

**LAB 5 DEMO – Building a Microprocessor Based System and Application**

**Reviewer** \_\_\_\_\_

**Team** \_\_\_\_\_

**Microprocessor Based System (455)**

**Extra Credit** \_\_\_\_\_

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Microprocessor Based Serial I/O System	335
Peripheral Subsystem	150
Input and Output	
Serial Data In	70
16x Clock	
Start Bit Detect → Enable Counters	
Bit Sample Count	
Bit Identification Count	
Shift Register In	
Receive Buffer	
Signal Receive Character Complete	
Serial Data Out	70
16x Clock	
Transmit Enable → Enable Counters	
Bit Sample Count	
Bit Identification Count	
Transmit Buffer	
Shift Register Out	
Signal Transmit Character Complete	
Monitoring LEDs	10

NIOS Processor Serial Interface and Control	135
Serial Data In	50
How is Received Data available signaled?	
Read data from Receive Buffer when available	
Serial Data Out	50
How is Transmit Buffer empty signaled?	
Load data to Transmit Buffer when available	
Display data in and out on Console	20
Protocol	15
Received Message Complete	
Transmitted Message Complete	
Test	50
Test Plan	50
<b>Scanner Control</b>	120
<b>Control Sequence – Talk to Self</b>	40
Microprocessor sends <i>StartScanning</i>	5
Active Scanner begins collecting data	5
Active Scanner sends <i>ReadyToTransfer</i> to Microprocessor	5
Microprocessor sends <i>RequestToTransfer</i> to collection station	5
Collection station sends <i>OKToTransfer</i> to microprocessor	5
Microprocessor sends <i>Transfer</i> to scanner	5
Active Scanner sends data to Microprocessor	5
Microprocessor formats data and sends single bytes to collection station	5
<b>Control Sequence – Talk to Another Board</b>	80
Talk as Gondola to another board as Collection Station	40
Microprocessor sends <i>StartScanning</i>	5
Active Scanner begins collecting data	5
Active Scanner sends <i>ReadyToTransfer</i> to Microprocessor	5
Microprocessor sends <i>RequestToTransfer</i> to collection station	5
Collection station sends <i>OKToTransfer</i> to microprocessor	5
Microprocessor sends <i>Transfer</i> to scanner	5
Active Scanner sends data to Microprocessor	5

Microprocessor formats data and sends single bytes to collection station	5
Talk as Collection Station to another board as Gondola	40
Microprocessor sends <i>StartScanning</i>	5
Active Scanner begins collecting data	5
Active Scanner sends <i>ReadyToTransfer</i> to Microprocessor	5
Microprocessor sends <i>RequestToTransfer</i> to collection station	5
Collection station sends <i>OKToTransfer</i> to microprocessor	5
Microprocessor sends <i>Transfer</i> to scanner	5
Active Scanner sends data to Microprocessor	5
Microprocessor formats data and sends single bytes to collection station	5