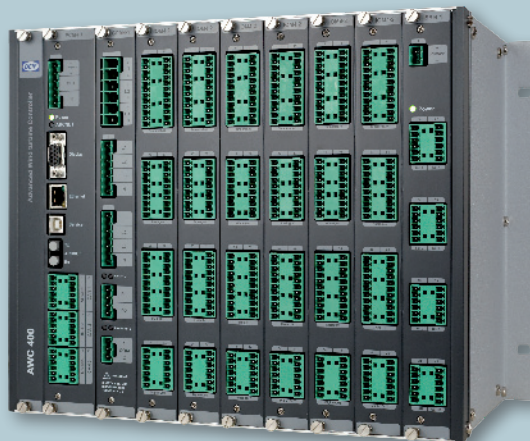**DEIF**

-power in control

WIND POWER TECHNOLOGY

Advanced Wind Turbine Controller, AWC series

Applicable for offshore or near-shore environments
Unrivalled robustness – 5-year warranty
Open programming in ANSI C/C++ and IEC61131-3

WIND

Advanced Wind Turbine Controller, AWC series

Engineered-to-application

The AWC series of controllers forms the hardware platform for pitch and main control solutions engineered to your application. Being engineered to your specific type of wind turbine, the AWC series is your guarantee of an optimised solution. DEIF possesses decades of accumulated know-how about the entire wind turbine and its control systems – this know-how is all utilised to customise the solutions to a perfect fit.

The AWC series offers distributed solutions providing maximum reliability at minimum cost. Placed near sensors and transmitters, an AWC reduces cabling, the risk of errors as well as the need for man hours during installation.

Open software development with Linux, C/C++, IEC61131-3 and MATLAB/Simulink

The AWC solutions are both ANSI C/C++ and IEC 61131-3 programmable and therefore very flexible. This means that you are free to either carry out programming and later optimisation on your own or leave it to us.

For C/C++ programming DEIF has tailored an Eclipse based development package and compiler toolchain providing 'one click' from project to running programme on the controller. You can choose to build your application based on DEIF's proven wind turbine application software, handling control and monitoring of main turbine components such as safety system, grid connection, electrical or hydraulic pitch system etc. The development package is compliant with Garrad Hassan's control strategy.

IEC61131-3 programming in Structured Text, function block diagram, etc., is supported on the AWC series controllers with the well-known CoDeSys PLC programming environment. DEIF integrates the entire HMI and PLC configuration in this open environment, making it straightforward to build a wind turbine application on the AWC series controllers.

At DEIF Wind Power Technology, we use model-based design and simulation with MathWorks MATLAB/Simulink as the foundation for developing and optimising our control strategy
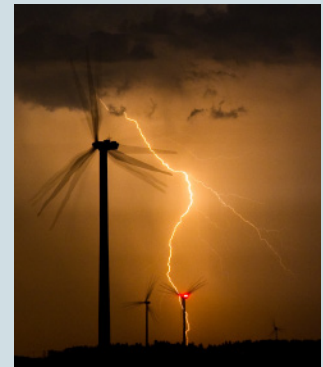
The AWC platform is designed to withstand electrical and mechanical stress along with extreme temperatures.
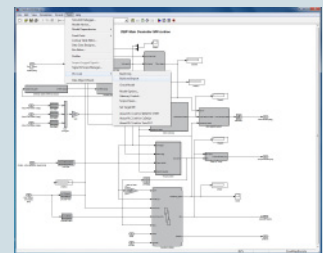
Model-based design of the wind turbine control system results in huge savings and better solutions.

PLC Link

- Translate Simulink® models and Stateflow® charts automatically into C code, IEC 61131-3 code as Structured Text

- Generate Garrad Hassan Bladed and FLEX5 compliant .dll files

- Build stand-alone applications and download directly to an AWC or a PLC – or generate code for implementation into existing projects

- Perform software-in-the-loop and PLC-in-the-loop testing

- Tune your system by updating parameters online using Simulink® or MATLAB® command prompts

- Support blocks using the standard Simulink® library

- Generate code from embedded MATLAB® blocks

- Include custom IEC 61131-3 PLC code in the code generation process
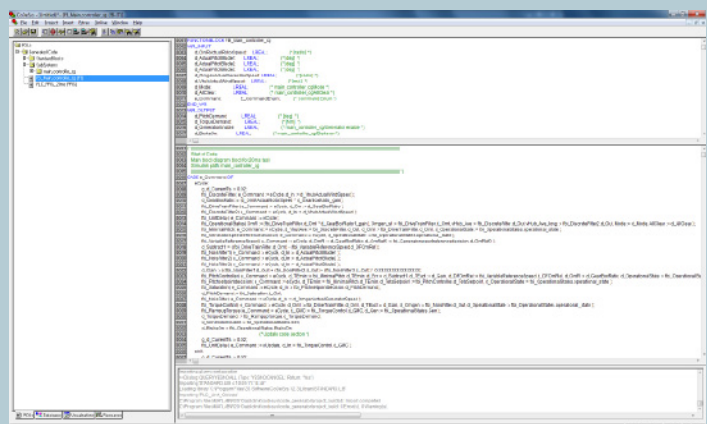
PLC Link auto-generates CoDeSys IEC61131-3 compliant code from MathWorks MATLAB/Simulink. This provides huge man hour savings and eliminates the risk of human errors.

Advanced Wind Turbine Controller, AWC series

algorithms, so that they perfectly match each individual wind turbine design. We use our in-house developed PLC Link software tool to translate a wind turbine control strategy design into C code and IEC61131-3 code (Structured Text) ready for integration with the surrounding wind turbine application software. The auto-generated code is flawless, eliminating the risk of human errors. At the same time, it is extremely fast compared to human programming – potentially cutting months off the duration of your project.

In the same workflow an additional toolchain generates a Garrad Hassan Bladed and FLEX5 compliant controller .dll file for wind turbine load verification.

Thanks to the developer tools available choosing the AWC platform minimises the time span from we agree on the specification to your solution is ready.

AWC 400.

Flexible and reliable hardware

Based on a modular rack concept, the AWC series provides compact, flexible and service-friendly solutions – right from simple plug-and-play rack modules to cabling fitted with pluggable connectors.

The AWC series is designed and constructed to meet the strict requirements for maritime use which exceed industrial norms by far. The maritime norms prescribe increased performance on several parameters such as EMC, vibration and shock resistance, temperature spanning, etc. On some parameters, the AWC series even exceeds the requirements from classification societies.

For instance, the AWC 500 operates from -40 to +70C° and can be stored from -40 to +85C°. The durability of the hardware is verified by HALT testing (Highly Accelerated Life Test) – the construction is designed for a lifetime of no less than 20 years. In other words, choosing the AWC platform equals choosing a hassle-free solution with a minimum of downtime.
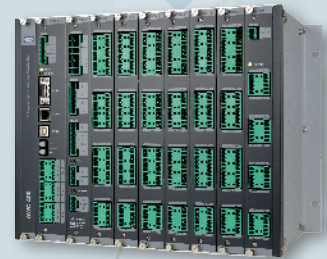
Developer tools

AWC series CoDeSys development package

- CoDeSys
- DEIF AWC series Target Support Package

AWC series C/C++ development package

- Eclipse IDE ready
- GNU C/C++ Compiler
- GDB Online Debugger
- DEIF Compiler Tool-chain (make files)
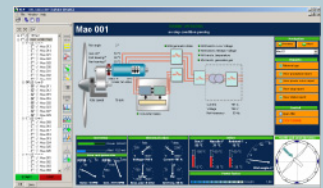- AWC series component and system setup

DEIF wind turbine control strategy:
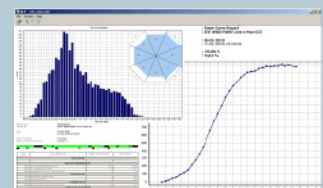- Control strategies for stall, DFIG, PMG, DDPMG turbines customised to clients

DEIF wind turbine application software package:
- Basic application software, customised to client wind turbines

SCADA

The SCADA system features monitoring of all relevant parameters and allows for full remote control of the turbine.

For enhanced overview, the advanced reporting tool of the SCADA system features graphical reporting.

Founded in 1933, DEIF offers our customers decades of accumulated know-how. Given the long history, our customers can trust DEIF to be a safe choice – we were here more than 75 years ago and we intend to stay.

The acquisition of the company West Control in 2004 was an important addition to the existing pool of know-how at DEIF. At the time of the acquisition, West Control had been supplying dedicated control solutions for wind turbines since 1988. The know-how of West Control was not limited to the control systems, but comprised the entire wind turbine.

Today, DEIF consists of two business divisions. DEIF Wind Power Technology develops/customises dedicated control systems to individual applications. The sister division, DEIF Power & Marine, supplies customised and standard power management systems, gen-set controls, switchboard instrumentation and marine bridge instrumentation.

DEIF is present worldwide through subsidiaries and distributors.

DEIF

- power in control

01.02.2011_A