

Investigating the concept of a Rapid deployable Monitoring unit for Landslips on rail networks



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1 - INTRODUCTION

Landslips and train tracks are something that doesn't hit the head lines daily, but when they do the results are devastating!

The UK has some of the most busiest train networks in the world, and one of the oldest train networks in the world also, which brings hazards such as unstable civil infrastructure.

This project investigates the concept of a rapid deployable landslip monitoring system.

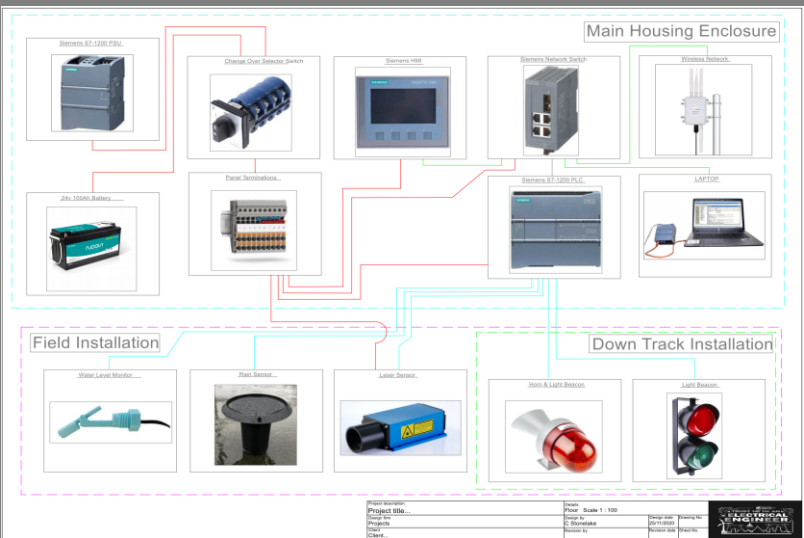
2 – Project Aim

Research, understand, Design and build a proto-type rapid deployable monitoring system to prove the proposed concept is feasible.

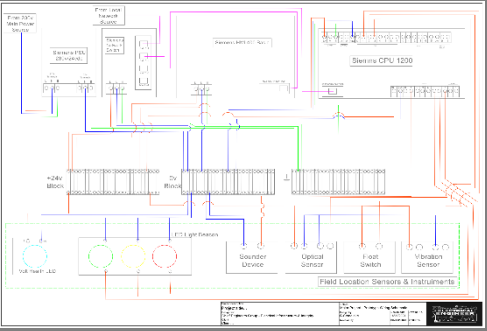
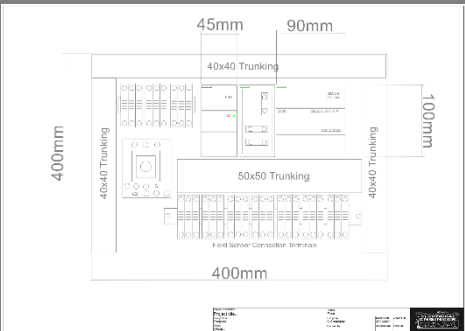
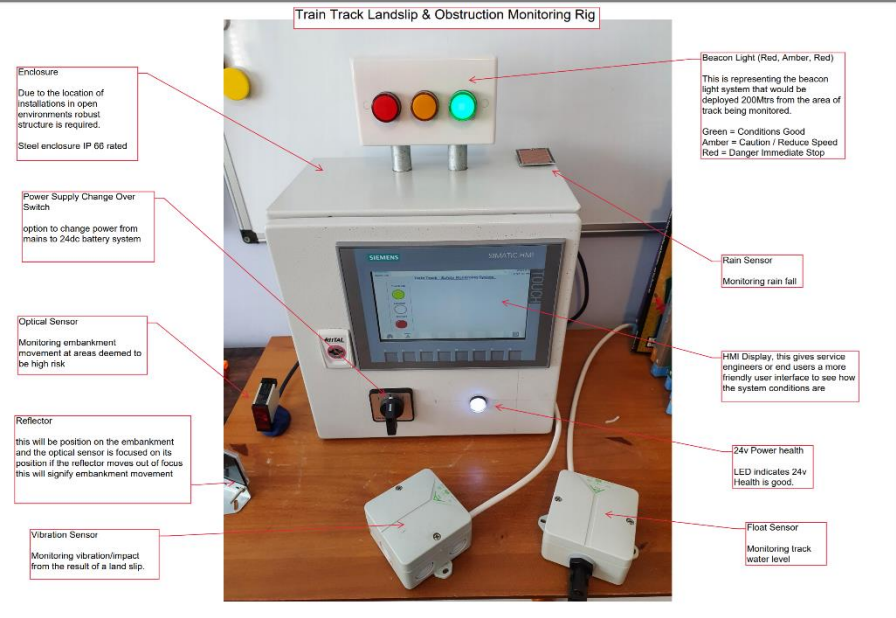
3 – Objectives

- Research and review literature and engineering studies on landslip monitoring techniques
- Review & scrutinise hardware, instruments and control systems
- Build a working prototype
- Develop PLC software to operate the system
- Test and evaluate
- Review and improve

4 – Concept Design to Built Prototype

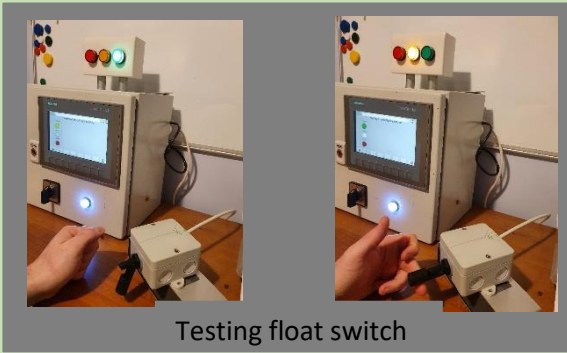


The 'rapid Deployable Monitoring Unit' was designed but not limited to – Monitor land slips via (optical sensors), Vibration VIA (Vibration sensors), Float switch sensors (water level), rain gauge sensor (rain volume sensor)



5 – Test & Analysis

Testing of the prototype consisted of triggering monitoring sensors such as the optical sensor, vibration sensor float sensor and the rain sensor to get the desired response from the unit



Activated Light	Flashing/Solid	Sounder Active	Status
Green	Solid	No	No Warnings, track Okay
Amber	Solid	No	Proceed with caution
Amber	Flashing	Yes	Reduced speed and proceed with caution
Red	Solid	Yes	Stop immediately

Track LED Light Beacon (Warning Notifications)

Due to the number of different sensors that could be monitoring the track section, inputs into the monitoring system from the field sensors could be from mild (non-serious) conditions too hazardous (life threatening) conditions.

Below is listed the possible light beacon status which could be present and for train drivers to act accordingly.



6 - Conclusion

Over all the project has proven that a rapid deployable monitoring unit for landslips is very feasible.

The parts and components used are industry ready available, and have proven track records in performance and reliability.

Having the ability to get an area of unstable landmass to be fully monitored within a 48hr period is the unique feature of this application along with the direct on site warning system via the light beacons and audible sounders.

7 – Further Developments

- Renewable power sources
- Integration of signal code generators
- Proving of EE 4g/5g networks

Field testing to Test and prove Sensor optimal Positions to Ensure best results and optimise performance

