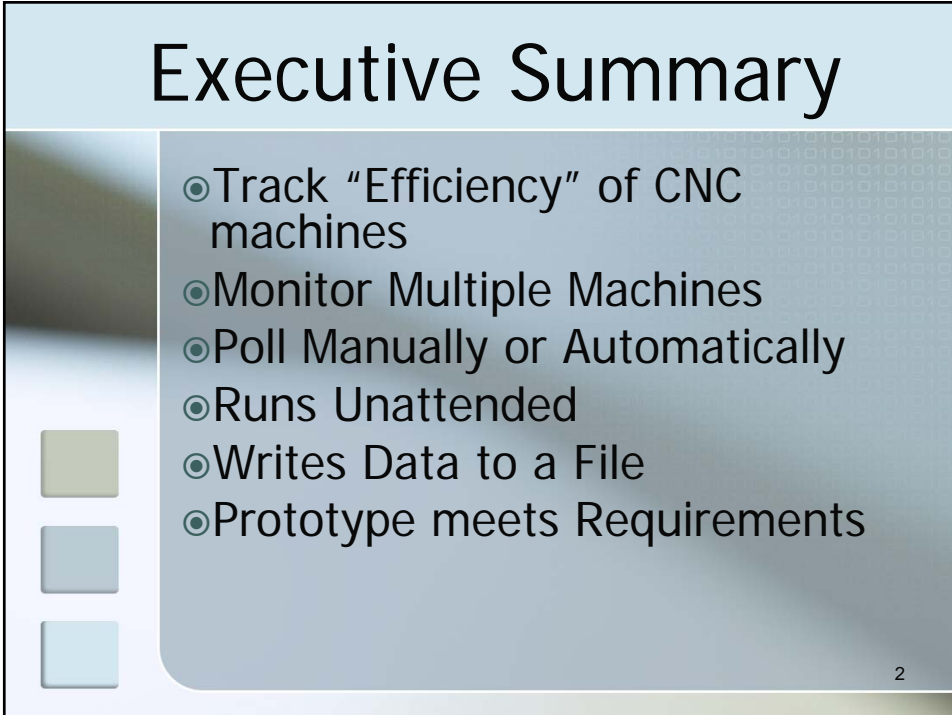


# Machine Monitoring And Data Collection System for Production Efficiency Improvement of CNC Machine Cells

May 3, 2013

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## Executive Summary

- ◉ Track "Efficiency" of CNC machines
- ◉ Monitor Multiple Machines
- ◉ Poll Manually or Automatically
- ◉ Runs Unattended
- ◉ Writes Data to a File
- ◉ Prototype meets Requirements

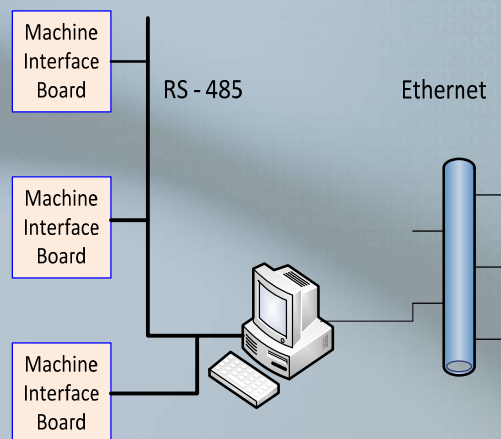
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# Introduction

- ⦿ This project would collect data on Machining run times
- ⦿ No Practical way to measure machine efficiency
- ⦿ Data as a Reference
- ⦿ Process Change effects

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# System Design Overview



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# System Design

## Hardware

- Custom Board to Interface with Machine
- Cable suitable for RS – 485 Network
- Industrial Embedded PC

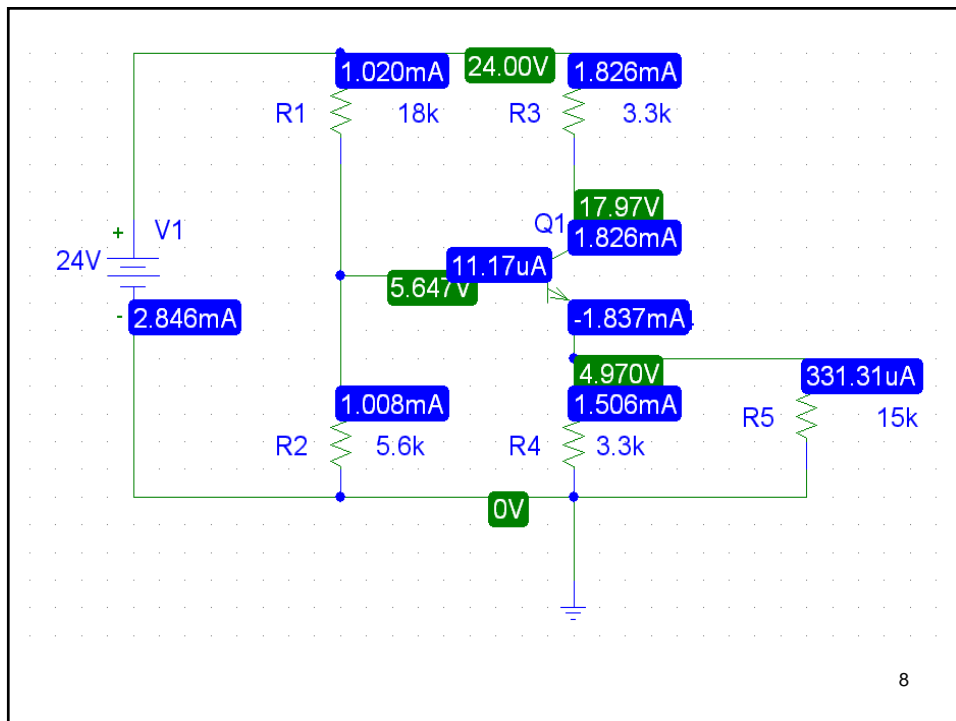
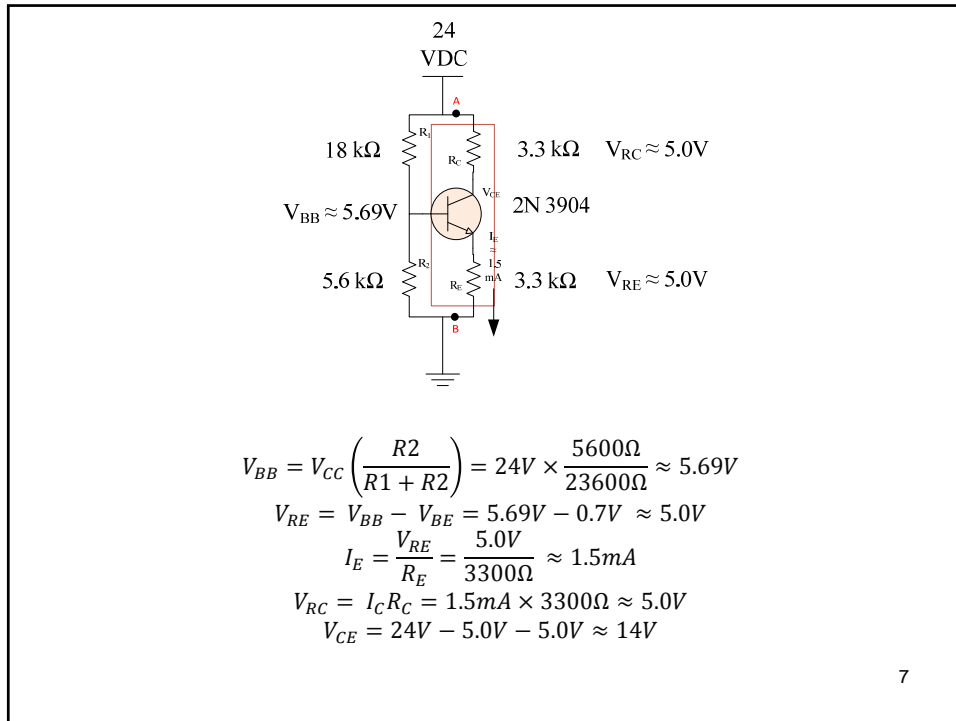
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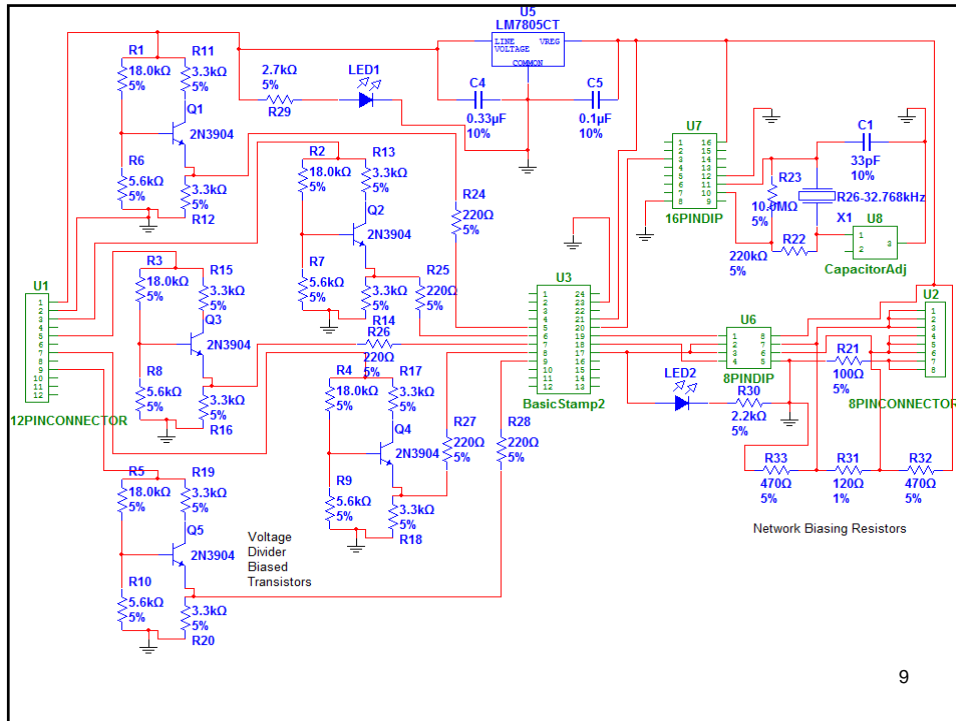
# System Design

## Software

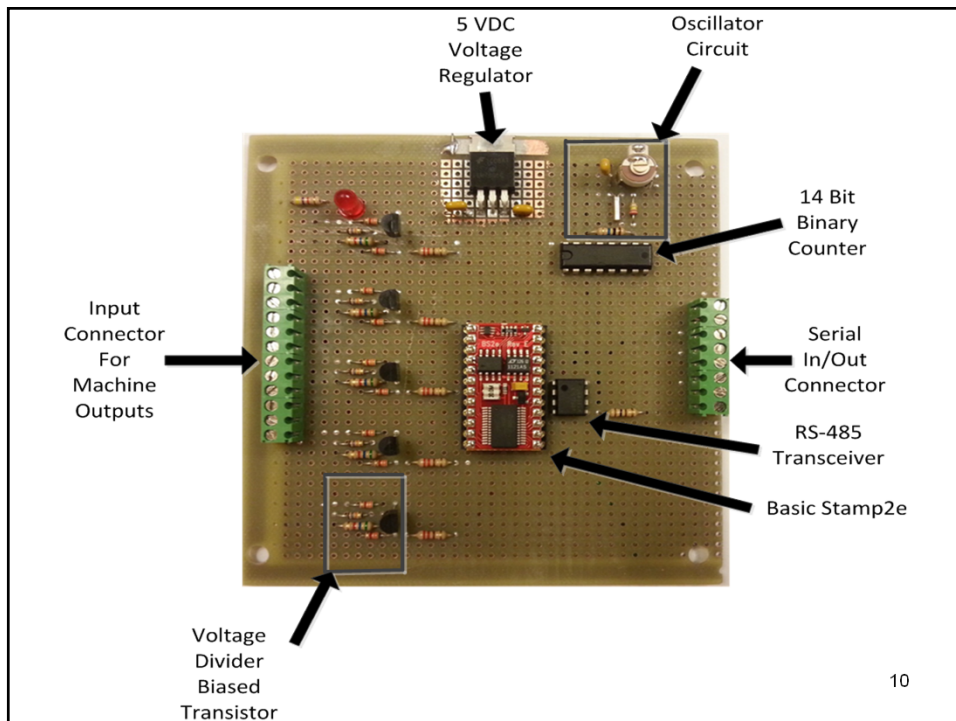
- Windows Embedded Standard(2009)
- PBasic
- Visual Basic 6

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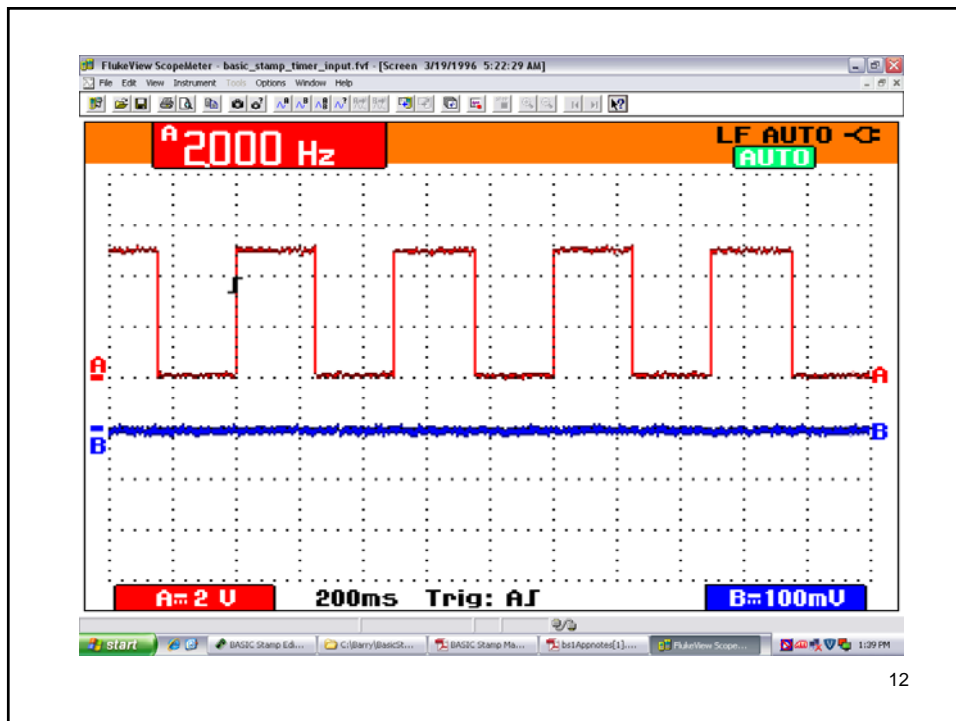
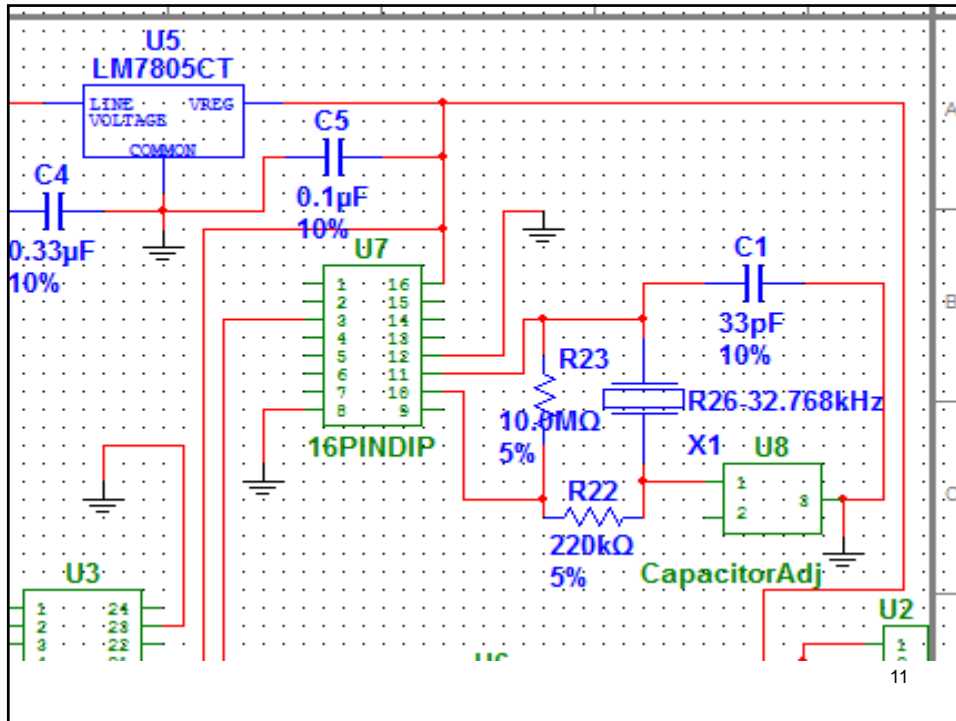




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' -----[ Main Program ]-----

-----  
 'On clock signal transition  
 increment timing and check for  
 serial in from master node  
 'for 200 ms.

Main:

IF IN15 = time.BIT0 THEN

GOSUB Tick

GOSUB PollCheck

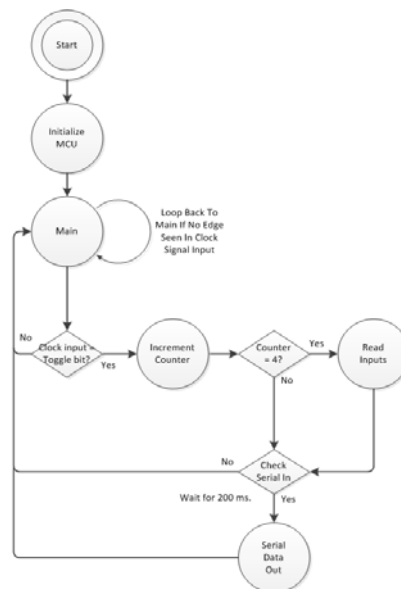
ENDIF

GOTO Main

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## Software Design

Basic Stamp2e



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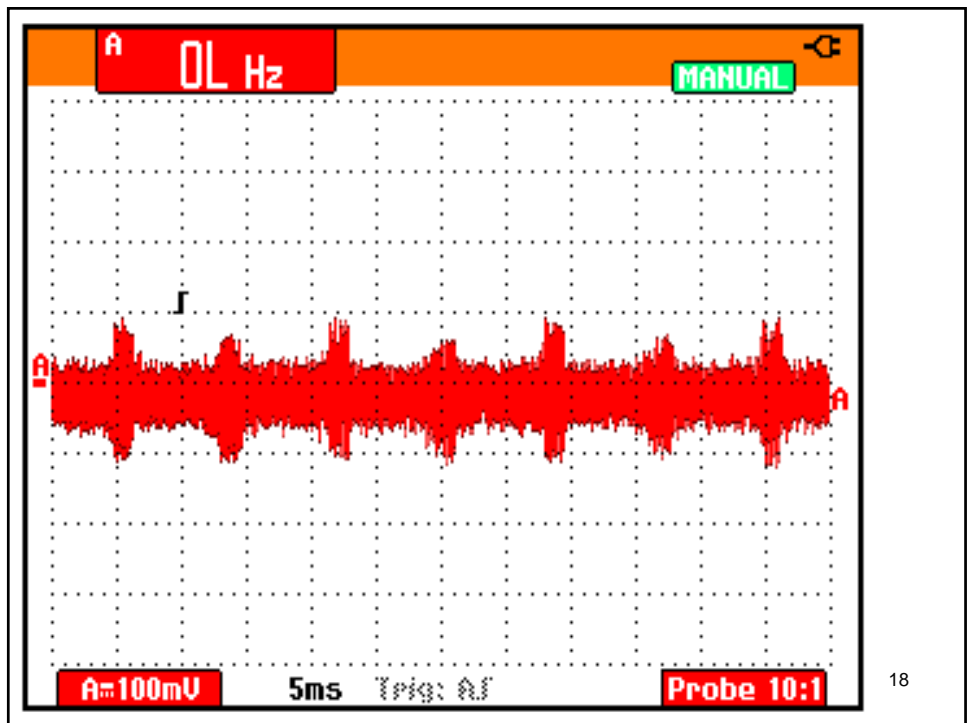
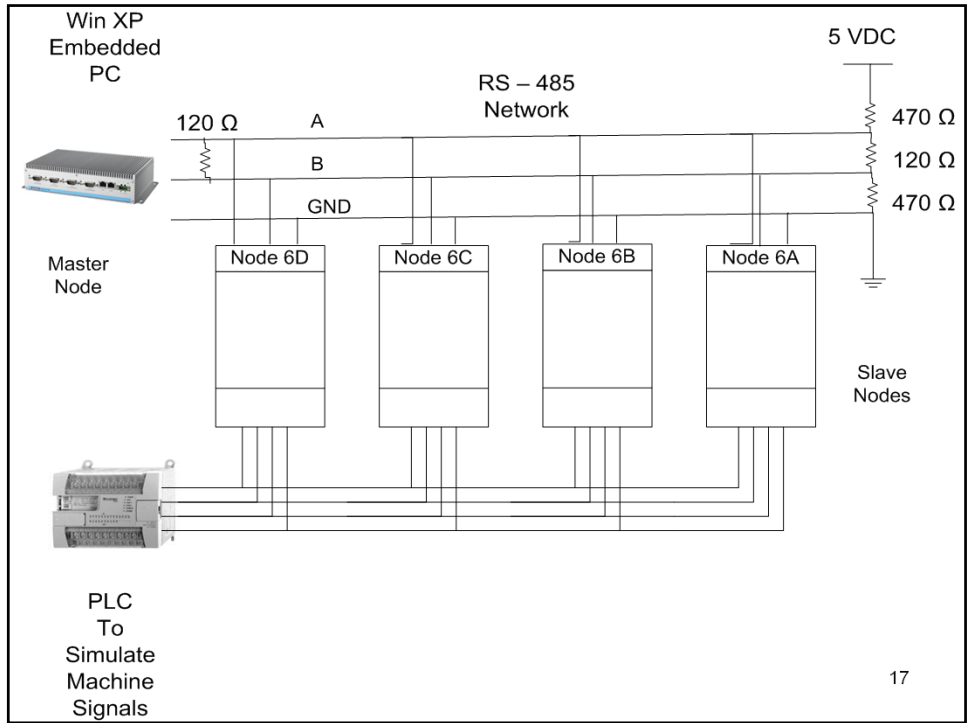
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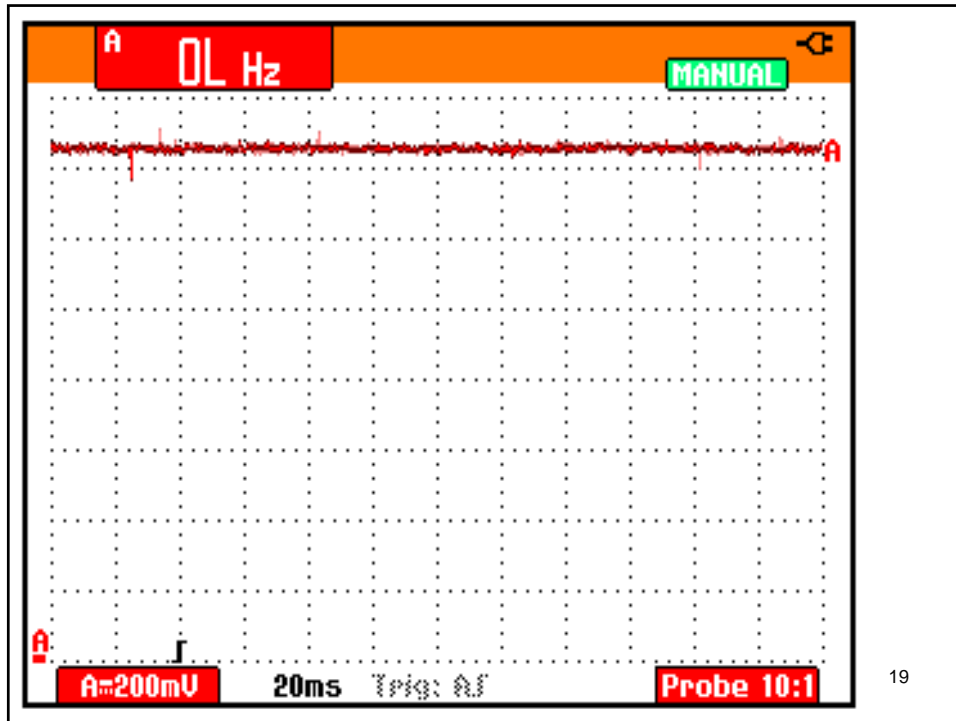
- 22 AWG
- 10 Mbps Maximum Transfer Rate
- Up to 32 Devices



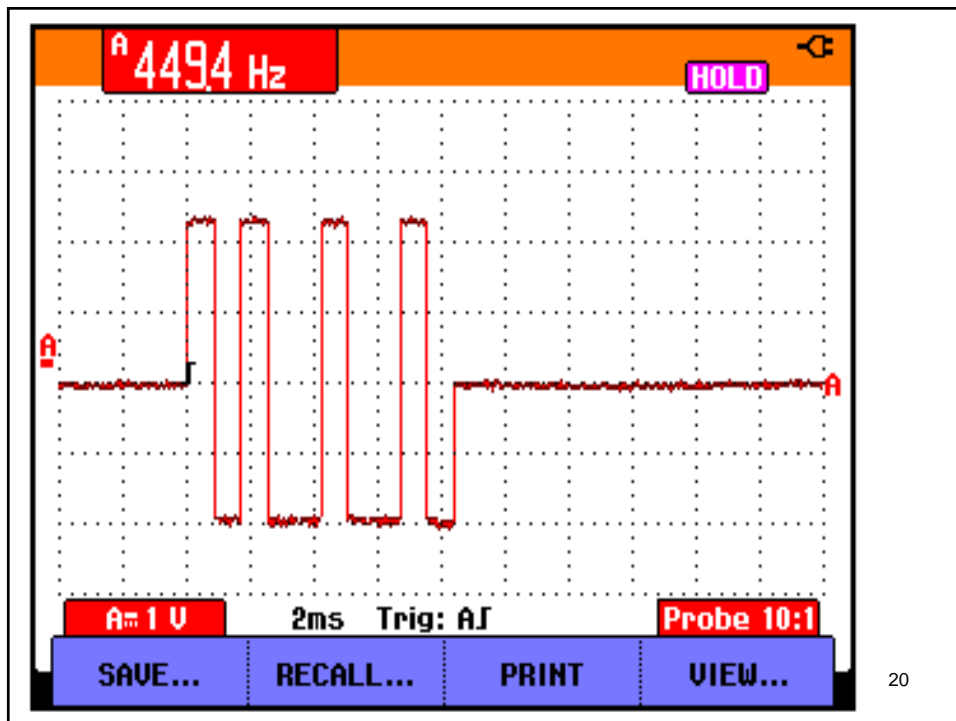
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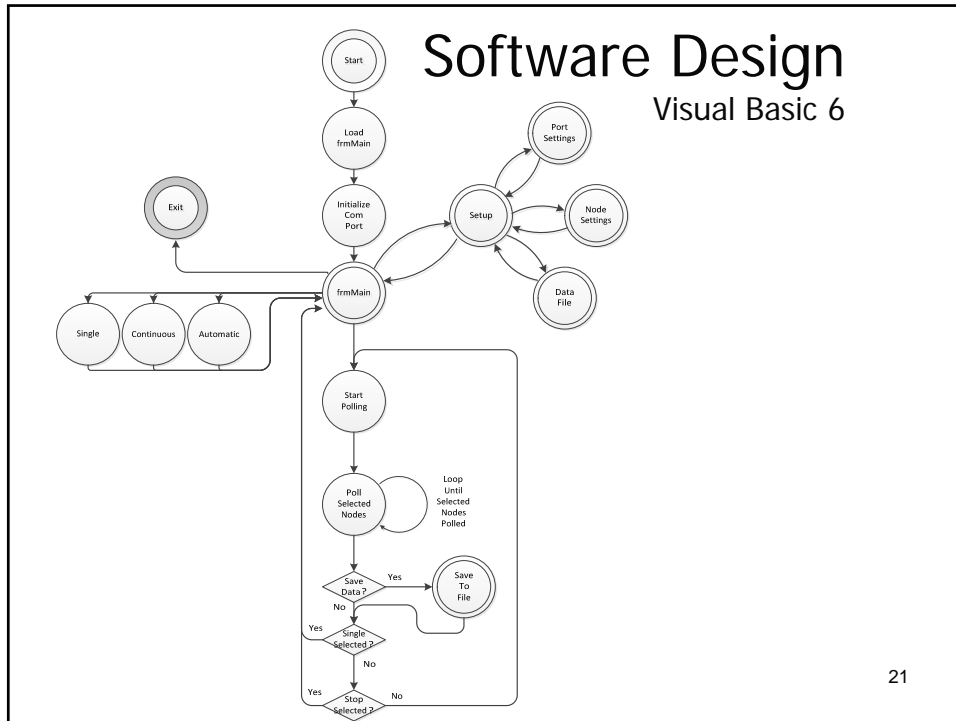




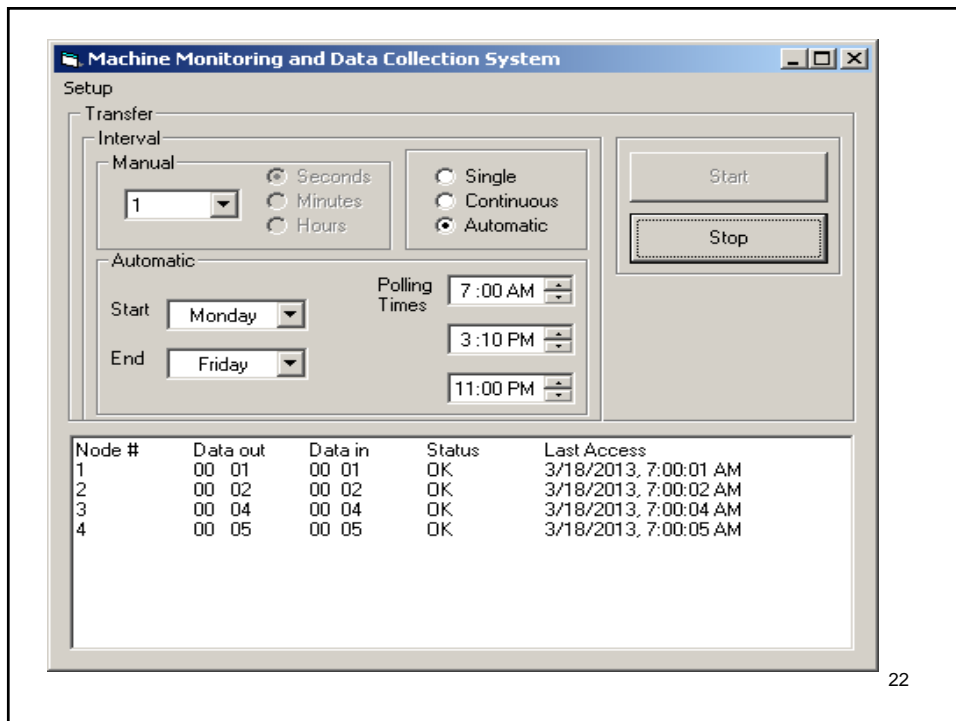
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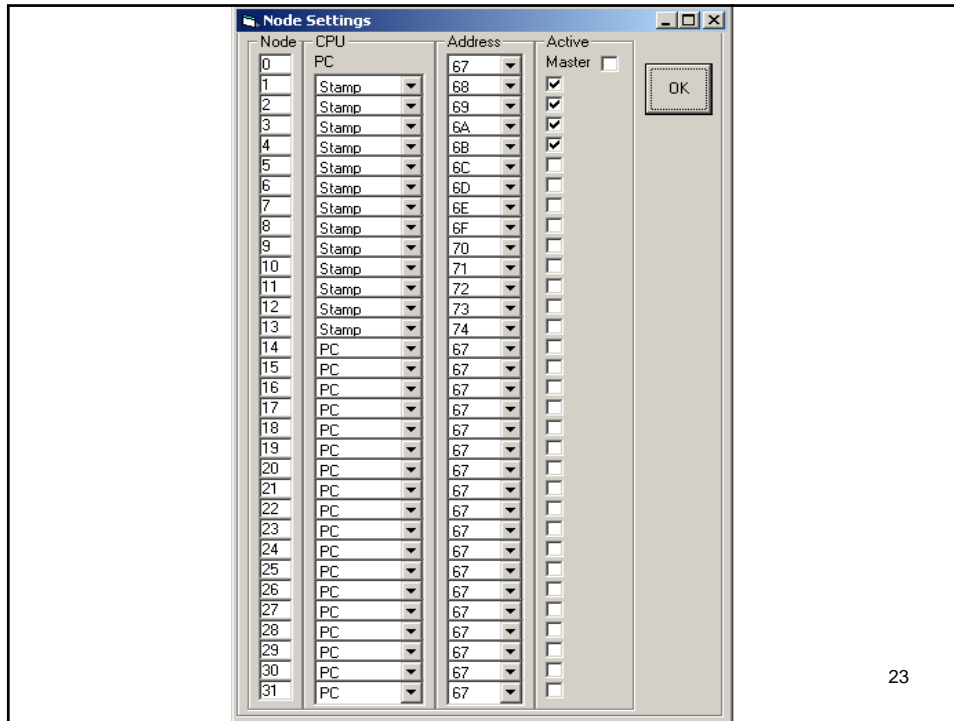
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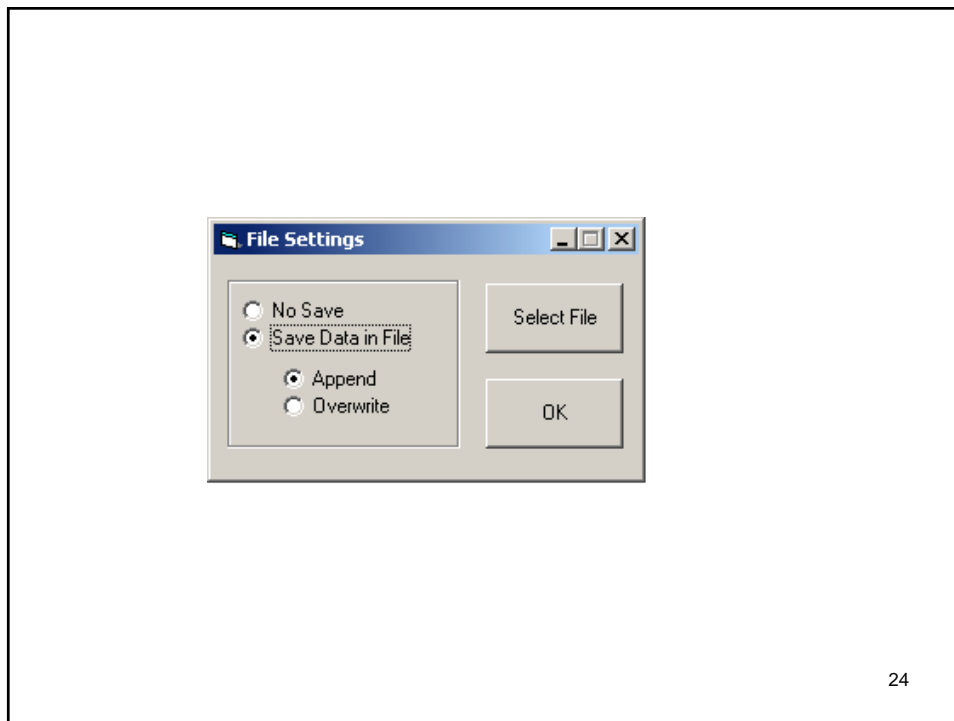
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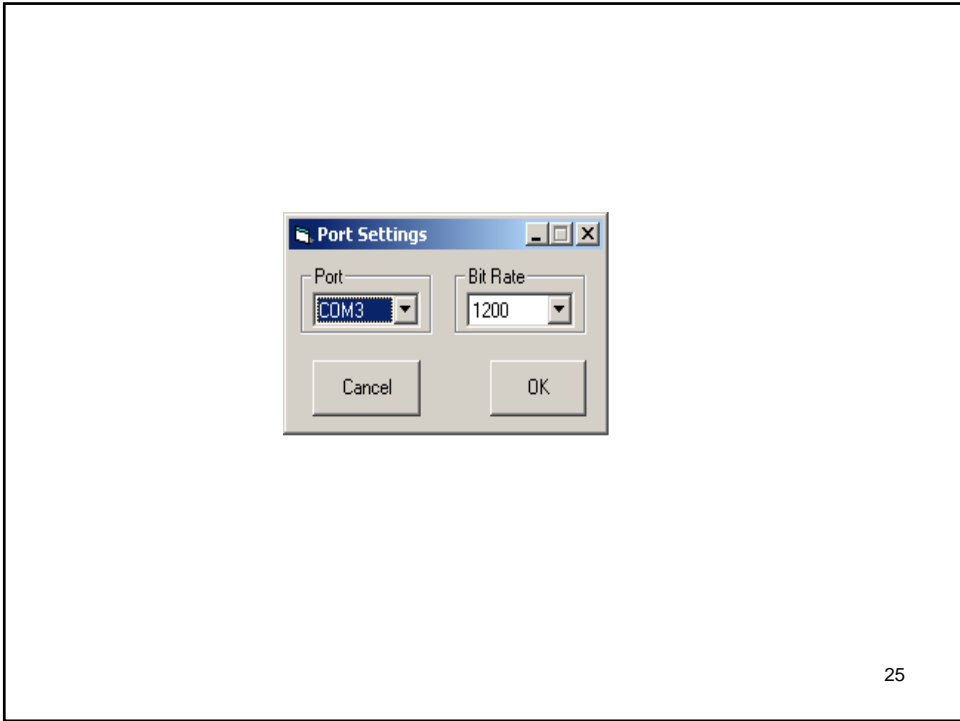
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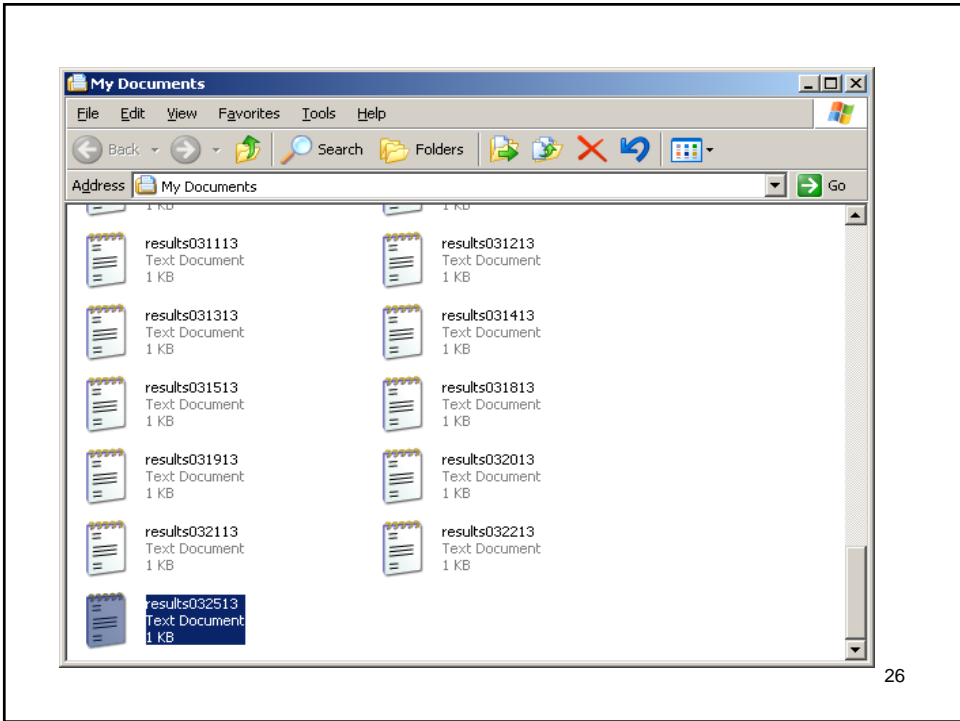
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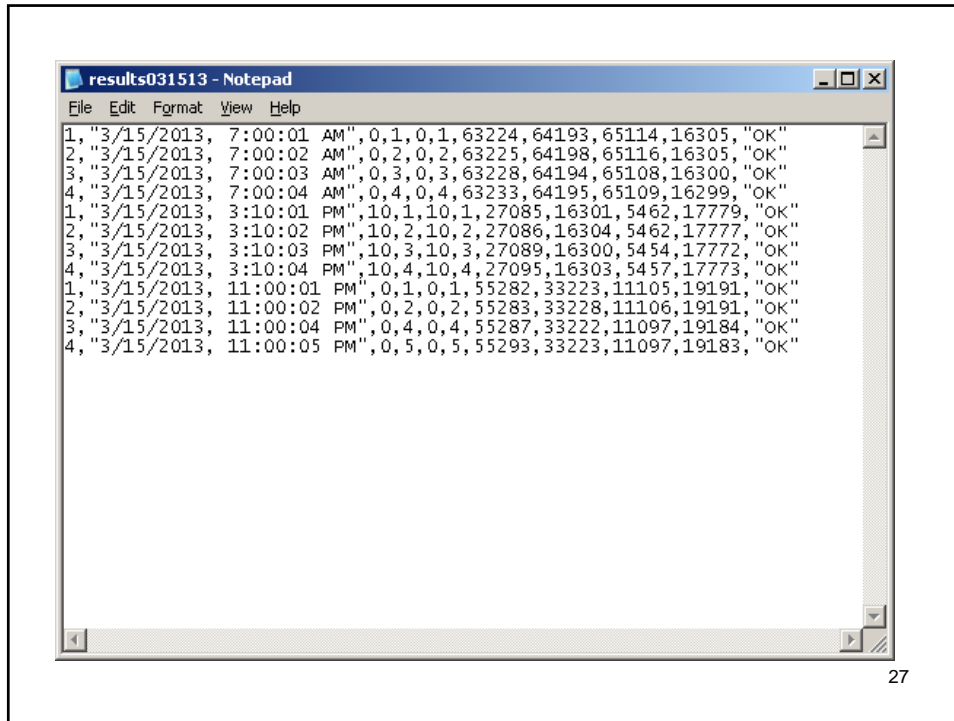
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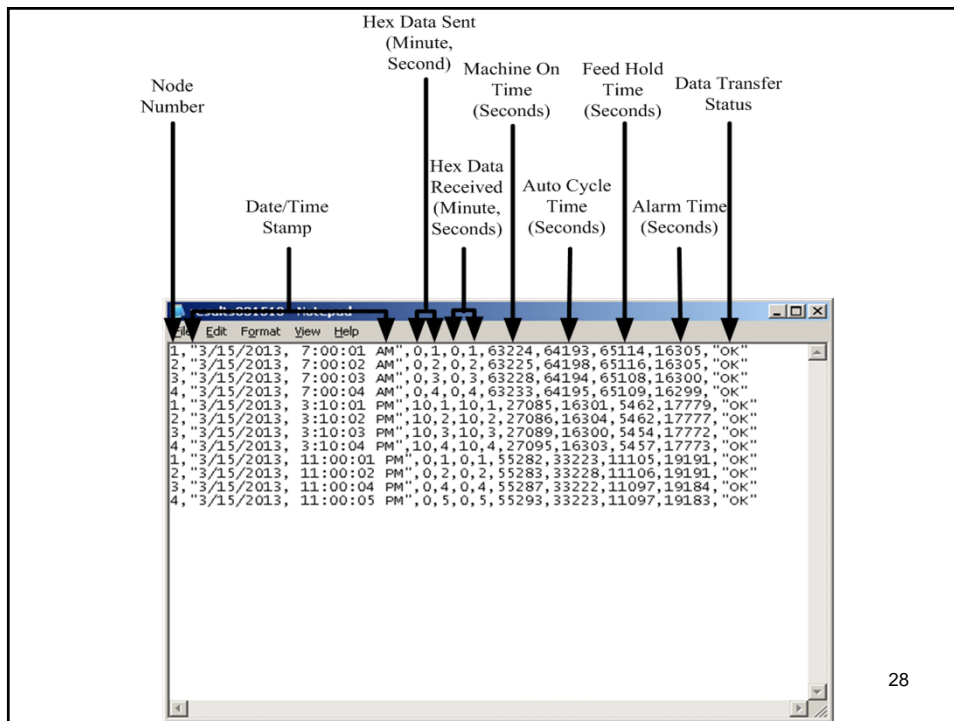
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## Cost

- Parts = \$1497.46
- 7% Over Budget Includes Parts for 4<sup>th</sup> Board
- 300 hrs. labor @ \$23 = \$6900
- Total cost = \$8397.46

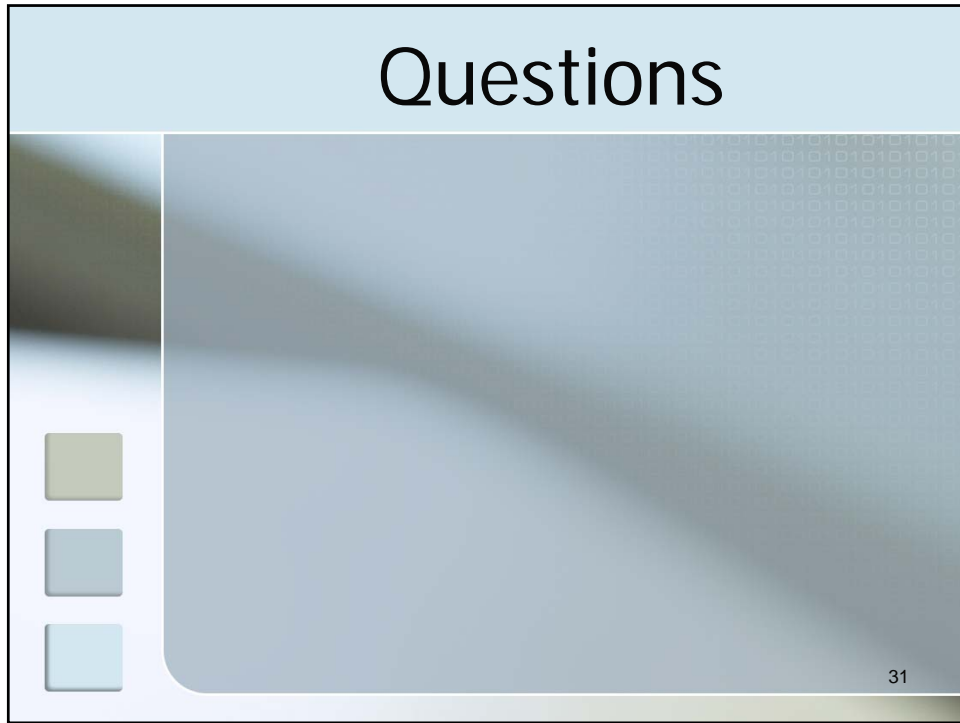
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## Conclusion

- Tracks Machine Times
- PC and Microcontroller Network
- Runs Unattended
- System Track Machine Times
- Project Successful but not on Schedule
- Meets Requirements
- Total cost = \$8397.46

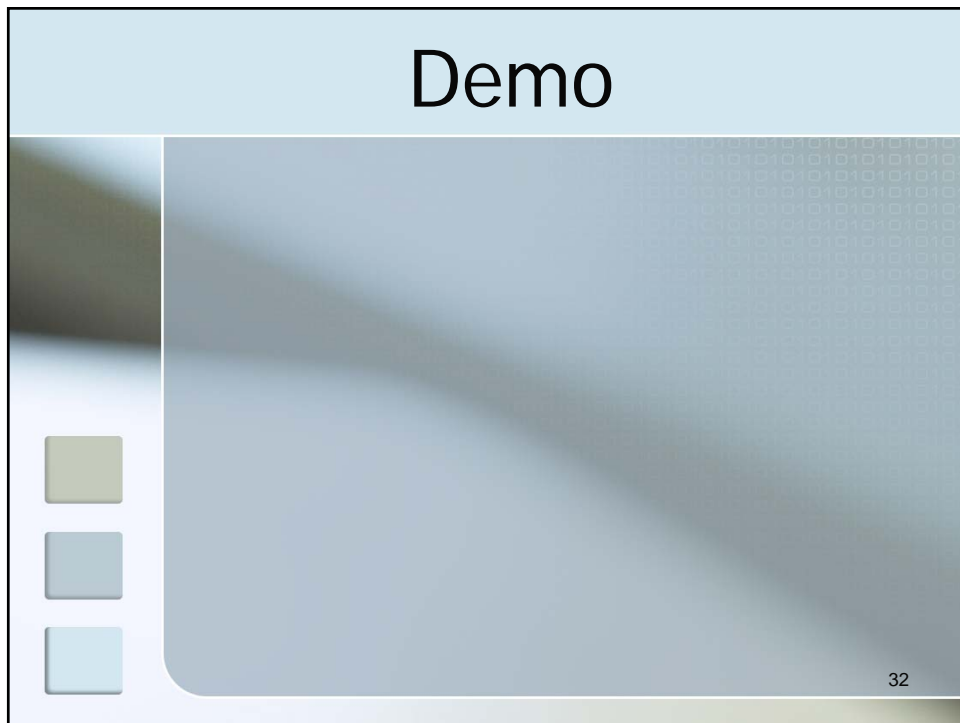
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# Questions



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# Demo



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