

## ■ Digitalisation and Lift Doors

UK

**Digitalisation continues to advance at a fast pace, thus increasingly changing the lives of people. While its implementation has become commonplace in some locations, corresponding changes are still pending in other areas. And that still includes lifts and their use to this day.**

This is likely to change very soon. The major players in the industry have been focussing on this topic for a while. They have already presented their concepts and will soon set new standards with digital performance. Medium-sized lift manufacturers will once again be called upon to take action.



Where is the component industry?

Lifts do comprise components but where is their intelligence and who defines it?

While this question can be answered with relative ease when it comes to standard products of a group, it becomes more complicated with special systems or products of medium-sized lift constructors.

So, what should the component industry be prepared for?

In the future, components will network with systems, wherever possible, and generate data. The evaluation of such data provides information about the respective product and forms the basis for improving performance and availability, for developing new products and services, and will result in new business models. Added value for operators and service companies may simply arise,

for instance, when a component supplies information about status and changes.

Function and reliability represent (only) the basic prerequisite, long-lasting mechanical components are expected as of the premium market segment. Mechanical systems without their own intelligence will not have a role in this development.

If a door manufacturer thinks about such things, it quickly realizes that the intelligence of a lift door is located primarily in the door controller. If a company believes in the above-described development, it will strive to redefine itself accordingly.

With its new development, the door drive concept MiD (Meillerintelligent-Drive), Meiller will make its first step in this direction.

### Broad application range with high efficiency

A controller in two different equipment variations and an identical transformer for all motor configurations prevents mix-ups and simplifies service logistics. This approach ensures that both brushless, frequency-controlled EC motors and DC motors can be controlled. In its new drive concept, Meiller utilises the latest motor technology, equipped as standard with a CANopen interface. Boasting high efficiency, these motors are considerably more powerful than all currently used motors. The range of these motors extends from 200 kg to 800 kg. In combination with these motors, it is possible to handle a very broad spectrum without almost any weight and size limitations. Meiller achieves this by means of synchronous technology, which entails the coupling of two motors with a controller to one door through to optical coupling of two drive units at landing and car doors. Doing so allows the operation of doors having a total door panel weight of up to 3.2 metric tonnes. All standard motors are offered with the IP 54 protection class, while special-purpose motors with up to IP67 are also possible. Drives for Ex Zones 1 and 2 are available.

### Energy intelligence – Standards redefined

From an energy perspective, the new door drive concept sets innovative standards. The two energy saving

modes ECO and ECO-Plus, which are available as standard without any extra charge, allow for switching off both the motor and the controller. Additional switches as in the past are no longer necessary. The energy saving mode ECO or ECO-plus is achieved by improving the recognition algorithms. As a result, the system uses no energy in standby mode and when the doors are closed and correspondingly less energy during operation thanks to the motors' greater efficiency.

Compared to conventional door drive systems, which are only able to save energy during the rest period, the company additionally focuses with its new door drive concept on the operational phase. While the previously known systems are only able to thermally transform surplus energy during braking, the efficiency of the door drive was demonstrably improved and thus heat loss was reduced here due to the modern processor architecture, a sophisticated energy management and operation-optimised motors.

The system's energy intelligence also allows of adjusting the energy consumption of the door's motor in relation to the outside temperature in order to ensure that the motor is ready to operate even at extremely low temperatures. The dynamic assimilation of motor currents transforms the excess energy in the motor into thermal energy. The motor is heated by means of additional current supply at extremely low temperatures and thus the system is kept ready to work. While the door drive systems that are currently common always operate with constant power regardless of the outside temperatures and require a separate transom heating unit for operation at low temperatures, the new drive system makes that unnecessary.

In addition to that, the controller provides sufficient energy for being able to actuate the electrically controlled interlocks. That eliminates the need to include a separate power supply for these interlocks.

### CANopen as standard feature

While door controllers nowadays are usually equipped with only one relay module and typically include a CANopen feature only after an extra charge, the new door drive already possesses this communication standard. Consequently, the customer is free to decide,

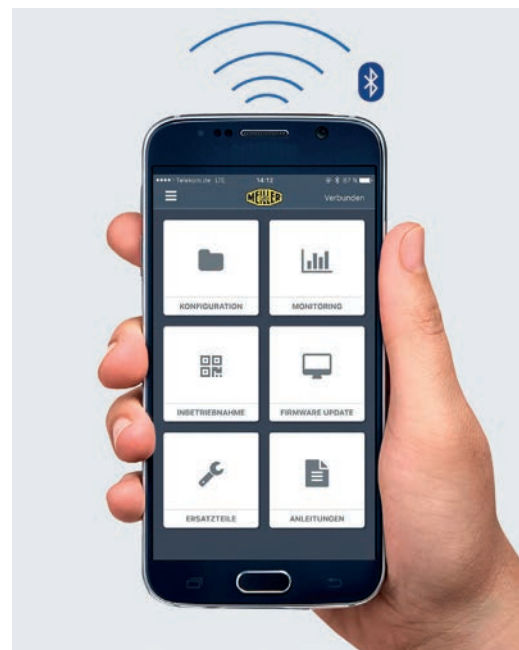
whether it wants to utilise CANopen for control purposes. Since both the controller with its own firmware and the controlled motors have CANopen, it is possible to have a major impact on the protocol. Every additional component is able to process the necessary information intensively and communicate with the door system.

### Standard arrangement for FingerGuard®

The new door drives will improve the FingerGuard® system, and the static pulse current brake is replaced by an intelligent control system as standard. Improvements are possible for the FingerGuard® product by expanding the controller, for instance automatic suppression of faults or manipulation of sensors and actuation via CANopen. Up till now, a pulse current brake with a static circuit was necessary, which only responded to every signal transmitted by the sensor. For operators, this means considerably smaller investments when equipping doors with this safety feature.

### Servo-assisted mode as standard feature

The servo-assisted mode of the new door drive system makes it possible to easily move heavy doors by hand by recognising and supporting this movement. This feature is extremely important in vertical and large horizontal doors. Like the power-assisted steering mechanism of a car, heavy doors can be moved with little force when need-



ing, for instance, to rescue individuals in emergency situations. Today's door drive systems are equipped with partly stiff motors that tend to further complicate the situation.

### Condition monitoring

Analysing the functional data represents the core of the new door drive. This data is logged in the internal memory for analysis. This makes it possible to record real life-time data. In turn, the collected data provides insight about usage and faults. They provide precise information about the door's status. The analysis of such data allows for monitoring the door drive system and recognises changes in the setpoint parameters. And this makes it possible to identify potential future failures. Thus, the general prerequisites for preventive maintenance are provided. Hardware components may be automatically identified for later updates with the aid of the operational parameter analysis. The statuses of lift car doors and the statuses of every individual landing door can be separately recorded and analysed by using the CANopen standard.

### QR code and app

Door actuation is simple and fast via a mobile phone app. Door drives are configured on site using defined QR codes for specific products and or-

ders. The door control system can be accessed on the basis of the order number. The lift door is assigned parameters that are adjusted to size and equipment configuration and adapted precisely to local conditions. Product-specific settings are possible in 22 profile parameters. Thus, the customer always has perfectly adapted operating profiles and the optimum settings for its product. This really simplifies and speeds up start-up without requiring any essential know-how.

In case of problems, service technicians are able to quickly and easily provide support with the aid of special service QR codes. Error codes are displayed in plain language via the app on a mobile phone. This makes fault analysis simple for everyone.

While software updates can currently be uploaded to door controllers only via laptops, this will also be possible via mobile phones with the relevant app at Meiller.

### Door control app in detail

The app is intended for use on both Android and iOS devices and is available in both the Apple App Store and Google Play Store. The connection to the controller is implemented by bluetooth without the user having to leave the application.

The radio link is started by using a button on the controller. After being inactive for a certain period, the link is interrupted with a corresponding message sent to the user.

Start-up is extremely easy with the app. The QR code is scanned using the search field of the camera. Subsequently, the data of the QR code is transferred to the controller and the teach-in operation started. Thus, the start-up is concluded.

At the user's request, the system checks whether there is a firmware update available for the controller. If this is the case, the user is able to decide whether to load the firmware file from Meiller's server and transfer it to the controller.

The app also includes the appropriate operating, installation and adjustment instructions. The last version that is downloaded in each case is also available as offline version.

The app can also be used to configure settings. The data from the controller are retrieved, modified via the app and

sent back to the controller afterwards. In order to create an external backup of specific settings, the configuration files can be sent via email and read again, if necessary.

The monitoring function makes a number of data available to the user, such as number of cycles of the door drive, motor temperature, life-cycle display of the door drive, controller type and firmware version, motor type and firmware version, warnings, etc.

The new app provides support to customers with regard to service and spare parts logistics. All door data is recorded by scanning the QR code via the search field of the camera. Afterwards, a photo of the respective part and a corresponding note by the user can be created. The appropriate request can then be sent to Meiller (including possible indicated cc contacts).

### Optical coupling of landing and car doors

The new door drive concept offers the opportunity to optically couple door controllers and allow them to communicate via sensors. The installed optics are used for an extensive protocol, in which the status of the respective controller is transmitted and compared. While one controller acts as "master", the other controllers are assigned the role of "slave/s" (master/slave control).

This provides alternatives to the classic skate system. As a result, it will be possible to "optically couple" actuated landing doors with a car door, in order to equip inclined lifts or horizontally moving systems with "simple standard components". The system is particularly attractive with regard to large and heavy freight lifts, which are equipped without any skate and hook lock and free of any deficiencies that could result in movements of the car due to load displacement. The possibility of minimising the sill gap by implementing such a concept provides leeway for other creative approaches.

With the door drive concept MiD (MeillerintelligentDrive) the company takes the first step towards the digital world and provides the basis for the future product portfolio, new services and strategic options.

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