



TargetLink:

Code Generation for Cabin Pressure Control System at Nord-Micro

For the safety and comfort of the passengers and crew in an aircraft, the air pressure has to be suitably controlled. Conventional cabin pressure control is done by the pilots themselves during the flight. In Germany, Nord-Micro develops and produces digital cabin pressure control systems (CPCS) that do not require any crew intervention. Software for airborne systems has to meet the highest requirements laid down by the European Organisation for Civil Aviation Equipment. "Level A" software was developed for this control system. TargetLink successfully generated C code for the demanding control tasks. From the release of the software requirements to the first running prototype, Nord-Micro needed only 9 months in comparison to 18 months without TargetLink. The first test flight program on an aircraft started in 2002 and serial production went underway at the end of 2003.

The CPCS ensures that all the safety and comfort aspects of cabin pressure are fulfilled. These requirements include:

- Maintaining the cabin pressure within the required limits
- Slow change of pressure rate in the cabin
- Adaptation of cabin pressure to the altitude of take-off and landing sites
- Protection against damage to the aircraft structure caused by too-great pressure differences.

The pressure level in the aircraft cabin is modified with the amount of air that flows in and out of the cabin. Fresh air enters the cabin continuously through the air-conditioning system, and the corresponding amount of air is let out through outflow valves, thus maintaining a certain cabin pressure. The valves change their flow-through diameter if necessary and determine the amount of air mass that exits the cabin. They are controlled by the CPCS.

Nord-Micro designed the cabin pressure control functions in a MATLAB/Simulink model according to the system requirements agreed on with the aircraft manufacturer. After the Simulink model was converted to a TargetLink model, both structural and functional tests were carried out on each individual software module. Thanks to TargetLink's extensive configuration capabilities and the technical consultation offered by dSPACE, even the most demanding tasks were solved.

The project ran smoothly, enabling Nord-Micro to generate efficient controller software in a very short time. Due to the achieved efficiency and quality TargetLink has become the standard tool for automatic code generation at Nord-Micro.

