



Smart motors on their way into the internet of things

Smart motors which include regulators, IOs, bus systems and control elements beside the motor, have been a parade discipline by Dunkermotoren for more than 20 years. They are the worldwide market leader when it comes to integrated BLDC motors. But lately the focus of motor manufacturers is shifting to the issue of “The Internet of Things”, asking the decisive question. Which meaning and requirements does the internet of Things have for motors? Dunkermotoren asks this question actively and is working on answers to integrate smart motors in the “Internet of Things”

There is no mistaking, that intelligent motors of the industrial automation, need to master Ethernet based field bus systems like ProfiNet, EtherCAT und EtherNet/IP, to control and communicate with other devices.

But the establishment of an additional parallel communication way, passing the controller and going straight from the field device into the internet, possible due IoT, is new.

The base for this way of communication is depending on the application either OPC UA, MQTT or AMQP. Dunkermotoren is already working on the integration of these two standards into their smart motors, to be prepared for the basic requirements of the IoT.

Beside the type of communication, it is also important to regard the way, the motor takes into the internet. For Dunkermotoren is IT safety and a simple network the most important requirement and sees the solution in the application of IoT Gateways. IoT gateways develop fast lately. When choosing the right model, their hardware already offers a reasonable IT safety. Their structure which is similar to IPC and the support of various communication standards makes them a variable platform. But Dunkermotoren sees further. As an alternative to IoT Gateways, provision is made for motor integrated IoT gateway interfaces but in particular





software gateways. These software gateways can be installed as container or sever client application on existing gateways from mechanical engineers or plant operators.

With this innovation, Dunkermotoren is targeting the need of many mechanical engineers and operators who don't want to use a separate gateway for every device manufacturer and instead using a single junction between device and internet. Dunkermotorens goal is it to offer the right gateway solution for every application.

Facing these conditions, Dunkermotoren could already implement a „Proof of Concept“, where a BLDC-Motor BG 45x15 CI in connection with a IoT gateway, could get connected to the internet, controlled and selected. To consider all possibilities for existing technologies BG 45x15 CI is using CANopen to communicate with the IoT gateway.

By using applications on the IoT gateway which can be handled with a web dashboard, the motor can get parameterized, several commandos can be send and the condition of the motor can be tracked live.

Furthermore, there is the opportunity to activate a real time measurement, which records the nominal current and the rotation speed using a time stamp. The recorded data is stored on the gateway and can get used for further analyses.

The IoT gateway is connected to the internet via WIFI and can get addressed device-independent via tablets, computers or smartphones. Due this web surface it is possible to communicate with the motor simultaneously. Complimentary to these features, Dunkermotoren added a messaging function to the “Proof of Concept”. This messaging feature is sending an alert via internet, if the current consumption of the BG 45x15 CI exceeds a certain threshold.

This alert is sent automatically to all devices which subscribed the status messages of the BG 45X15 CI, for example to the smartphone of the responsible maintenance employee. By applying the “Proof of Concept” Dunkermotoren proved, that it's possible to find edge solutions in the sectors of “condition monitoring” “preventive maintenance“ or „remote support“ even with already available devices. The remaining question is what the concrete advances of smart





motors and the Internet of Things is and where this way can lead to. Dunkermotoren wants to answer this question with the promising approach of a “device cloud”, a cloud in which all of the local motors can log in. The mechanical engineer or plant operator can regard and diagnose all of the active motors via this cloud. This opens up the opportunity for a free scalable and location independent remote support platform. Via device cloud it would also be possible to manage firmware and various software components centrally and transmit them to selected motors.

Furthermore, the “device cloud” can be seen as base for further digitalisation process, like the “digital twin” of motors, which offers additional services like the “predictive maintenance” for the customers of Dunkermotoren. The fundamental idea of this vision is the thought that every manufacturer focusses on their core competence in the future and offers not only data but already finished analyses to superior applications.

Let's take a look on the following prime example: Dunkermotoren analysis the “digital twins” of its motors via artificial intelligence and provides current information to their customers. Due to this the mechanical engineer can offer services like “dynamic service plans” or “just-n-time” spare parts to their customers. Focusing on preventing the unplanned failures of production plants.

As it is visible in the explanation, Dunkermotoren sees a big potential in the connection of motors with the “Internet of Things”. As proved in the “Proof of Concepts” they are prepared for further steps in this field, which will, depending on the feedback of our clients, actively carried on. We are pleased to support our customers as a competent partner and to find solutions for IoT applications in combination with Dunkermotoren. Because we are convinced that IoT is a topic area, which can only be solved successfully as a team.

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