



Case Study: Low Magnetic Bridge System Computer

Background

Certain military applications require low-magnetic hardware to maintain operational security and safety. By minimising magnetic signatures, these systems avoid detection by magnetic anomaly sensors, prevent accidental detonation of magnetic-influence mines, and reduce electromagnetic interference with onboard navigation and communication systems.

The Challenge

Our customer required rugged, highly reliable, low-mag computers for a maritime defence application. As well as having a low magnetic signature, the computers had to have excellent thermal management, high EMC performance, and compatibility with a specific Linux operating system. The systems were also going to have to remain available for a long time, and deliver high performance computing with rich I/O.



The Solution

Steatite was able to offer a customised off-the-shelf solution which could be modified to meet these requirements while keeping production time and costs to a minimum. The result was the [LM-1000-CL](#) – a high-performance fanless embedded computer leveraging the power of an Intel CPU and 64GB DDR4 memory.

The system was reengineered to remove ~99% of ferrous metal therefore reducing its magnetic signature to a negligible level, and the Intel CPU meant that the request to run the specific Red Hat Enterprise Linux distribution could be met. Furthermore, specific firmware was applied to support the network card optical transceivers – these were fibre optics instead of copper to meet stringent security standards. An NVIDIA graphics card supported the requirement to drive multiple displays.

During our in-house pre-compliance testing program, our engineers identified one point of failure on radiated emissions which was found to be from the mini DP-DVI adaptor cable on the output from the graphics card. This was resolved by switching to an alternative adaptor cable. The customised PC delivered an extremely low magnetic signature, excellent EMC performance, and was rugged enough to support this specialised system even while operating in harsh environments.

High-performance Computing Tailored to Your Requirements

At Steatite, we have an experienced team of project managers, engineers and technicians who ensure that every computer that leaves our facility is designed, built and tested to perform against rigorous requirements.

Our customers have long trusted us to provide solutions for front-line applications, take a look at our [capabilities](#) and [contact us](#) with your custom computing needs.

