In recent years hybrid electric aviation has developed into one of the most exciting technology drivers and innovation topics in aviation. Catalyzed by the increasing urbanization and population density of metropolitan regions as well as fast-paced developments in the field of electric drives, autonomous vehicle control, 5G communication networks and vehicle sharing services, new urban mobility concepts are emerging that incorporate the third dimension.

Both suitable technology concepts and thoroughly planning of the verification and certification procedures will be of strategic importance to be a successful market player and grow profitably.

Due to Vector’s many years of experience and competence in the development and testing of safety-critical systems such as flight controls and pilot assistance systems, many hybrid electric innovation leaders are already using Vector’s test and development tools.

Application Areas

> **Software Testing**
Automation of DO-178C and DO-330 compliant testing activities across the software development lifecycle of avionics systems

> **Software Analytics**
Monitoring of every type of software and systems development project

> **System Testing**
Realize development accompanying SIL simulations and HIL tests with parallel access to bus systems (e.g. CAN, ARINC 429, AFDX® and Ethernet) and I/Os

> **Smart Charging**
Support developers of charging stations and charging systems according to ISO 15118, SAE J2847/2 with extensive test systems

> **System Engineering**
Support the development of avionic system architectures according to DO-178C and DO-254 and their optimization for more efficient systems
Fact Sheet  Solutions for Hybrid Electric Aviation

Test Tools for Software Testing
VectorCAST/C++
> Automate C and C++ unit testing
> Pass/Fail analysis as well as code coverage analysis
> Supports DO-178C and DO-330

VectorCAST/QA
> Automate system tests and code coverage
> Coverage levels for statement, branch and modified condition/decision coverage (MC/DC)
> Supports DO-178C and DO-330

Square
> Software analytics and decision-making dashboard
> Manage quality, process and standard compliance

Test Tools for System Testing
CANoe
> Develop, test and analyze individual microcontrollers and networks of connected microcontrollers
> Supports engineers throughout the entire development process, from planning to system-level test
> CANoe Options for Aerospace: .CAN (ARINC 825), .A429 (ARINC 429), .AFDX® (ARINC 664), .Ethernet

CANoe4SW
> Development, test, and analysis of software in cyber physical systems

vTESTstudio
> Design automated test sequences
> Programming-based, table-based and graphical test notations and test development methods

VT System
> Modular test hardware for I/O interfaces
> Simplified setup of test benches and HIL test systems

Hardware and Software for Smart Charging
vSECC
> Communication interface between the electric vehicle, the charging and load management system and the power electronics for smart charging stations

vSECClib Family
> Software libraries for smart charging stations that cover the high-level communication

vCharM
> Charging and load management back end to operate charging points at high availability

Test Tools for Network Analysis & Stimulation
CANalyzer
> Software tool with Intuitive operation for analysis and stimulation of bus communication
> CANalyzer Options for Aerospace: .CAN (ARINC 825), .A429 (ARINC 429), .AFDX® (ARINC 664), .Ethernet

VectorCAST/QA
> Automate system tests and code coverage
> Coverage levels for statement, branch and modified condition/decision coverage (MC/DC)
> Supports DO-178C and DO-330

Square
> Software analytics and decision-making dashboard
> Manage quality, process and standard compliance

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