Scuola universitaria professionale della Svizzera italiana
Dipartimento tecnologie innovative

SUPSI

Study of a system for the absolute position measurement

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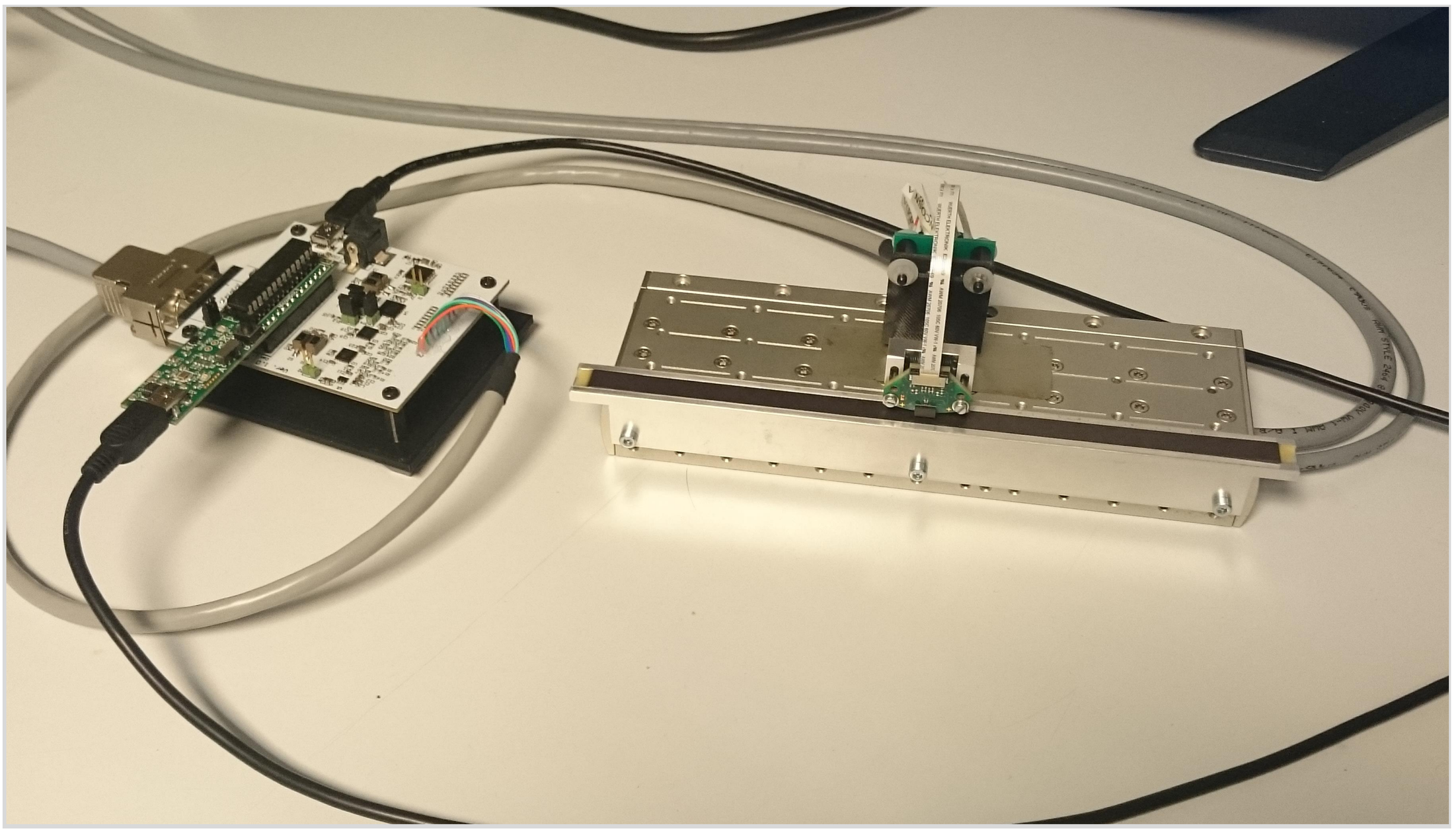
Degree course	Module	Year	Date
Electronic Eng.	C09916	2018	02/09/2018



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Abstract

The purpose of this bachelor project is the study of a solution for measuring the absolute position through a magnetic sensor. Initially, the problem was studied in order to find a solution that could satisfy all customer requests. Once the most suitable was found, tests were carried out to verify its feasibility. In order to avoid having produced an unusable system, it was decided to support an alternative solution during the testing phase and,
besides this, verification systems were added to demonstrate the quality of the results with measured data. Topics such as the analysis of the problem, the measures taken, the design of the system in all its parts and finally the results of tests will be discussed.

Goals

- Development of a linear measurement system for at least 110mm way.
- Contact-less sensing unit.
- Absolute measure.
- Repeatability: 10 um.
- Reach maximal air-gap between sensor and reference scale.
- Technology: TMR (Tunnel Magneto Resistive), Nonius.
- Sensor: TL915.
- Measurement range: 90 mm to 110 mm

Conclusion

The project has lead to a working system that permit to measure and evaluate the precision of a TMR sensor. Many difficulties have been found due to the main component that has been on the market for a few months. Overall results obtained are included in the parameters defined by the project specifications and lay the foundations for the development of a system to be used by the final customer.