

Aerospace HASS Test System



Customer: Leading manufacturer of aerospace control units
Final Product: Aerospace control units for avionics, climatic control, landing gear control, etc.
Segment: MIL/ Aerospace

Description:

Generic universal test system for High Accelerated Stress Screening Tests (HASS) for aerospace control units or assemblies (LRUs, MCUs, boards). By using the KT climatic control software several environmental profiles can be simulated, depending on functional test sequences.

Customer Requirements:

- DUT interfacing via interchangeable adapters
- Aerospace voltage 115 V, 400 Hz
- Flexible DC and AC voltage switching to DUTs
- Stimulation and measurement of selected signals for error detection by using a PXI based test system; commercial off-the-shelf approach (COTS)
- Control of climatic chamber and shaker (HASS chamber), depending on test sequences
- Automated verification of all software and hardware parameters

Implemented Solution:

For quality assurance reasons under practical conditions, so called Stress Screening Tests are accomplished in the aerospace market. By doing this, DUTs are exposed to temperature cycles between -40°C to +85°C while shaking the DUTs along several axes.

Early failures and manufacturing defects will be detected with high certainty. The KT- High Accelerated Stress Screening Test System was developed as a standard solution for the aerospace industry and equipped with PXI instruments. These include a 7.5-digit multimeter, various digital I / O boards and multiplexers, CAN interfaces and extensive options for powering DUTs (AC and DC sources for all aviation relevant voltages).

Konrad equips this test system with the universal KT-Climatic-Chamber-Server. This allows running climatic profiles with correlated test sequences. Different climatic chambers by various manufacturers can be interfaced using plug-ins.

The comprehensive software package includes tools for efficient development and production ramp up. Within a short amount of time test engineers can use the KT SequenceGenerator software to automatically generate test sequences, based on requirement documents and test step templates. With KT-DEMA a library of interactive instrument panels are available, which can directly be integrated in the test program. The execution of test programs in production is done using the KT operator interfaces.

All test result data are stored in result files, compliant to aerospace standards, e.g. ABD0100. Furthermore, software tools such as KT-STAT are used for SPC analysis to simplify a continuous improvement of production quality.

A special feature of this test system is verification by means of a database for all test procedures. This includes the cross check of the test adapters with each DUT, all relevant test sequences, and parameters.

Software:

NI TestStand:	Sequential Control Editor, Debugger
NI LabVIEW:	Test Step Libraries
KT-OP:	User Interface Debugging
KT-Project:	Test Step Libraries Functional Test
KT-DEMA:	Interactive Soft Front Panels
KT-Sequence Generator:	Automated generation of test programs based on requirement documents
KT-Climatic Chamber SW:	KT Environment Server application
KT-Stat:	Result file analysis Process Capability Calculation

Hardware:

PXI-Based Test System with ABex® Extension	
Industrial PC as a system controller with an MXI interface	
NI PXI-1045 18 Slot Chassis	
MXI-Express Interface	
Instruments:	PXI-4071 7 ½ digit DMM PXI-6528 48-channel Digital I/O PXI-2527 32-Channel Multiplexer ME9000 eight port serial boards NI PXI-8464/2 two port CAN boards
Power Supply:	California Instruments AC Source Lx Series, 115V, 400 Hz, 4500 VA, three-phase Agilent N5746A, 0...40V, 19A, 760W Agilent N6700 Two-Channel 35V, 3A, 100W each UPS KT Power Supply Unit
Adaptation:	Exchangable fixture with Test Unit Adapter (TUA) and adapter encoding
Schnittstelle:	Virginia Panel with exchangeable adapters and reliable connections to over 20,000 mating cycles without exchanging contacting pins

Summary:

The KT High Accelerated Stress Screening Test System is a universal test solution for cost efficient test of typical aerospace LRUs, using commercial instruments. Specific aerospace requirements, such as the Airbus ABD0100 are supported.



Automotive +++ Avionics +++ Semiconductors +++ Telecommunication +++ Medical +++ Industrial