



1 Actuated door seal, controllable via tablet computer

DOOR SEAL INTEGRATED INTO BUILDING AUTOMATION

Fraunhofer Institute for Microelectronic Circuits and Systems IMS

Finkenstr. 61
D - 47057 Duisburg
Phone +49 203 37 83-0
Fax +49 203 37 83-266
www.ims.fraunhofer.de

Contact
Michael Bollerott
Phone +49 203 37 83-227
vertrieb@ims.fraunhofer.de



Importance of air quality

With the aim of higher energy efficiency modern buildings are becoming increasingly airtight because better windows and construction materials provide effective insulation. On the other hand, air quality is often not taken into account in the process. When considering criterions for a comfortable working and living environment, many people think of the room temperature. However, the relative humidity and especially the amount of CO₂ in the air are also important to maintain comfort and concentration.

Actuated door seal application

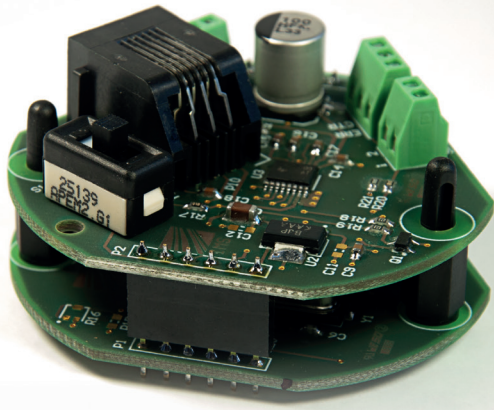
Some modern buildings are equipped with ventilation systems, often with incoming air in the rooms and outgoing air drawn from the corridors. When the doors are closed, the airflow passes by the door gap below. However, especially in working areas, most doors have automatic door seals for effective sound insulation. A new electrically actu-

ated door seal can now include both characteristics in one appliance. It can be used wherever there is a need for airflow between rooms without manually opening the respective doors, e.g. in meeting rooms, schools or hotels. Further applications include pressure equalization while operating doors in airlock situations.

System overview

Together with our partner Athmer oHG, a specialist for automatic door seals, Fraunhofer IMS researchers have developed a comprehensive system dealing with this multifunctional door seal use. A standard automatic door seal, usually lowered mechanically while the door is closing, is now actuated by a motorized mechanical unit similar in shape to a lock casing. This layout allows operation even if the door is closed.

An in-wall mounted electronic unit controls the motor and offers an interface to the building automation. Therefore it is equipped with a bus system and can logically be connected to the ventilation system and air



quality sensors. The software implements a demand-controlled ventilation algorithm. The door seal activation is synchronized with the status of the ventilation system. Thus the door seal is raised when the ventilation is activated. A visualization of the air quality and status rounds up the system. Thereby interested users and technical staff will receive feedback. Users can access the algorithm parameters with an easy-to-use user interface.

Features

The Fraunhofer IMS developed a electronic control unit and integrated building automation solution which includes:

- motor control with safety stop mechanism
- interface to KNX bus system
- manual override for testing
- 24 V DC or 230V AC power supply

- standard flush-mounting dimensions
- plug-and-play connection to motor unit
- demand-controlled ventilation using CO₂ sensors
- synchronization of ventilation system and door seals
- visualization of CO₂ measurement trends
- visualization of door seal and ventilation status
- adjustment of ventilation parameters

Fraunhofer IMS expertise

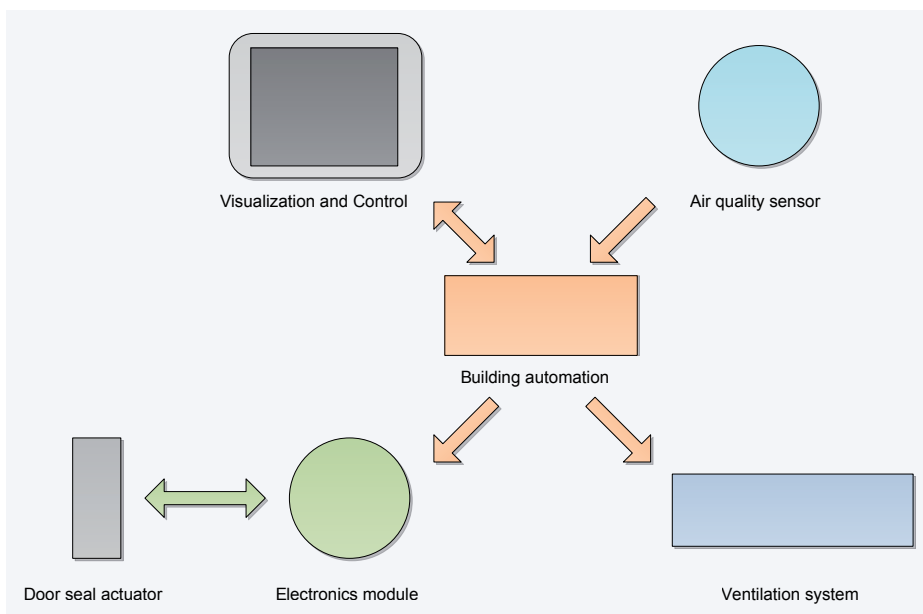
In the field of »Ambient Intelligence Systems« the Fraunhofer IMS offers the following competences:

- innovation consultancy
- concept and feasibility studies
- prototype and pre-production development
- technical tests and application evaluation

The content of our expertise comprises the following topics:

- integrated circuits
- sensor technologies
- embedded hardware and software
- integrated systems and software solutions

The Fraunhofer-inHaus-Center provides application laboratories for development and testing in realistic environments like hotel, hospital and residential buildings.



- 2 Electronics module with in-wall mounting form factor
- 3 System overview with building automation integration