



# METHOD STATEMENT

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| <b>LOCATION:</b>  | MATH: [151] Monadelphous EECE Lab   |
| <b>TASK/ACTIVITY:</b>   | ELEC5550 Design Project – 2-Way Free-Space Optical Communication System                             |
| <b>PREPARED BY</b><br><b>Name:</b> ELEC5550 Team 0-26<br>Jonathan Chivers (23247451)<br>Varen Lutchmanen (23024474)<br>Tom McAndrew (22710651)<br>James Plummer (23093628)<br>Hannah McLean (22715312)<br>Sumil Saju (24573872) | <b>PERMISSION FOR TASK/ACTIVITY TO PROCEED</b><br><b>Name:</b><br><br><br><br><br><b>Signature:</b> |
| <b>Date:</b> 4 Aug 2025   | <b>Date:</b>  |

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| This document is part of a Job Safety Analysis (JSA) and reflects the findings of an associated risk assessment which is attached. | TICK<br><input checked="checked" type="checkbox"/> |
| JSA Waiver - There are no identifiable hazards associated with this activity which warrant further risk assessment or description. | OR<br><input type="checkbox"/>                     |

## **Purpose**

*What is the reason for the existence of this document? What process does it describe?*

As part of the Unit ELEC5550, Team 0-26, consisting of 6 members, will be designing, constructing, testing and supplying a 2-way free-space optical communication system. This document describes details about the project, as well as the planned project process from design to handover, as part of an overall safety risk assessment for the project.

## **Scope**

*The boundaries of the description including what it covers and its limitations such as specific things it does not address.*

This document is purely a description of the high-level design, construction and testing process. It does not cover any safety matters, or low-level requirements and methods for achieving these high-level process steps. It also does not cover any details for after the construction and testing are complete.

## Method Details:

### 1. Soldering

After Hardware testing is completed, solder components onto the PCB. Use Solder, Soldering iron, flux at the Lab's solder bench. Soldering should be done nearby ventilation. Wear gloves to avoid burns from the soldering iron.

### 2. Assembling – PCB to enclosure

Assembling the driver and receiver PCBs together. Enclosing the PCBs inside a protective cover. Use screws or adhesives according to the need. Wear PPEs if needed while dealing with PCBs.

### 3. Meeting

The workspace is intended to be used for weekly meetings. This is for our informal meetings that are not assessed by the group facilitator due to the shared common space whereby other people could be doing their own work at the same time. The projector could be used to show slides that team members prepared to share, and the whiteboard used for other quick visual drawings.

### 4. Testing Communication Protocol

In order to break the project tasks down into manageable, testable sections, we will need to perform testing purely on the communication transfer from host to device through a dev-kit.

This will only involve the dev-kit, the host and device, and a breadboard with USB mounts (no laser).

Completion of this will indicate a working baseline to then allow the laser system to be incorporated and tested.

### 5. Testing the Laser Communication

Once the communication protocol has been verified to work through the dev-kit (see item 4.), the laser communication will be able to be tested. This will involve using two sets of:

- breadboards with USB mounts
- dev-kits
- laser transmitter and receiver drivers

Each set will be connected to either the host or the device.

### 6. Testing the design

The overall constructed system design will be tested in the workshop. This will include the testing of a functioning transmission and receipt of lasers which can be conducted in a safe environment (no magnifying glass and must maintain a 10cm distance from the laser). All safety functions included in the design such as start and stop buttons will also be tested to ensure operation can be conducted in a controlled environment.

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