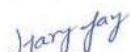


Dated: 23/07/26

TENDER: REQUIRMENT OF FABRICATION OF TEST SETUP

- REFERENCE: CSIO/IMW/OG/23-07-26/02
- QUOTE DURATION: 4 DAYS FROM TENDER
- QUOTE VALIDITY: 90 DAYS, NO ADVANCE/EXTRA PAYMENT WILL BE GIVEN.
- PAYMENTS WILL BE CLEARED AFTER SUCCESSFUL INSPECTION
- TECHNICAL DETAILS: ATTACHED IF REQUIRED PL CONTACT AT MAIL ID.
- CUSTOMIZED FABRICATION AS PER LOCAL/ONSITE REQUIREMENTS
- VALID TEST REPORT
- TERMS & CONDITIONS AS PER CSIO RULES.
- CONTACT DETAILS (FOR ANY QUERY): HARRY.GARG.CSIO@CSIR.RES.IN
- [QTY: 01 SET](#)


Dr. Harry Garg
Principal Scientist

REQUIREMENTS OF EE DESIGN:

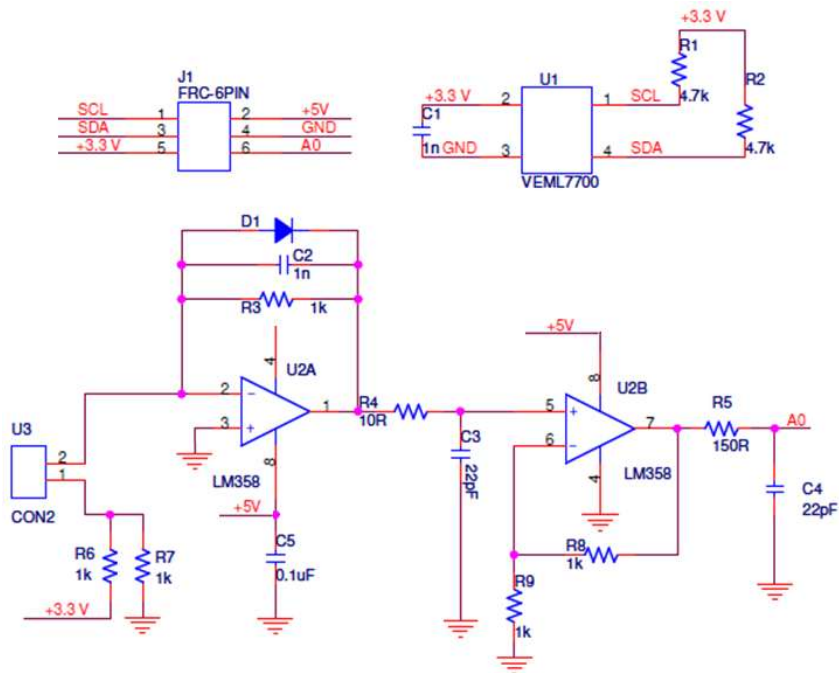


Figure 1: Sensor module electronic circuit schematic

1.1 Controller Module

There are a total of five sensor modules distributed across the system at different angles. Each sensor module utilizes one VEML7700 sensor for measuring visible light brightness levels and one infrared (IR) ODD-1B sensor for measuring IR intensity levels. These sensor modules are strategically positioned at specific angles, and a controller is used to select and measure the intensity of the VEML7700 (Visible Lux) and ODD-1B (IR) values, displaying the results on LCD screen.

The system switches between two types of measurements: Visible light levels and Infrared light levels. It includes a reset switch and four sensor selection switches to monitor a specific sensor (by default, Sensor 1 is selected) and display the instantaneous sensor value, average value, and flash count after 60 seconds.

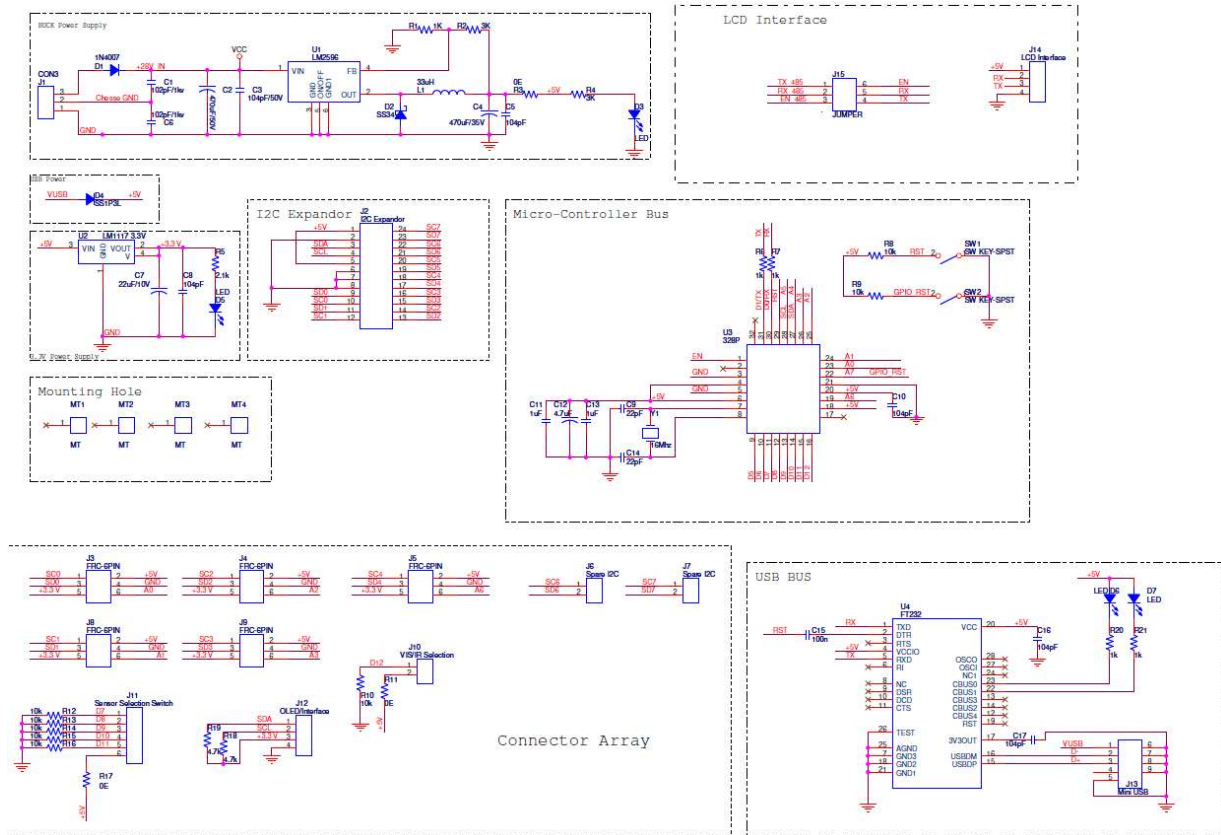


Figure 2: Controller Module Electronic Circuit Schematic

1.1.1 Buck Power Supply Module

The LM2596 simple switcher power converter is a user-friendly, non-synchronous step-down DC-DC regulator that supports an input voltage of up to 40 V. It offers a regulated 5Vdc output and current of up to 3A while maintaining stable line and load regulation. To ensure proper filtering and loop stability, an output capacitor is necessary.

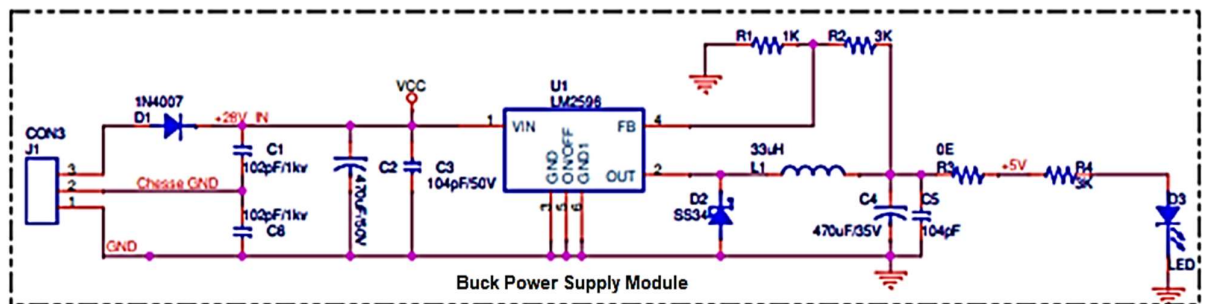


Figure 3: Buck Power Supply Module

1.1.2 LCD Interface

The RX and TX pins of the microcontroller are connected to **J14**, which serves as an interface for transmitting data to the LCD display.

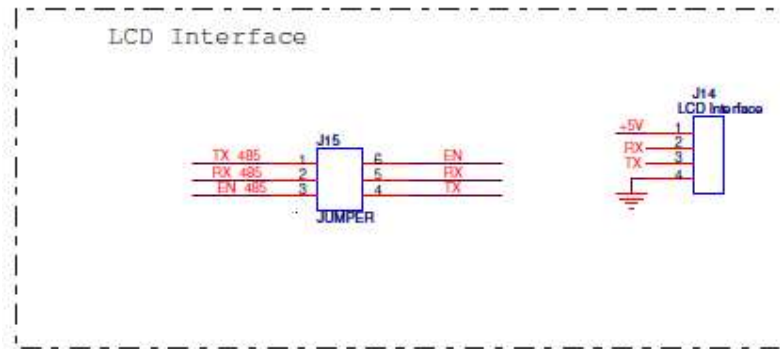


Figure 4: LCD Interface

1.1.3 Micro-Controller Bus

ATmega328P is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega328P achieves throughputs approaching 1MIPS per MHz allowing to optimize power consumption versus processing speed. Microcontroller on controller module accepts the data in on its I2C bus (SCL, SDA pins). Data from sensor modules ODD-1B and VEML7700 processed on microcontroller.

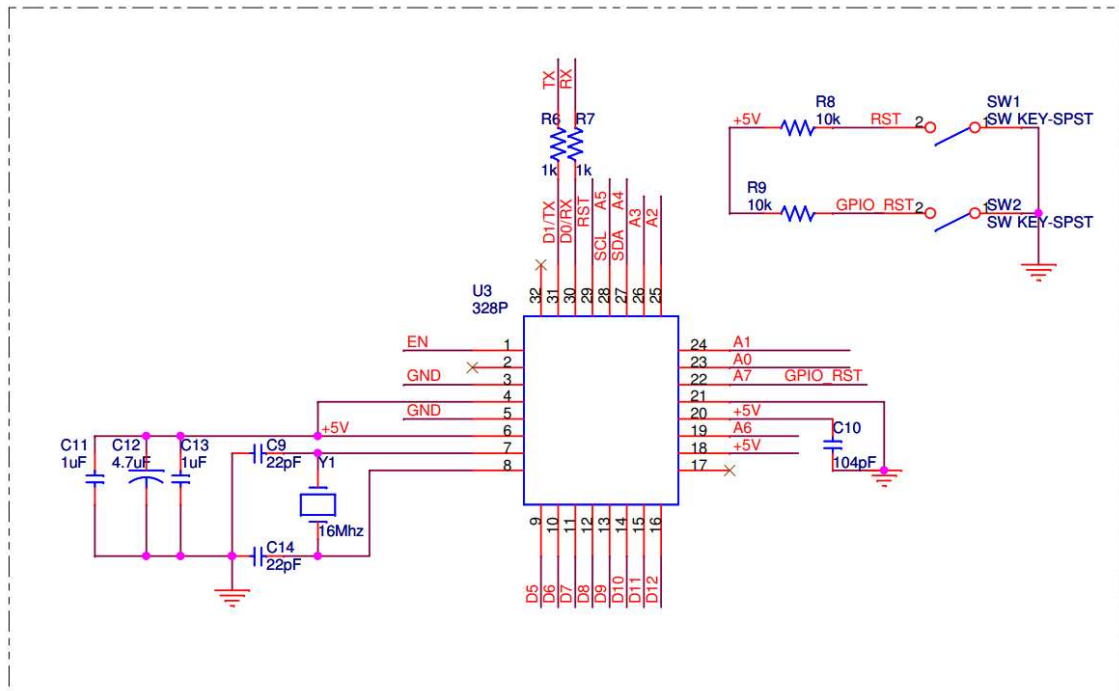


Figure 5: Micro-Controller

1.1.4 USB Bus

The FT232 is a USB to serial UART interface device which simplifies USB to serial designs and reduces external component count by fully integrating an external EEPROM, USB termination resistors and an integrated clock circuit which requires no external crystal, into the device. It has been designed to operate efficiently with a USB host controller by using as little as possible of the total USB bandwidth available. It operates on the **USB 2.0 Full-Speed (12 Mbps) protocol**.

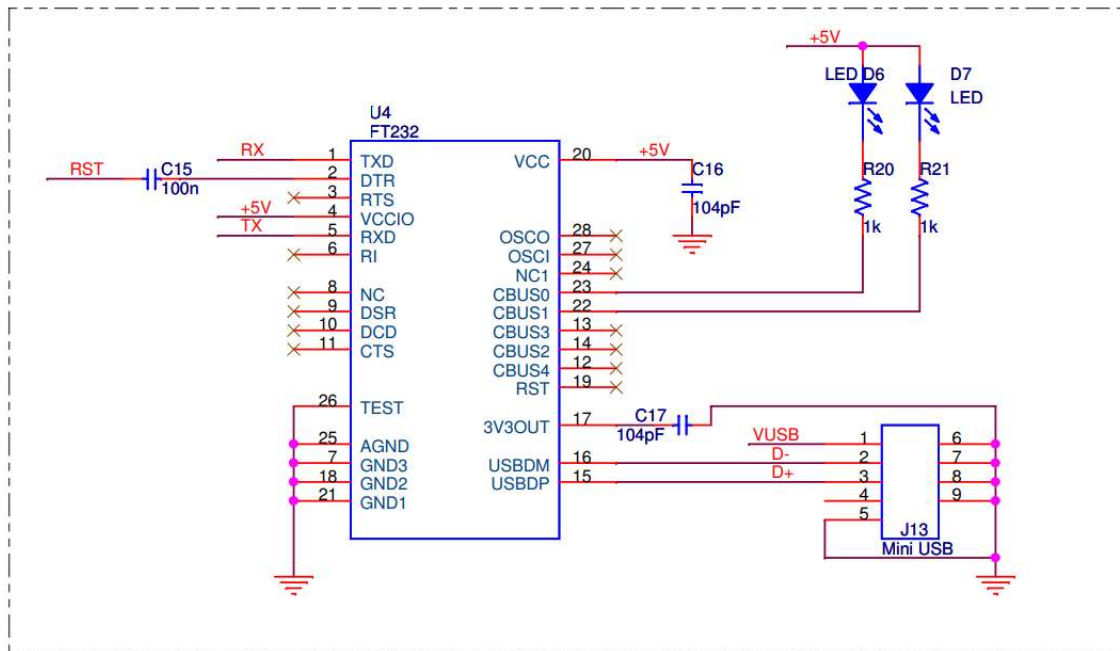


Figure 6: USB interface



Figure 1: Closed Light Intensity (LITR)

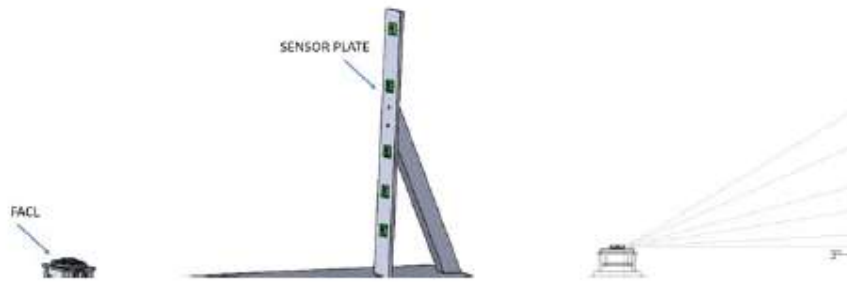


Figure 2: Open Light Intensity Test Rig-1m(LITR)