

# **EE322: Embedded Systems Design - Project**

## **Laser Communication System**

### **Project Progress Report - 2**

30/07/2021

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## Laser Communication System

### Progress from 09th July 2021 to 30th July 2021

#### Overall percentage progress

0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
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## Introduction

In Industrial applications, transmitting and receiving signals with higher precision and accuracy is the prime goal. For the embedded system project, we have designed a model to approach this using a laser beam. The system can transmit 4-bit simplex signals efficiently with a low-cost setup and display the received signal. To approach this, a transmitter and a receiver will be designed separately. For demonstration purposes, the transmitter is input with a 4-bit digital signal and the receiver displays the relevant signal. We aim to achieve this goal using two PIC16F84A microcontrollers for the hardware and Assembly language for scripting.

In this stage, UML state diagrams were created. We have generated the overall vision of the project using the UML diagrams. And also PCB Schematic diagrams for both the Transmitter and the Receiver were designed.

## Progress for the period from 09th July 2021 to 30th July 2021

### UML State diagram

The UML state diagrams are directed graphs in which nodes denote states and connectors denote state transitions which give a clear idea of the functionality of the microcontroller. The created diagram is shown in [Figure 1](#).

### PCB Schematic

The schematic diagram for the Receiver was designed ([Figure 2](#)) and as both Receiver and Transmitter layouts were finished, BOM was generated ([Table 1](#)). And also the required components were ordered and currently, they are in transit.

### Note

- [Progress report 1](#)
- Assembly scripting is ongoing and the PCB layouts also will be completed within 1-2 weeks. Due to the pandemic situation the hardware prototyping is delayed.

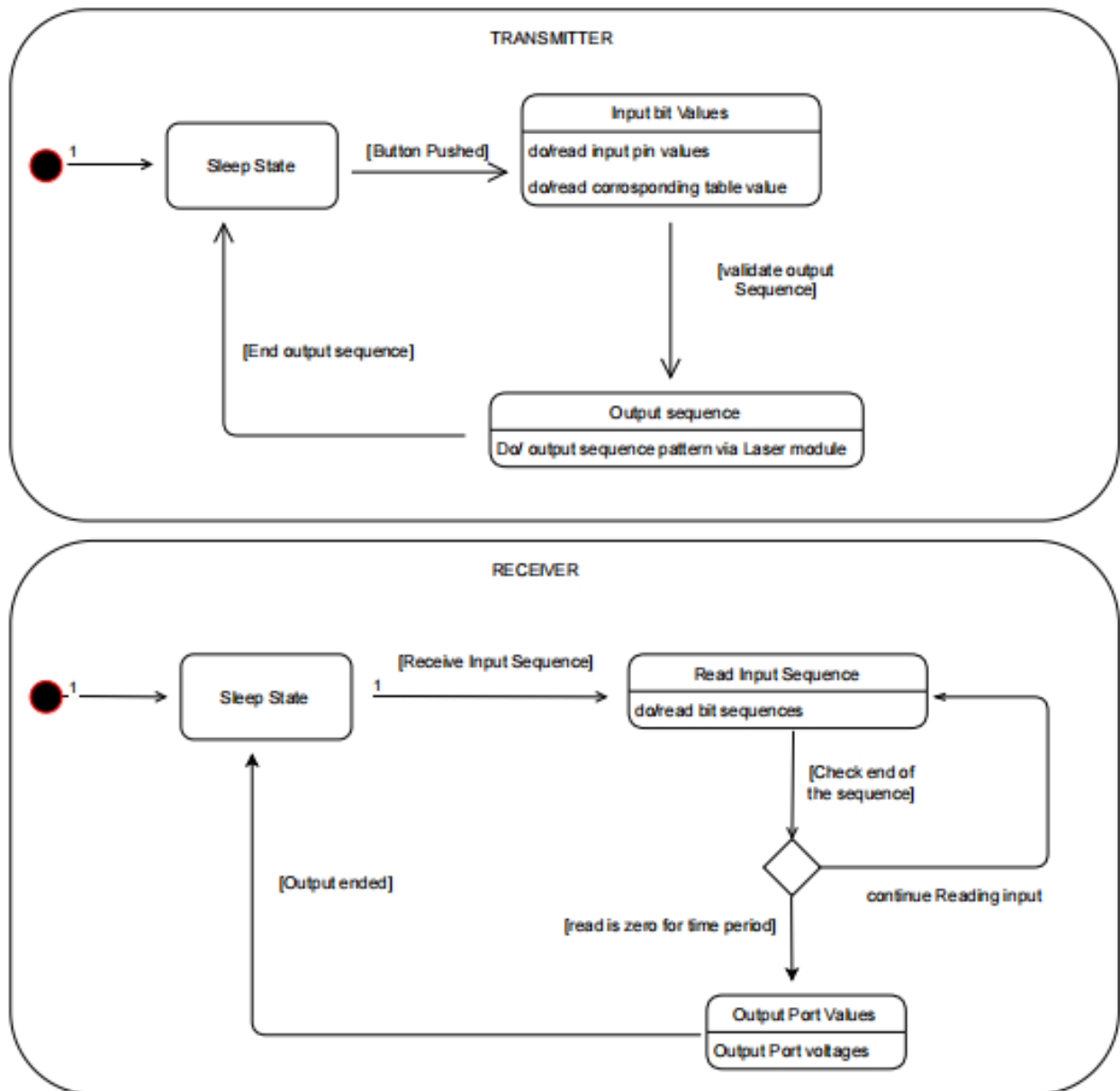


Figure 1: UML - State Diagram

([https://feels.pdn.ac.lk/pluginfile.php/60474/mod\\_data/content/11091/G18\\_UML\\_State\\_Diagram\\_EE322.pdf](https://feels.pdn.ac.lk/pluginfile.php/60474/mod_data/content/11091/G18_UML_State_Diagram_EE322.pdf))

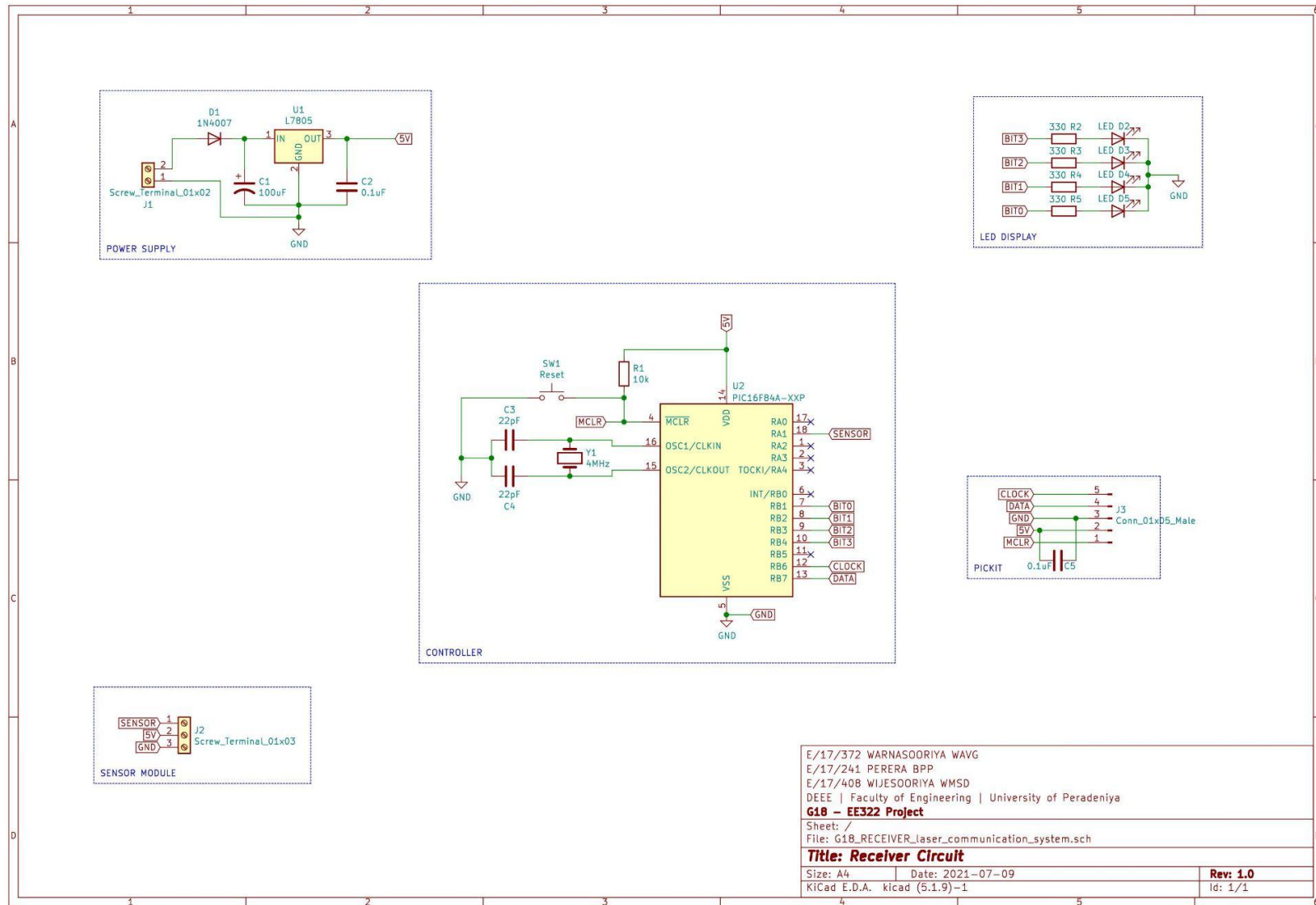


Figure 2 : Receiver Schematic Layout

Table 1: Bill of Materials

Qty	Value	Cmp name	Footprint
2	100uF	CP1	Capacitor_THT:CP_Radial_D6.3mm_P2.50mm
4	0.1uF	C	Capacitor_THT:C_Disc_D4.7mm_W2.5mm_P5.00mm
4	22pF	C	Capacitor_THT:C_Disc_D4.7mm_W2.5mm_P5.00mm
2	1N4007	1N4007	Diode_THT:D_DO-41_SOD81_P10.16mm_Horizontal
2	Screw_Terminal_01x02	Screw_Terminal_01x02	TerminalBlock_Phoenix:TerminalBlock_Phoenix_MPT-0,5-2-2.54_1x02_P2.54mm_Horizontal
2	Screw_Terminal_01x03	Screw_Terminal_01x03	TerminalBlock_Phoenix:TerminalBlock_Phoenix_MPT-0,5-3-2.54_1x03_P2.54mm_Horizontal
2	Conn_01x05_Male	Conn_01x05_Male	Connector_PinHeader_1.00mm:PinHeader_1x05_P1.00mm_Vertical
7	10k	R	Resistor_THT:R_Axial_DIN0207_L6.3mm_D2.5mm_P7.62mm_Horizontal
1	Send_button	SW_Push	Button_Switch_THT:SW_PUSH_6mm_H4.3mm
1	SW_DIP_x04	SW_DIP_x04	Button_Switch_THT:SW_DIP_SPSTx04_Slide_9.78x12.34mm_W7.62mm_P2.54mm
2	Reset	SW_Push	Button_Switch_THT:SW_PUSH_6mm_H4.3mm
2	L7805	L7805	Package_TO_SOT_THT:TO-220-3_Horizontal_TabDown
2	PIC16F84A-XXP	PIC16F84A-XXP	Package_DIP:DIP-18_W7.62mm_LongPads
2	4MHz	Crystal	Crystal:Crystal_HC18-U_Vertical
1	KY008	LASER module	
4	LED	LED	
4	330 R		
2	(for PIC16F84A)	18 pin IC Base	
1	Single side	Copper board	
1	Double side	Copper board	
2		9V Battery adapter	
2		9V Battery	
1		Pickit 3	
100g		FeCl3	

## Timeline (Gantt chart)

Table 2 :Timeline

Task	JUNE		JULY				AUGUST			
	3rd Week	4th Week	1st Week	2nd Week	3rd Week	4th Week	1st Week	2nd Week	3rd Week	4th Week
Creating project groups	Planned									
Registering the project Title	Actual									
Preparing the project proposal		Planned								
		Actual								
Simulation and coding UML Diagram			Planned							
			Actual							
Progress Report 1				Planned						
				Actual						
Prototype development and testing (Progress Report 2)					Planned	Planned				
					Actual	Actual	Actual			
Progress Report 3 and Final project submission										



Planned execution time of the task as of the initial proposal

Actual execution time of the task due to delays etc.