

# GRiD



## GRiD Defence Systems and AIM GmbH Collaborate on Military Aircraft Test Systems

### Project Background

AIM – a designer and manufacturer of high performance test and simulation modules – sought military-specification rugged computers that would integrate its data bus test modules for military avionics testing. AIM selected GRiD Defence Systems, and the two companies have now been teaming for over a decade to deliver reliable, high-standard avionics test equipment for aircraft and weapons systems.

### Project Requirements

Military aircraft avionics and missile systems have to perform to the highest standards under demanding conditions, and as such have to undergo rigorous testing to ensure that onboard systems are operating at optimum levels and running as required.

To test onboard systems, engineers use powerful data bus test equipment that will interrogate the systems and highlight any errors. This is often carried out by military personnel on the frontline, meaning that the test equipment has to be robust enough to function wherever the aircraft or weapon systems are deployed in the world.

AIM is a leading supplier of test and simulation equipment and has been selected by several aircraft manufacturers to provide modules that can analyse, simulate, monitor and test avionics to international data bus standards, including MIL-STD-1553 (the US Department of Defense's avionic data bus standard), MIL-STD-1760 (the DoD's weapons stores interface standard), STANAG 3910 and ARINC 429.

AIM sought a specialist rugged computer solution that could interface directly with an aircraft, and under a partnership with GRiD Defence Systems, AIM's modules have been integrated into the 19-inch GRiDCASE 1595 rugged laptop for a number of customers.

As a result, AIM and GRiD provide a fully-qualified, integrated data bus testing solution that interfaces directly with onboard systems – whether that is an aircraft or missile system – with reduced technical and Electromagnetic Compatibility (EMC) risks associated with multi-box solutions.



Together, GRiD and AIM have successfully delivered robust and reliable test solutions to air forces around the globe. This long-term relationship is a major benefit for the end user, with seamless integration of 'best in class' rugged computer designs, avionics interface modules, and advanced data bus analyser software for the human interface.

Future sixth generation fighters such as TEMPEST and the European Future Combat Air System (FCAS) that require even more advanced solutions than fielded today are both potential candidates for the team.

## Why AIM?

AIM is a trusted supplier of the German and UK Ministry of Defences, and as such has provided test equipment for leading fourth-generation fighter jets and other aircraft fleets, as well as missile systems. In order to provide an efficient solution to its customers, AIM sought to partner with a rugged computer manufacturer to deliver a complete solution.

For more than 30 years, AIM has served the defence and aerospace market, providing highly reliable and high-performance test and simulation modules, embedded interfaces, data bus analyser software, and customised systems solutions. AIM's specific area of expertise is with the design and manufacture of intelligent interface modules for testing, verification simulation and monitoring of data bus protocols/networks including MIL-STD-1553, STANAG 3910/EFEX, ARINC 429, AFDX/ARINC664P7, Ethernet (Up to 10G) and Fibre Channel.

The unique 'common core design' integrates multiple bus channels, onboard processing, time synchronisation and digital I/O, all on the interface level. Today's designs use the very latest FPGA and SoC (system on a chip) technology, which enables design consistency and the ability to port across to new host computer interface standards.

This coupled with a feature-rich application programming interface (API) module interface and data bus analyser software sets AIM apart as the supplier of choice for anything from an interface module to a complete systems solution.

AIM's Aircraft Ground Equipment (AGE) solutions are today based on GRiD's rugged computers installed with AIM data bus interface modules, as well as AIM's data bus test and analysis software known as PBA.pro.

This equipment, together with a bespoke cable set, connects directly to the aircraft enabling air force operators to perform pre-flight check-out and monitoring of the entire avionics system via the data bus interfaces. This means that no additional consoles or boxes are required, which reduces the requirement for extra cabling and power.

## Why GRiD?

GRiD is one of only a few manufacturers that can integrate AIM's data bus modules into its rugged computers, and its laptops are designed to integrate up to four of these powerful PCB modules. GRiD's position as an original equipment manufacturer (OEM) – as well as its in-house design and engineering expertise – has contributed to the development of rugged computers that are able to carry this number of cards while also meeting strict military ruggedisation standards.

All GRiD laptops are designed, manufactured and tested to meet demanding environmental standards such as MIL-STD 810 and Def Stan 00-35, which means they are able to operate in the harsh environments that militaries operate in. In addition, GRiD products are designed and tested to ensure they adhere to strict EMC standards and have low EMC profiles, which means they do not interfere with other aircraft electronic systems.

Other solutions often require the data bus test modules to be housed in a separate console or box, which needs additional cabling and electronics. This introduces EMC challenges that come with extra cabling, as well as requiring more equipment to seal to ensure ruggedness, more parts to maintain, and more technical difficulties and overall risk.

As GRiD's laptops carry all the necessary modules required for data bus testing, the testing solution can be provided in one box. The AIM-GRiD approach removes many challenges associated with front-line data bus testing and delivers powerful, reliable test equipment in a single integrated solution.

## The Future

The AIM-GRiD team has been partnering to provide this high-standard avionics test equipment for fourth-generation fighters for over a decade now, but it is not just limited to these platforms.

Fifth – and soon to be sixth – generation fighters are now becoming a reality and their adoption is growing across the world. Within this global context of next-generation fighter aircraft development, the AIM-GRiD team will be able to adapt this proven data bus testing solution to these new fleets.

This will take into consideration the new demands of these fleets as well as new technologies and new data transfer standards, including the adoption of 10Gb ethernet.

The team is ready to deliver the same powerful data bus test equipment as and when required.

## Contact Us

For more information on the AIM-GRiD avionics test equipment solution, get in touch:

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