Remote Follower self-levelling Platform

MUAATH KH TH D ALFADHLI   **SUPERVISOR: RAY DAVIES**

academi FFOTONEG / PHOTONICS academy

PAWB LASER PHOTONICS DESIGN TEAM

PRIFYSGOL BANGOR UNIVERSITY

Objective

The objective of this Project was to design and construct a remote follower Self-Levelling Platform that incorporated the concepts developed from utilising a non-dispersive Amici Roof Prism with linearly Polarized Light, produced by using two laser sources. The purpose was to let one platform follow another one in direction of angle of rotation either clockwise or counter-clockwise.

Polarization Filter
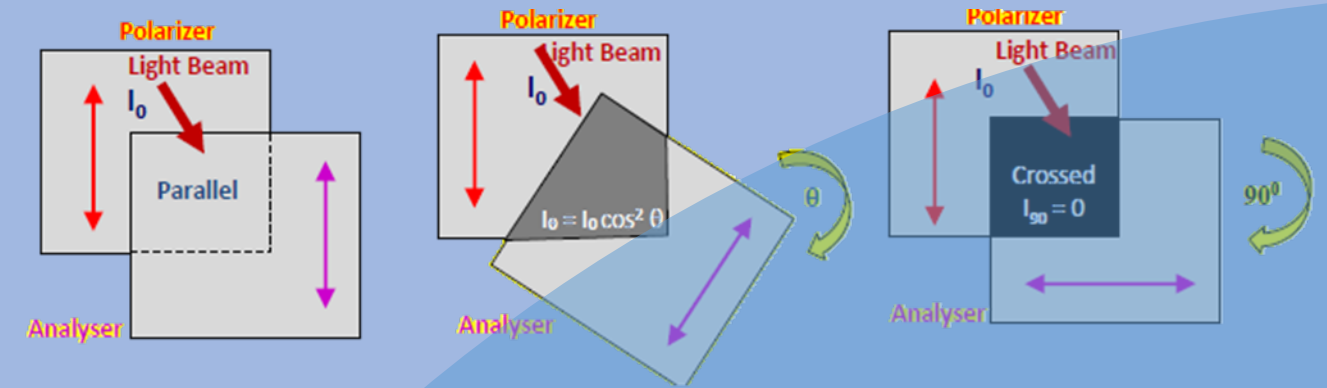
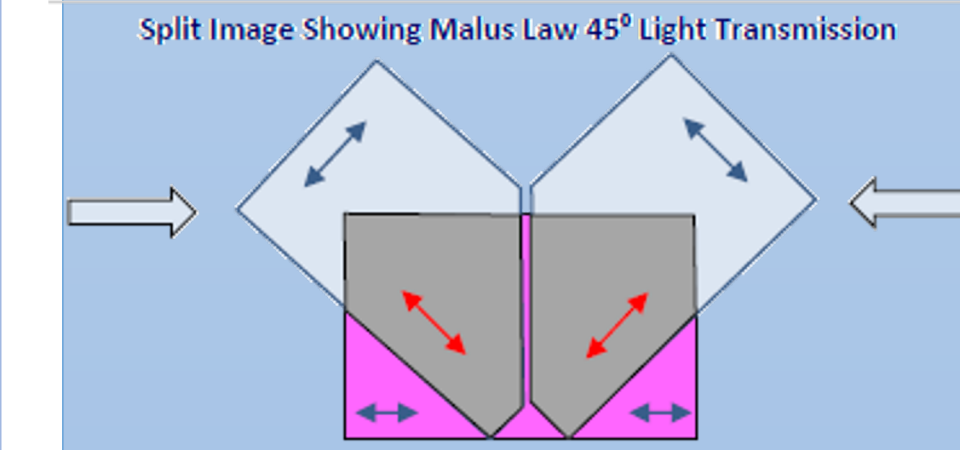
Polarization filter is a filter used to pass a laser beam and usually followed by a analyser which is another polarizer filter. The beam intensity out of the two filters depends on the angle between them.

Polarization Filter

Polarization Filter

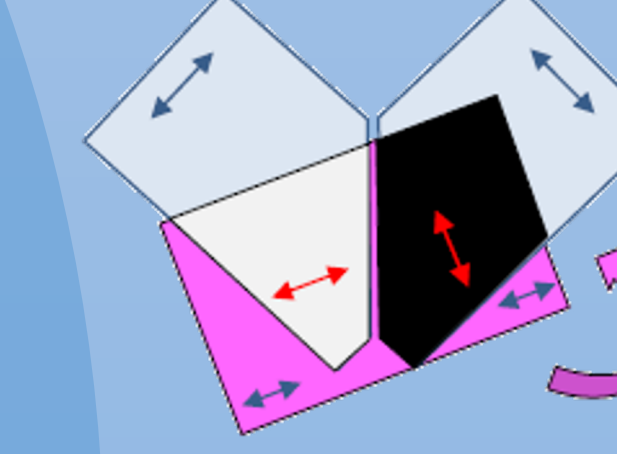Split Image Showing Malus Law 45⁰ Light Transmission
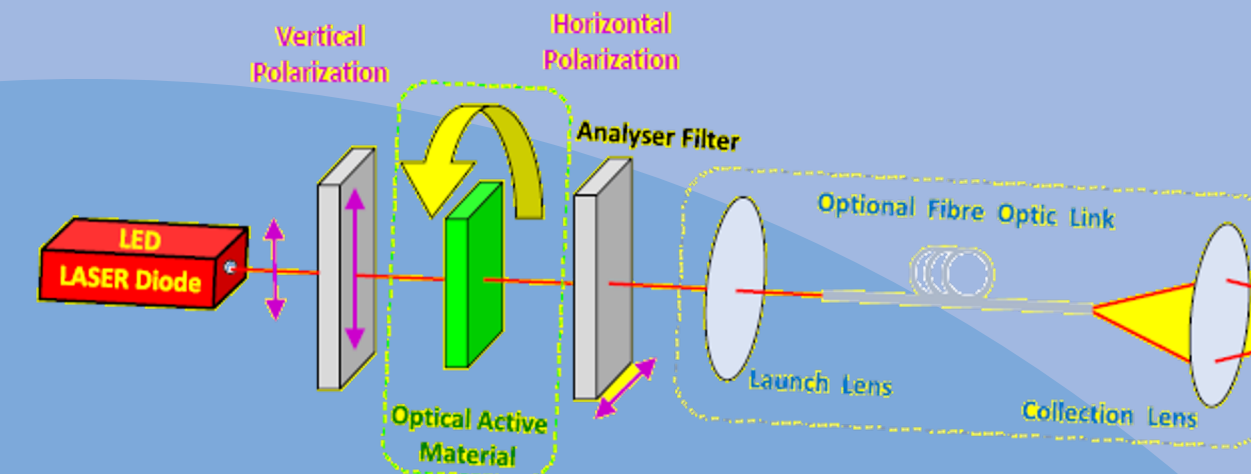
When to Amici Prism is rotated, one of the split image direction of Polarization will Increase in intensity, while the other split image direction of Polarization will decrease in Intensity, as the sensors detect increase / decrease in Light intensities according to Malus Law intensities.
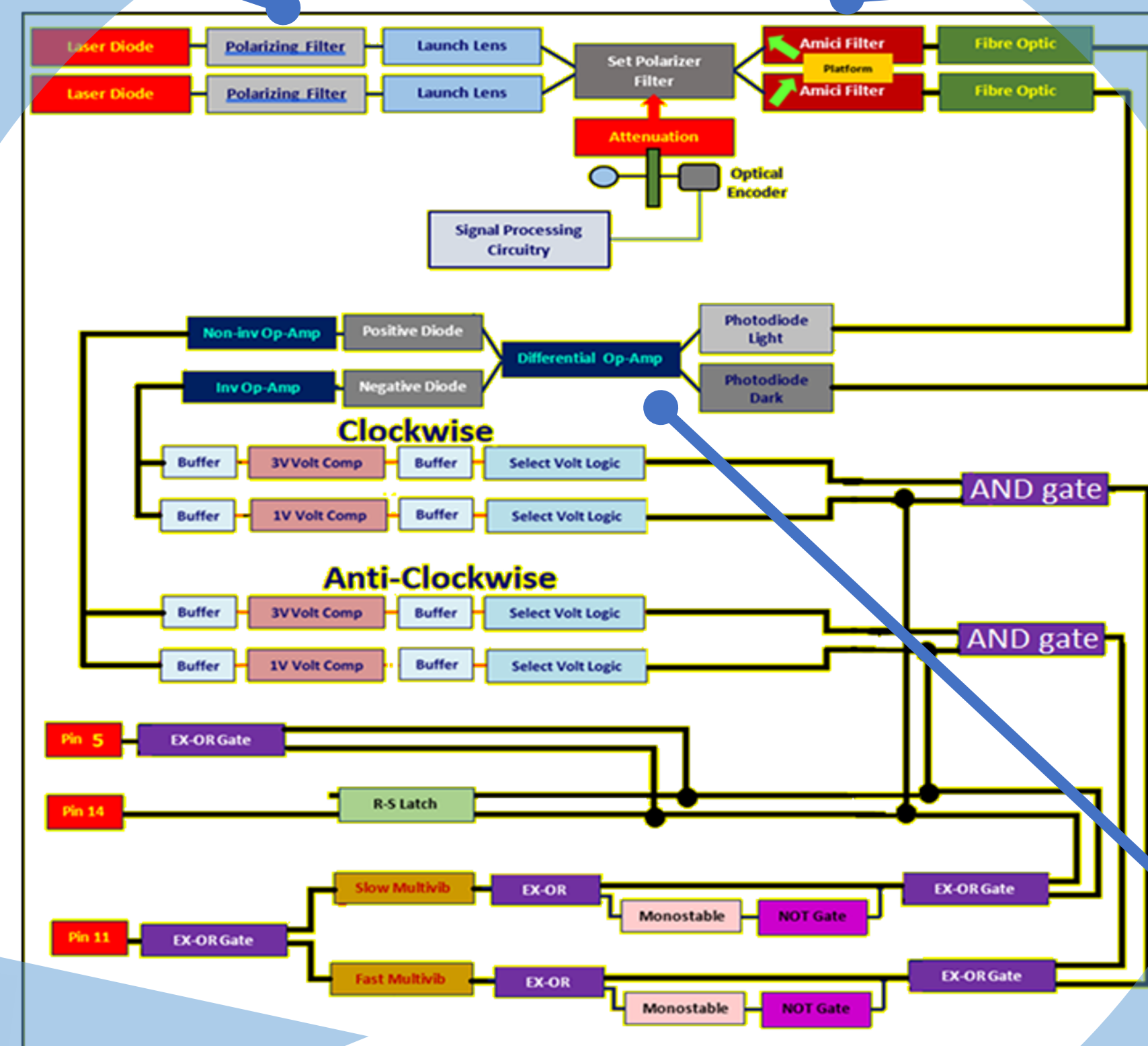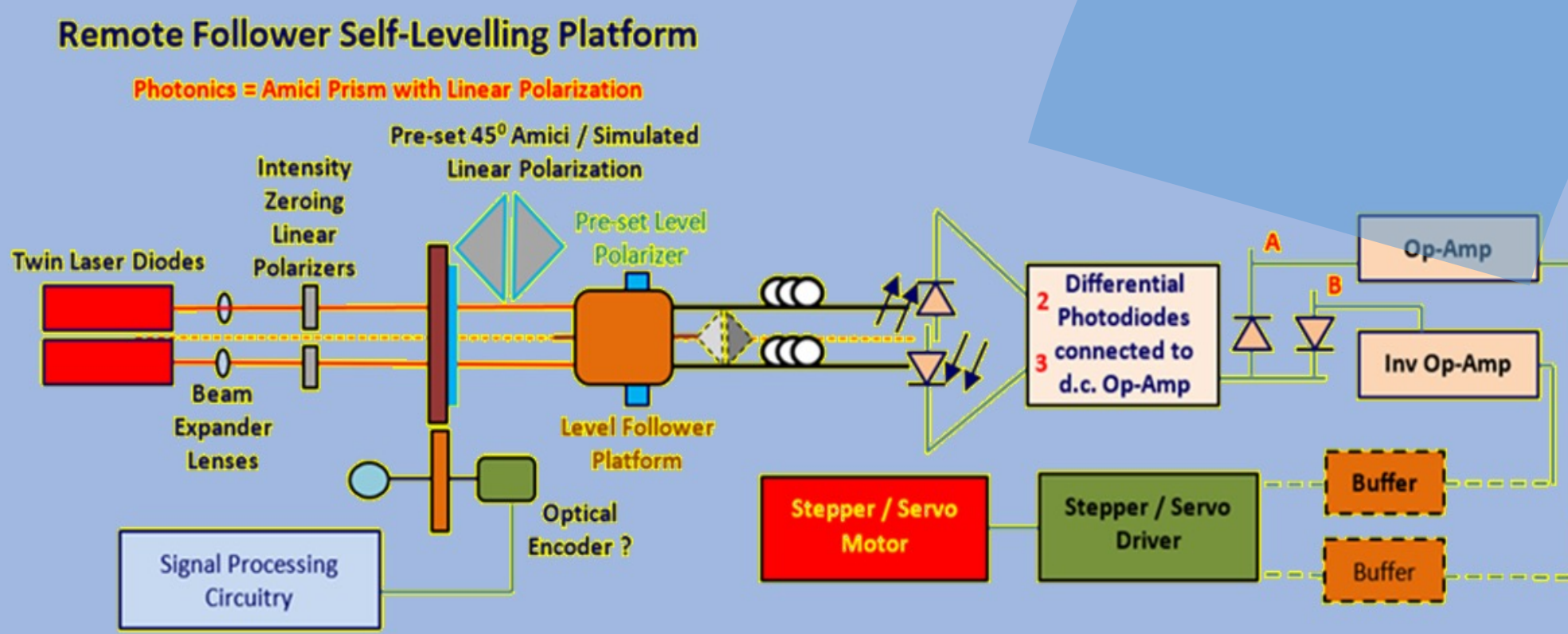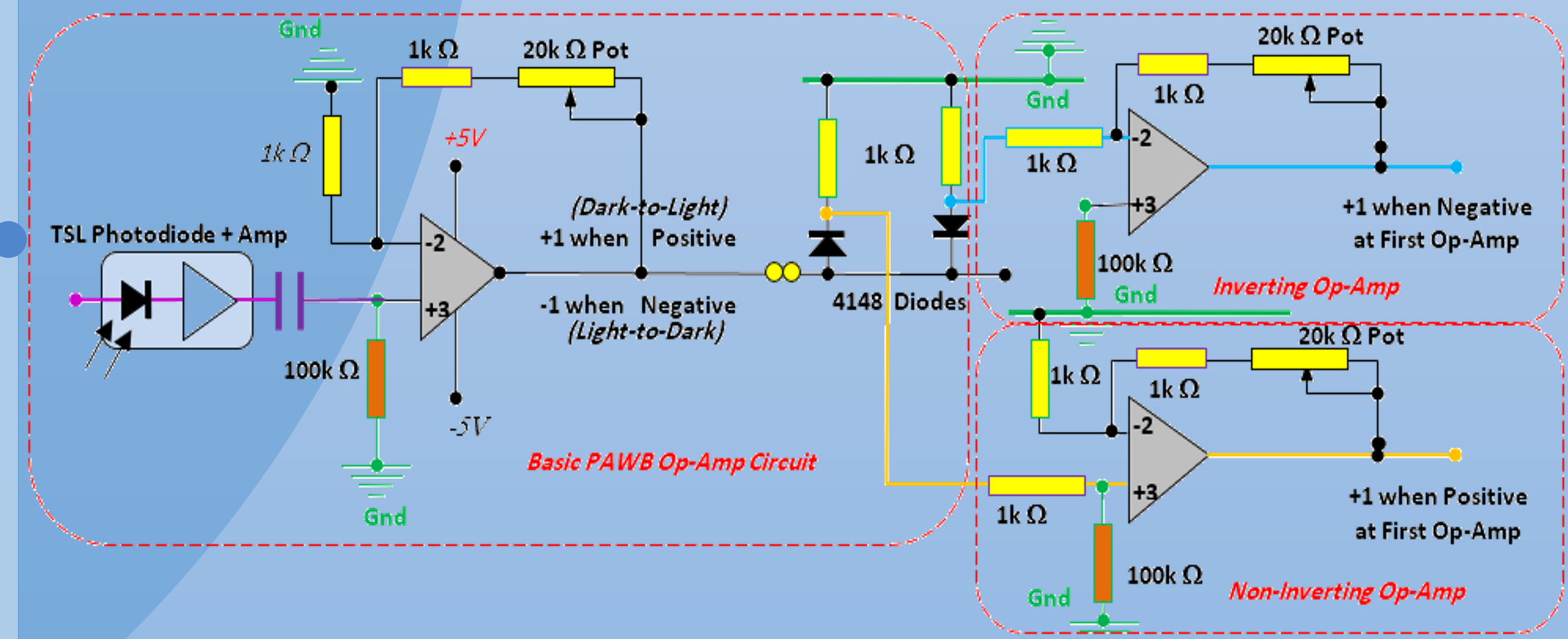
Split Image Showing Rotation of Roof Prism CCW
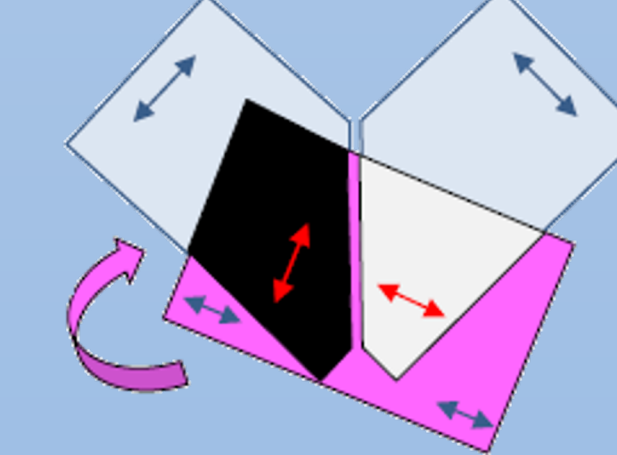
Split Image Showing Rotation of Roof Prism CW

Project Concept

Remote Follower Self-Levelling Platform

The Hardware circuit
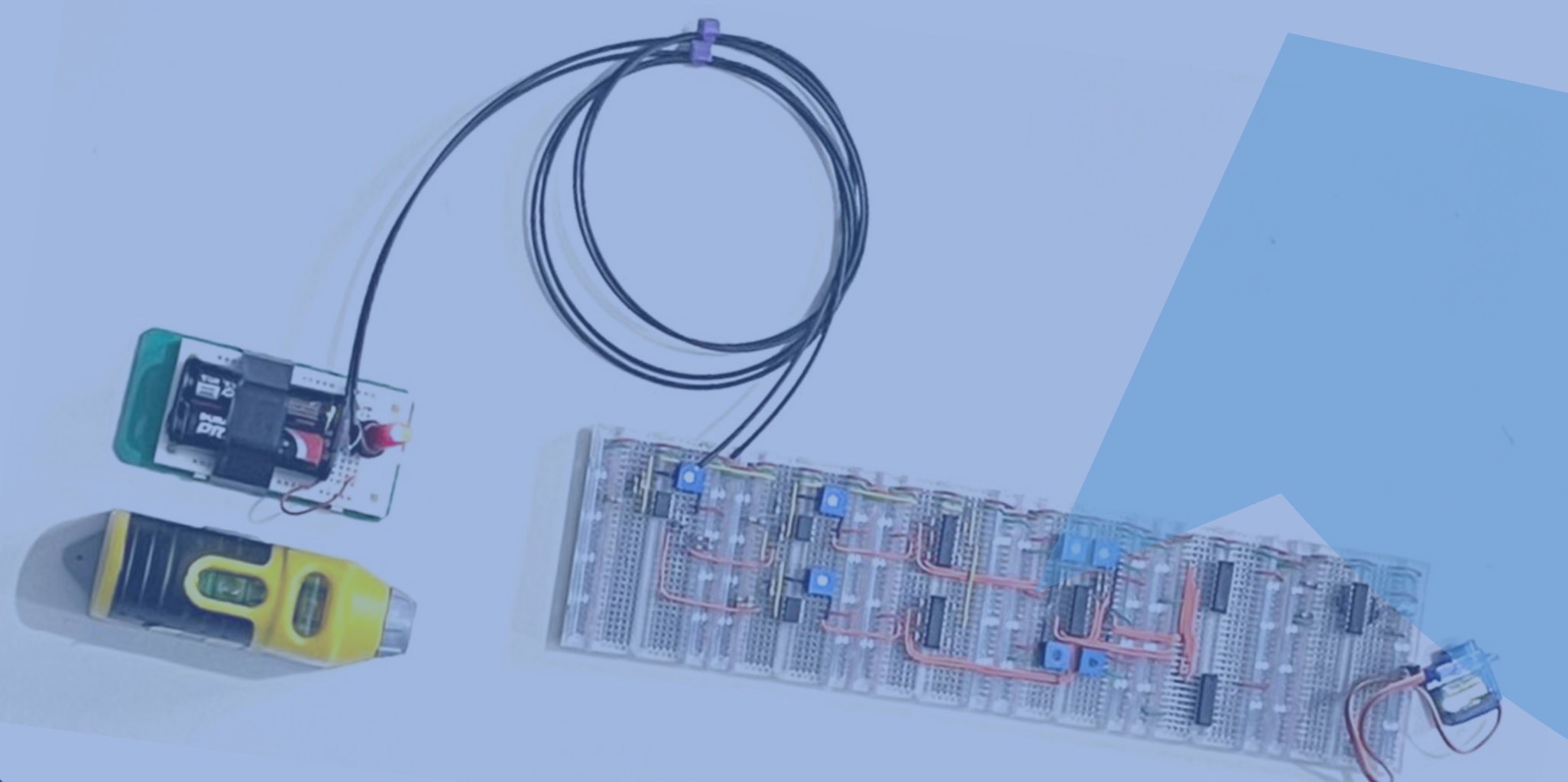
Operation

The operation of the project hardware is based on laser beam as input and the interfaces and the attenuation are though polarizer and amici prism then the interaction is done through an electrical circuit that converts the optic signal to electric signal and process the voltage levels and based on that a proper action is executed rotating the stepper motor.

The op-amp amplifiers implementation

References

[1] I. R. D. and, "PAWB≡DELTA Communication Initiative Tutorials," Photonics Academy of Wales @ Bangor (PAWB).