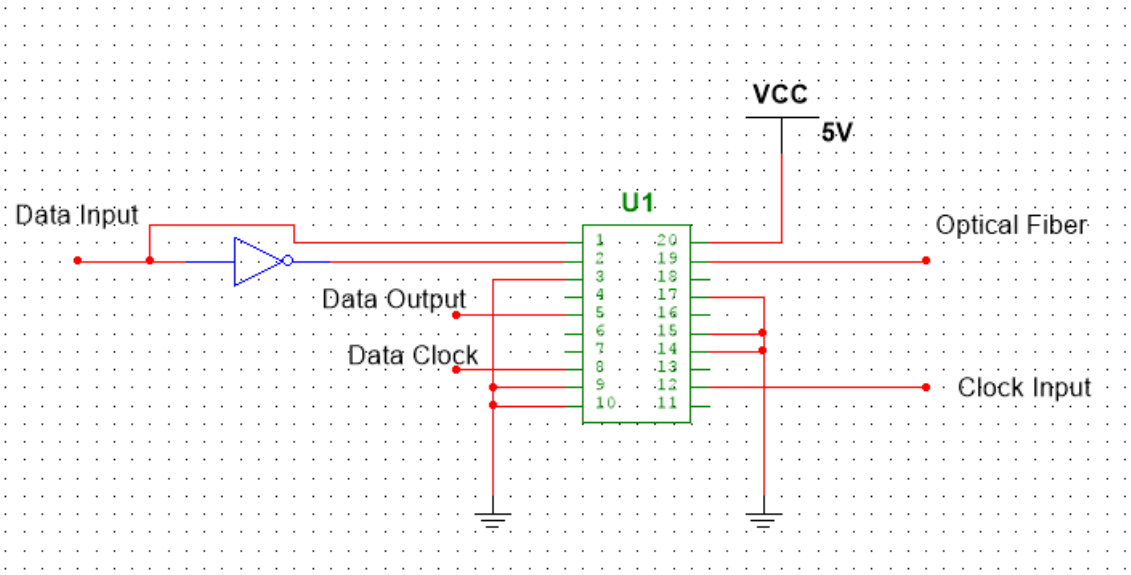
Manchester Encoder



Optical Fiber Transfer



Manchester Decoder



Altera Board TDM Receiver System

VHDL Code

See Appendix A

Data Display

See Appendix A for Code

Testing

Test Value	Input Display	Output Display
00	01	01
FF	FE	FE
05	05	05
A5	A5	A5
CC	CC	CC
DD	DD	DD

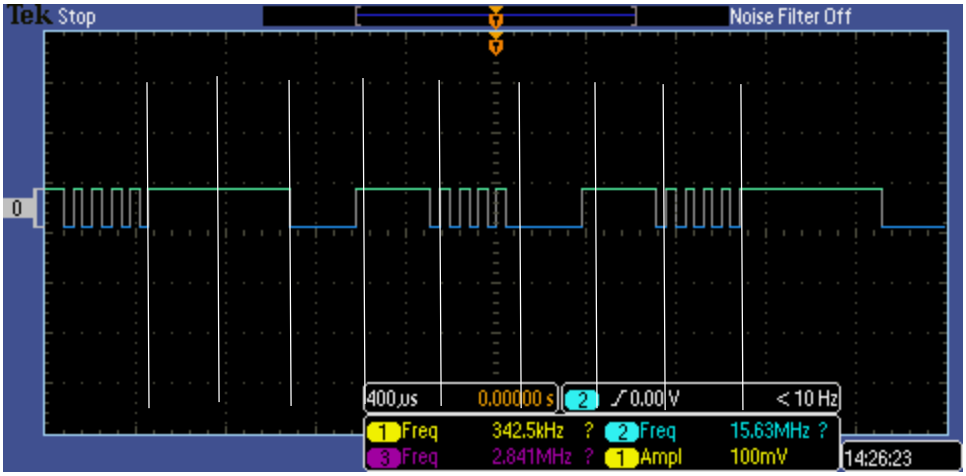


Figure 1 Output Frame

Frame bit 1: FF
Frame bit 2: FF
Frame bit 3: 01
Frame bit 4: FE
Frame bit 5: AA
Frame bit 6: 01
Frame bit 7: FE
Frame bit 8: AA

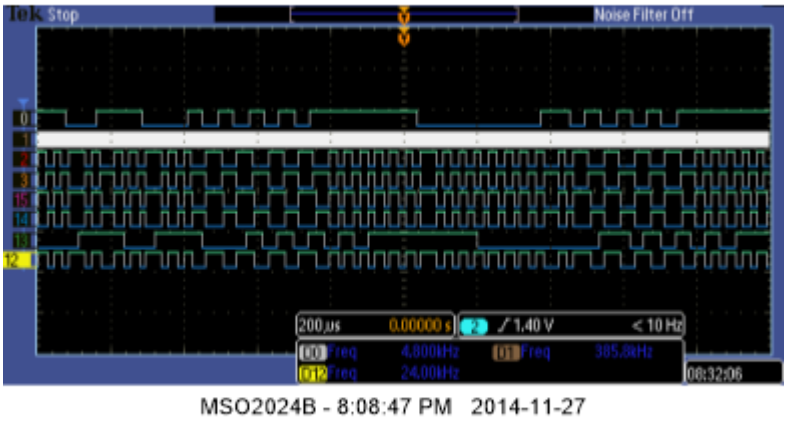


Figure 2 Data Transfer

Probe 0: Sender Output Data
Probe 1: 16x Clock Output for Manchester Encoder
Probe 2: Encoded Manchester One
Probe 3: Encoded Manchester Zero
Probe 15: Optical Transferred Manchester One
Probe 14: Probe 15 inverted for decoder input
Probe 13: Decoded Data
Probe 12: N/A

Comparison

Planned	Achieved
TDM Sender	TDM Sender
TDM Receiver	TDM Receiver
Man. Encoder	Man. Encoder
Man. Decoder	Man. Decoder
External Display	External Display

All of the elements that we planned were achieved.

The final implementation was a success. It was a lot of work but we were able to achieve the requirements that we set for ourselves and achieve a high standard. It was a good learning experience and an excellent opportunity to implement the new skills learned in class. The project left a positive impact on our group and we are glad to have completed the project.

Optical Characterization

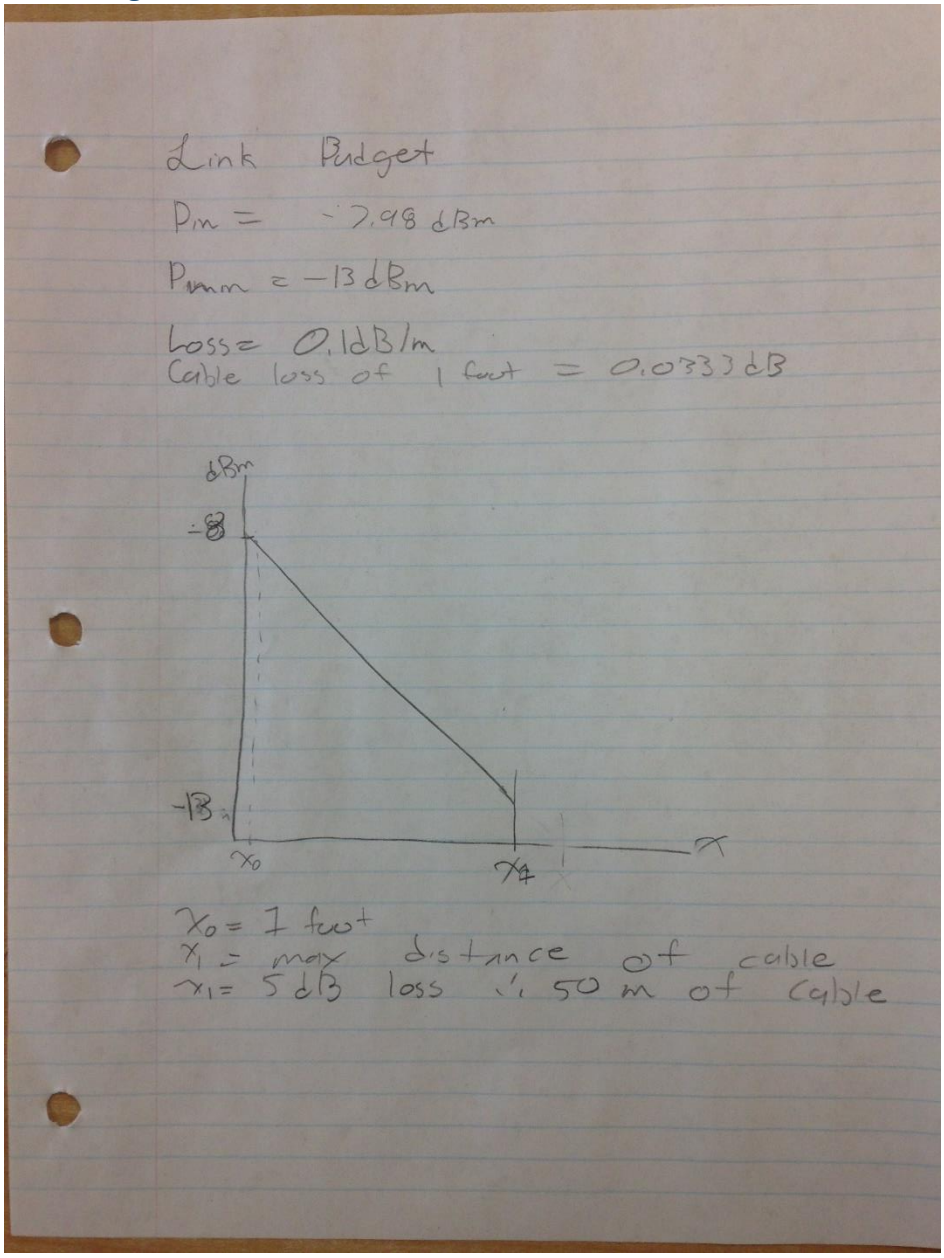
Red LED Power = 160 uW

Cable Loss

$Loss = \left(\frac{0.1dB/m}{1/3m}\right)$ = 0.0333333dB

The WDM results were recorded in Optics Lab 2.

Link Budget



Appendix A - Code