

# Encoders; opening doors to the future

*Authors: Emanuel Edelstam & David Petersson*

**Automation is becoming a staple in today's society, integrating into all parts of our everyday lives. One such implementation is in automatic doors, which calls for a connection between the physical world and digital systems. For safe and accurate operation, precise feedback from the system is crucial, which has resulted in a high interest in the field of encoders.**

Efficiency and affordability are buzz-words that immediately catch the attention of any manager looking to develop their business. To achieve these goals a constant evaluation and development process is usually needed to keep up with a world that doesn't wait for anyone. Automatic doors are crucial for efficient operations and smooth logistics, which is a pillar in modern industry. High-speed doors are often used to provide separation between rooms and climates while allowing for smooth flow of people and vehicles.

In this Master thesis a cost effective encoder for high speed doors has been developed in collaboration with the company ASSA ABLOY Entrance Systems.

An encoder is a term used for a wide variety of sensors used to measure motion and convert it to electrical signals. They're used in most automatic systems from a car's cruise control, to industrial robots and automatic doors. Encoders are crucial in automatic systems and therefore in modern industry and logistics as well.

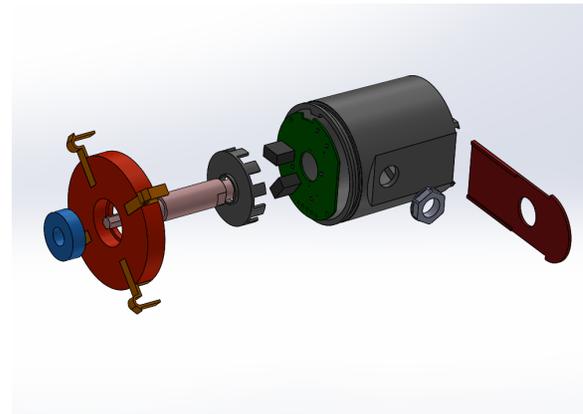


Image: An exploded view of the developed encoder.

The encoder developed in this project will replace the company's current one which is both expensive and uses a lot of resources.

By testing different measurement techniques ranging from optical sensors to mechanical and capacitive sensors a prototype was developed that uses optical sensors to measure the speed of the door directly on the motor, allowing for higher accuracy when measuring the doors movement.

In conclusion the new prototype, if produced at full scale has the potential to cut costs as well as giving ASSA ABLOY greater control over their value chain while still keeping their high speed doors safe and reliable, opening new doors for further success.