VITECTOR
FRABA

WIRELESS DOOR
THE OEM SOLUTION

4 Door Control

1 App for
Smart Devices

2 Sensing Devices

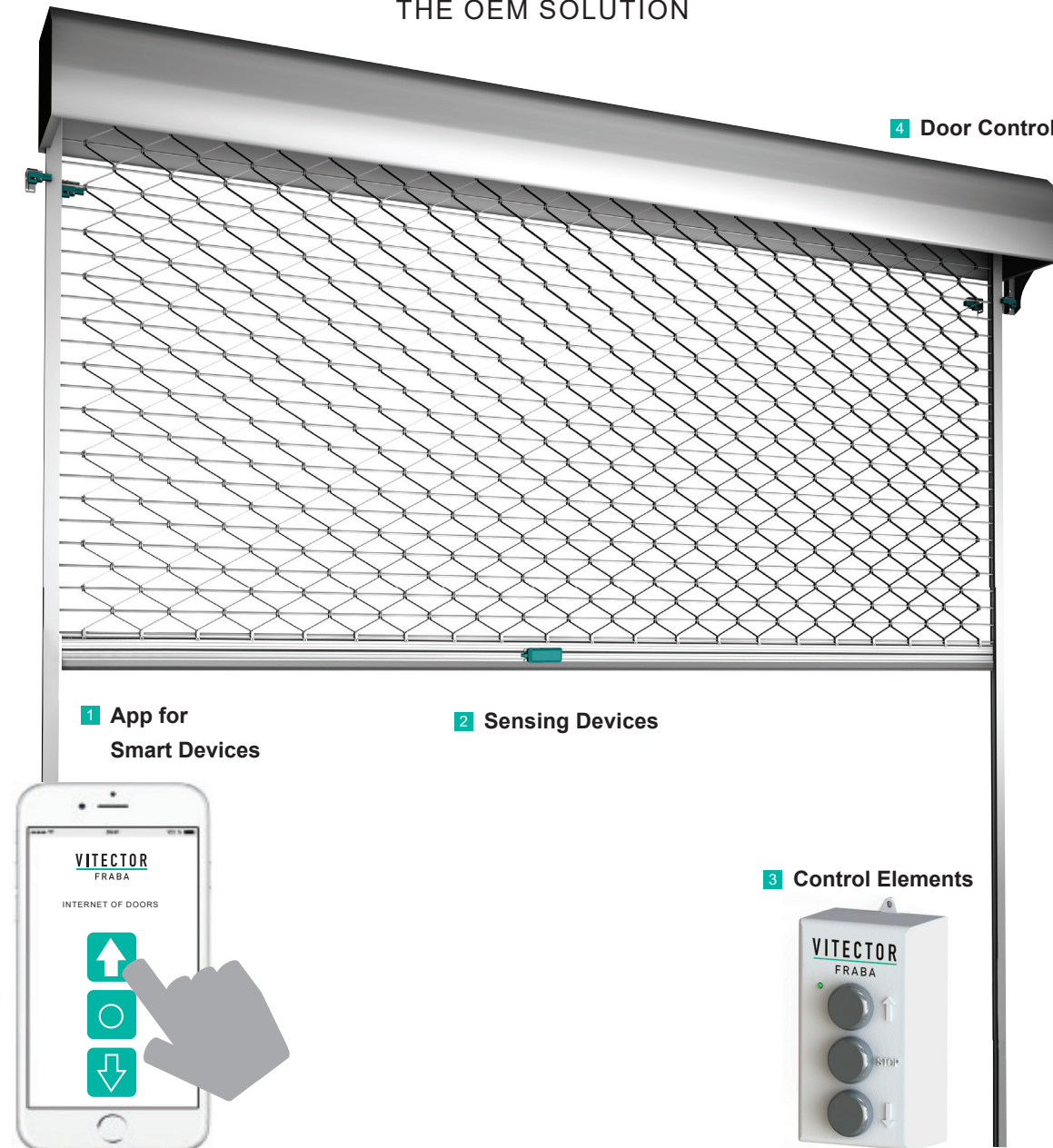3 Control Elements

1 App for Smart Devices
An app on a wireless data transmission capable smartphone or tablet can be used to control the door, provide live diagnostic data, status information, visual maintenance and repair instructions.

Features
- Door Control and Settings
- Failure Diagnosis and Maintenance
- Access to the Cloud
- Data Mining

Internet of Doors Portal
For a draft version preview of the Internet of Doors portal, go to: **www.internet-of-doors.com**
(UID: dhl; PWD: fraba-iod-2017)

VITECTOR
FRABA

SENSOR SOLUTIONS FOR DOORS

FRABA Group
FRABA is a group of enterprises focused on providing advanced products for the motion control and industrial automation markets. VITECTOR is a leading manufacturer and supplier of safety systems for the door and gate market in the USA, Europe, and around the world. The product portfolio of VITECTOR includes optical and pneumatic sensing edges, bumpers, and photo-eye sensors which meet international standards for safety devices. These products have applications in commercial, bus, and train doors as well as production machines. Other FRABA Group subsidiaries include POSITAL which focuses on rotary encoders, inclinometers, and linear sensors.

History
FRABA was founded by Franz Baumgartner in 1918. Until the 1960s, FRABA's main product was mechanical relays. In 1963 FRABA started selling "brush" absolute encoders and in 1973, one of the first non-contact, optical absolute rotary encoders was produced in the FRABA offices in Cologne. In 1994 the first optical safety edge was launched by VITECTOR. Today, FRABA companies specialize in innovative products that use advanced technologies to deliver exceptional performance and value.

Service
To ensure that customers get what they need, VITECTOR's development engineers in the USA, Germany, and Asia have direct responsibility for customer support. In addition, a growing global network of sales partners is providing expert guidance with knowledge about the local requirements.

Production
VITECTOR products are manufactured in advanced production facilities. The computer-guided, semi-automated production system tracks each device from order, through assembly and testing, to final delivery.
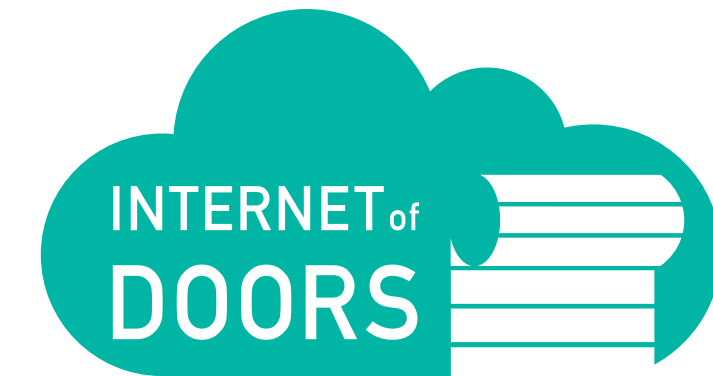
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VITECTOR
FRABA

INTERNET OF DOORS

INTERNET of DOORS

Bringing Doors to the Cloud

The Internet of Doors project of VITECTOR focuses on providing IoT functionalities for industrial and commercial doors. With the high number of installed doors, there is a significant need for retro-fit solution, which we offer with our Spyder Product Line. In cooperation with original equipment manufacturers our "wireless door" concept, with full data access to every door component, will achieve the best results and deepest analytics possible.

Features Spyder Products
- Retro-Fit Solution
- Central Database for Data Analytics
- Need-Based Maintenance now
- Predictive Maintenance with Big Data Algorithms
- Just-In-Time Spare Part Logistics and Service Dispatch

Features Wireless Door
- OEM Solution
- 2.45 Gigahertz Radio Wave Communication of All Door Components
- Deep Diagnostics on Component Level
- Need-Based and Predictive Maintenance
- Just-In-Time Spare Part Logistics and Service Dispatch

SPYDER
DATA & MOTION

Retro-Fit and OEM Solutions to Bring Your Door to the Cloud

WIRELESS DOOR
THE OEM SOLUTION

2 Sensing Devices

Sensing devices can be added flexibly to the system. Due to wireless transmission of safety signals, the wiring effort is minimized and installation costs are significantly reduced. The wireless module and batteries are installed in the junction box.

▶ Products
- Reflective Photo Eye (RAY-RT)
- Contact Edges (OSE)
- Pedestrian Door Switch (ENS)
- Safety Photo Eye (RAY)
- ....

3 Control Elements

Different control elements can be added flexibly to the system. VITECTOR offers 3-button stations or pull-rope switches with Radio Wave communication to control the door in the traditional way. A wireless emergency stop button can be added to the door control system for emergency shut-off.

▶ Products
- 3-Button Station
- Pull-Rope Switch
- Emergency Switch
- ...

4 Door Control

VITECTOR offers extensive know-how to support you in integrating a wireless module into your existing door control unit. By making your door control wireless, your customer will benefit from features like control via App and cloud access.
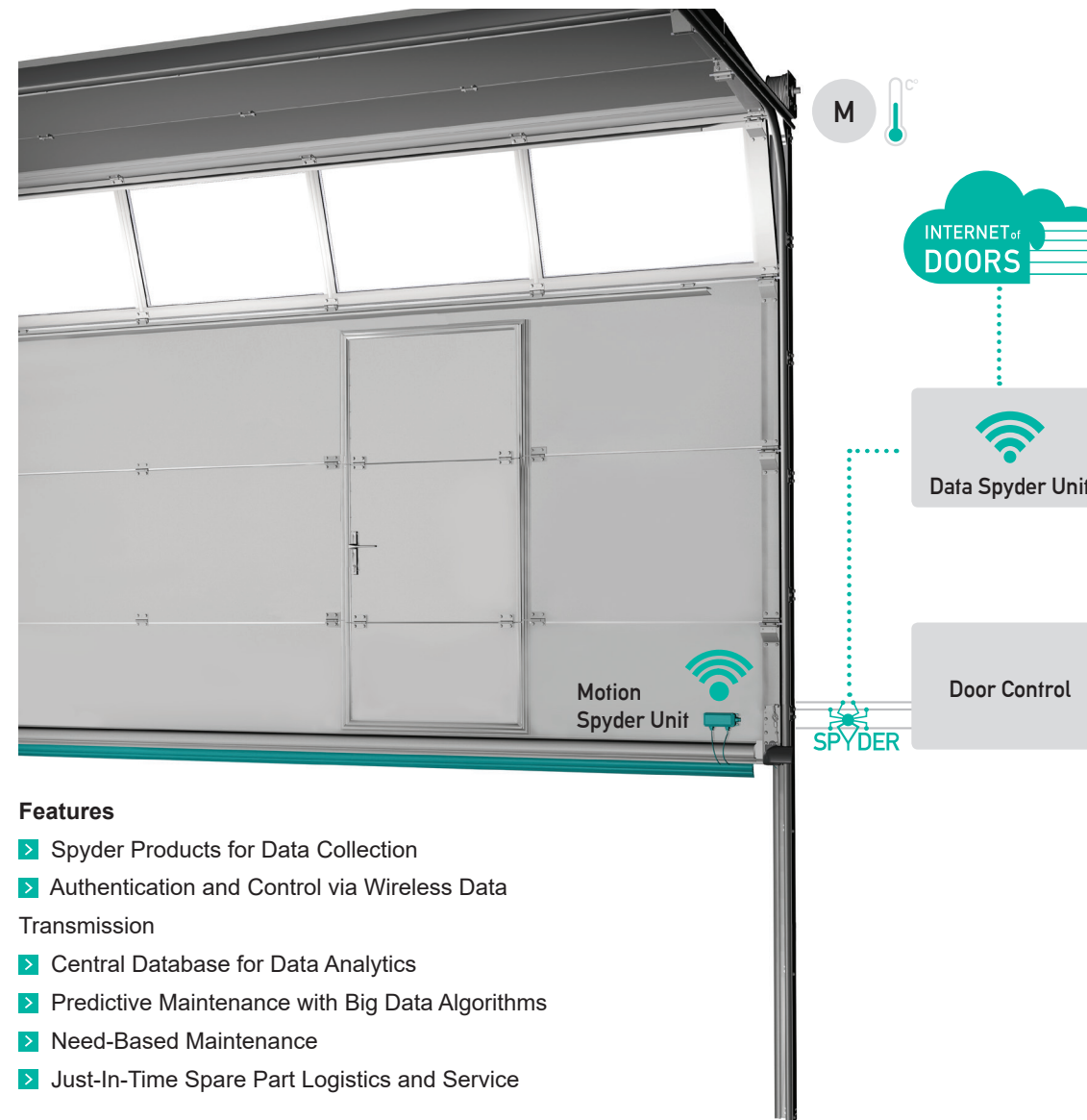
▶ Features
- Reduced Installation Cost
- Central Communication Unit
- Communication with Internet of Doors (IoD) Wireless Components

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SPYDER PRODUCTS
RETRO-FIT SOLUTION

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INTERNET of DOORS

Data Spyder Unit

Motion Spyder Unit

Door Control

SPYDER

Features
- ▶ Spyder Products for Data Collection
- ▶ Authentication and Control via Wireless Data Transmission
- ▶ Central Database for Data Analytics
- ▶ Predictive Maintenance with Big Data Algorithms
- ▶ Need-Based Maintenance
- ▶ Just-In-Time Spare Part Logistics and Service

Spyder Product Line

The Spyder Product family is one part of our Internet of Doors (IoD) solution – it allows you to keep track of your doors' operational status in real time. The IoD consists of the modules installed on site (Motion Spyder and Data Spyder with Communication Module) and the IoD Database server. For real-time information about status and performance of all your door systems, the on-site-modules are linked to the IoD Database. The IoD allows access to services, like

- ▶ **Maintenance Forecast**
- ▶ **Component Status**
- ▶ **Damage Alert**

The Spyder Product Line is a retro-fitting solution and with installation time of about 1h and approximate component cost of 200 EUR it is an inexpensive way to make your doors IoD ready.

The **Motion Spyder** unit is installed on the door panel and uses MEMS technology to measure the vibrations during door movement. The collected information is then transmitted via wireless data transmission to the stationary **Data Spyder** unit. Installed close to the door control unit and hard-wired to it, the Data Spyder collects additional information about installed sensor component status and also enables

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SPYDER PRODUCTS
RETRO-FIT SOLUTION

DATA & MOTION
SPYDER
DATA
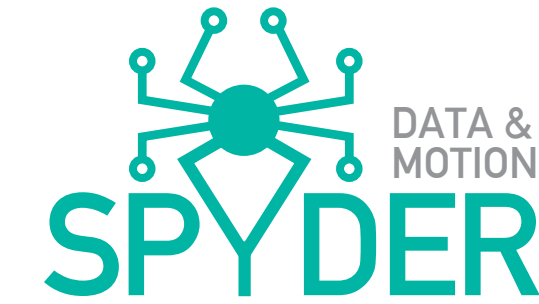
authentication of users for direct door control via Bluetooth. The Data Spyder has wireless internet connection capabilities to allow communication with the IoD database. By applying sophisticated algorithms on the collected data, it is possible to calculate a characteristic profile for each door and recognize certain events:

- ▶ Events:
  - Detect When the Door Hits an Obstacle,
  - Detect Vehicles Crashing into the Door,
  - Detect a Free-Falling Door
- ▶ Usage Profile:
  - Average Door Speed, Operation Time,
  - Cycle Counter, Peripheral Status
  - (Photo Eye, Sensing Edge, 3-Button-Station…)

The Following Services Can Be Offered:
- ▶ Need-Based Maintenance with Cycle Counter
- ▶ Event Notifications and Alerts
- ▶ Availability Calculations and Benchmarks

Big Data Possibilities

To guarantee traceability of your systems' performance and events, all data is stored in the IoD-Cloud. By collecting a growing amount of data, additional services will become available. These services are based on Big Data Algorithms, which detect regular patterns in the measured data and events. With the knowledge of these regular patterns, the system will eventually transition from need-based maintenance to predictive maintenance. For example, with a big dataset it can be possible to predict the break of a tension spring or a worn out roller.

Just-in-Time Spare Parts and Service

The IoD keeps track of all your door systems performance and status data. In addition to monitoring performance and status of each individual door, we can offer just in time spare part shipments and door service. Once an event has been observed or a maintenance threshold triggered, we will ship the right spare part for the service job and dispatch a door technician to get the door back into operation as quickly as possible.

Patents Granted and Pending

VITECTOR has applied for multiple patents in the Internet of Doors space:
- ▶ DE102015102405A1, US2016/ 0245009A1
- ▶ DE102014103456A1, PCT/EP2014076432
- ▶ EP3117628 A1, DE102015107416A1
- ▶ WO2016180556A1, DE102015111072A1
- ▶ WO2017005388 A1, DE102014118515A1

1 Maintenance Run Scheduled

2 Spare Parts Shipped

3 Scheduled Maintenance Performed

4 Door Operational