HENSOLDT
Mission Computing
Safety, Performance and Apps in true Synergy
Mainstream Solutions Delivering Airborne Functions

With increasingly tough operational requirements, aircraft mission systems are designed to become ever more powerful. Within mission computing safety critical and non-safety critical functions have to be developed and certified according to the highest safety standards. Development for certification is complex, time-consuming and costly. All this leads to limited means of configuration, flexibility and steers us to proprietary solutions. In order for end users to adapt to changing mission profiles they require a method of updating their mission computer in a fast and flexible way, even during an aircraft’s lifecycle.

The World of Commercial Electronics...

... allows end-users access to millions of applications. A large community continuously leveraging new ideas and innovation speed and offer individual solutions for customer needs. For almost every requirement there is a corresponding App, easy to get access and easy to use. Further advantages include short product cycles and ongoing development - off-the-shelf hardware - software components and support libraries - modularity - performance. However, in mission computing these advantages do not necessarily apply.

HENSOLDT Mission Computing - Fully Compliant, Plug-in COTS and Apps

End Users

Can now quickly and easily adapt their aircraft mission computers to new mission requirements during the in-service lifecycle of the aircraft just by adding new applications. To do so, they can reuse existing and proven applications or chose new, advanced applications from elsewhere.

OEMs

Can now apply commercial Windows/Linux software to the safety-critical environment of aircraft mission systems. Reducing the amount of safety critical software new mission applications can be developed faster and more efficiently. Non-safety critical functions benefit from a powerful multi-core processors and clustering technologies. In-service aircraft mission systems can be upgraded with relevant COTS (Commercial off-the-shelf) hardware modules without an entire mission system requiring replacement.

With HENSOLDT Mission Computing both commercial hardware and software can be embedded in a safety-critical airborne environment certifiable according to aviation safety standards DO-254 and DO-178C up to DAL B.
SAFE AREA hosts safety-critical functions like Digital Map or Terrain Awareness (both DO-254, DO-178C DAL C) and provides the interfaces to the aircraft avionics system.

APP AREA hosts Apps from the world of Commercial Electronics. These Apps implement specialized data processing functions incorporating sensor and cockpit data e.g. video processing, sensor data fusion. Apps run on commercial operating systems.

SEGREGATOR performs hardware segregation of both areas and intelligent software monitoring of the APP AREA. It prevents direct access from the APP AREA to the safety critical elements of an aircraft avionics system. Data such as computation results can be exchanged between APP AREA and SAFE AREA through a well-defined defined protocol. With this concept, new Apps can be developed independently from hardware and aircraft environment. Cyber resilience is integrated by security shell technologies.

Key Advantages
- Multi-core processor technology
- HD video and graphics
- High-speed interfaces
- Safe and secure
- Highly robust and reliable
- Optimized SWaP
- ITAR free
1. Configurable and Safety-Certifiable Computing Platform

The Computing Platform combines safety and high-performance characteristics within one equipment. It implements a complete hardware abstraction through pre-integrated platform software, ready to host selected safety-critical functions and customer furnished Apps to feature user requirements of an advanced mission computer.

Core Elements

| Hardware Building Blocks and related operating systems, drivers, board support packages, utilities | Flexible IO: certifiable and deterministic FPGA based interface solution |
| VITA 46 OpenVPX 3U standard modules | Safety-certification artefacts for hardware and software in SAFE AREA according to DO 254, DO-178C DAL C. DAL B on request |
| Customised form factors |

Operating Systems Graphic Drivers and Support Libraries

| SAFE AREA | APP AREA |
| Wind River VxWorks 6.9 or VxWorks 653 V2.5 | Microsoft Windows or Linux other OS on request |
| Graphics driver CoreAVI OpenGL SC 1.0 | App Development Kit |

Hardware Building Blocks

- Building Blocks from HENSOLDT and Curtiss-Wright catalogues can be integrated
- Catalogues include production ready Single Board Computers, MPSoc, Graphics Modules, Interface Modules, Power Supplies, etc.
- Integration of 3rd Party hardware components are available on request

Minimal configuration of a multipurpose Computing Platform

| Characteristics | Operating Systems | Hardware Building Blocks |
| Memory: min. 256 GB | SAFE AREA | SAFE AREA |
| Housing: ARINC 600 3U VPX | APP AREA | APP AREA |
| Weight: ~7 kgs | Linux | Single Board Computer with Intel Skylake Xeon 6th Generation Processor |
| Power: 28 VDC | | Solid State Disk |
| Environmental: -40°C - +70°C | | |
2. Mission Computer
The Mission Computer is plug-in ready and based on the Computing Platform configured to support advanced missions.

Optional Core Functions by HENSOLDT

<table>
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<th>Digital Mapping</th>
<th>Tactical Datalink management and control: Link 16, VMF</th>
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<tr>
<td>Synthetic Vision System</td>
<td>Enhanced Tactical Information</td>
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<td>Terrain Awareness</td>
<td>Automated Sensor Data Processing</td>
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<td>Customer specific Apps on demand</td>
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Depending on the safety requirements of the aircraft, functions will be embedded in the SAFE AREA or in the APP AREA.

3. App Development Support
HENSOLDT provides full support for customer own software development within the APP AREA and SAFE AREA.
- App Development Kit
- App development training
- Integration support for customer furnished software packages

HENSOLDT supports customers with design principles to address specific configurations, e.g. redundancy concepts for mission computers.

HENSOLDT’s Mission Computer Paves the Way for Integrated Mission Sensor Suites

The Mission Computer can integrate all elements of a modern aircraft mission sensor suite in one device. Powerful applications can process and fuse sensor data with other information. This can reduce pilot and operator workload within mission related tasks allowing greater capacity to perform new, complex operations within networked environments (NCE).

Integrated and Fused Applications
- Sensor Steering and Tasking
- Sensor Exploitation
- Data and Information Fusion
- Image and Video Processing
- Pilot Assistance

The Integrated Mission Sensor Suite is just one tentative solution to enable new mission profiles. The Mission Computer can also allow you to fulfill your advanced mission requirements.

Contact Us
Years Experience in Mission Computing
For over 20 years HENSOLDT has delivered thousands of mission computing equipment, in operation on all major European military fixed-wing and rotary-wing platforms. HENSOLDT has the appropriate experience, cutting-edge technologies and capable partners to meet complex and sophisticated requirements of modern mission computing.