

**Client**

Danfoss Drives

**Project**

Scalable platform for frequency converters

Danfoss Drives is a part of Danfoss, a Danish multinational company with more than 28,000 employees globally. Headquartered in Denmark, Danfoss is active in the manufacturing of components and engineering technologies for refrigeration, air conditioning, heating, motor control, and hydraulics used in off-road machinery. The company provides solutions for renewable energy (solar and wind), as well as district energy infrastructure for cities.

The company produces over 120,000 tonnes of food products annually, exporting over 85%.

## Making a generational leap of frequency converters

**Business growth demanded a more scalable frequency converter platform that would be still easily configurable by users**

Danfoss drives are top performers in heavy-duty industrial applications in industries such as marine and offshore, HVAC, mining and minerals, chemical, water and wastewater, refrigeration, food and beverage, cranes and hoists, and lifts and escalators.

Due to growth, Danfoss needed to develop a new generation of variable speed drive solutions for motion control and frequency converters.

Danfoss drives were already motor-independent, but the current generation of drives were tightly connected between hardware and application.

With the new generation of frequency converters, the aim was to create a common base platform that could serve a maximum number of applications.

Danfoss is a frequency converter hardware developer and manufacturer. For embedded and PC-software development they sought a trusted partner.

**Scalable embedded software platform for real-time control operation**

Proekspert was trusted with two tasks: to develop embedded software that could perform a real-time control operation of the frequency conversion and a PC software tool that makes upgrading and configuring the device possible.

The project's objective was to develop a configurable frequency converter platform that is adaptable for a variety of applications in different environments – so that the hardware and software would serve as many applications as possible.

For a more integrated cooperation, Proekspert joined the Danfoss Drives development team and began providing support with the design and development of software components.

We developed a scalable embedded software platform that operates drives in near-real-time. Danfoss Drives users can easily configure the platform and monitor operational condition and performance.

We are proud we did it efficiently by reusing the existing hardware platform and most of the software code.

**With the scalable application platform approach, Danfoss can focus on growth**

Danfoss Drives is a leading manufacturer of energy-efficient automation solutions. Their frequency converters are used in a growing number of applications. It's only natural that the company is constantly looking for ways to increase the modularity and scalability of its products.

The scalable platform allows Danfoss to manage its existing customers' growth, as well as service new customers. Danfoss customers can more conveniently configure, operate and monitor the operational conditions and performance of the drives.

The new platform approach helps Danfoss Drives be ahead of competition by increasing the custom configuration implementation efficiency, and bring the solutions to their customers faster.

**Impact for the customer business**

The Danfoss Drives frequency converter platform is scalable and built to meet the growing needs of the end-customer.

- The frequency converter configuration is time- and cost-efficient for the users.
- Operational and performance insight enables ensuring that the drives are working as expected. This prevents costly and potentially dangerous downtime in heavy-duty industrial applications.
- Danfoss Drives product development for various industrial applications is highly time- and cost-efficient.

*“Besides being highly skilled software architects, designers and developers, they also react very swiftly when critical situations require attention.”*

**Thomas Fogdal**

Embedded Software Platforms Manager,  
Danfoss Power Electronics

**Competencies**

High-level detailed design specification  
Project management  
Solution architecture  
System design  
Assembler programming – ARM, THUMB, AVR, x86  
PC software development – MS Windows MFC, Qt, Java  
UI development  
Testing and QA

**Methods**

Danfoss Standard Software  
Product Line Process Model  
Customer comment

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