

FLEXIBLE AND SCALABLE

Flexibility and scalability are often promised, but without any specific details being given. AIM offers a conceptual view with clear answers and a way to achieve these twin goals

The flexible and scalable test system concept described here is a standalone avionics databus interface device that can be operated over standard Ethernet. Such devices have become popular because of the achievable distances between an avionics bus connection point and the control station.

The Ethernet standard itself is implemented and available on lots of hardware and operating system software platforms, so OS-specific/native device drivers for the interface are no longer needed.

The best Ethernet topology for avionics testing applications depends on the testing program, roughly categorized into the military and commercial areas. With commercial programs and applications, the threshold for using wireless technologies is lower than for military applications. However, a flexible approach should allow operation of such a standalone interface, via either wired or wireless Ethernet, to address unique needs.

In real life, avionics systems typically implement multiple databuses of the same or different types, so that multiple interface devices may also be required. Expansion simply by multiplying the number of interface devices implies multiplication of network cabling, power supplies and more Ethernet switches to connect interface devices to the testing network.

This issue requires scalability. It means having an 'environment' that has common infrastructure resources for devices with Ethernet-based interfaces such as a shared power supply and a single common Ethernet connection point for more than one interface device. Consequently a particular kind of docking station for multiple devices can serve these requirements by having a single, common power supply, as well as an Ethernet switch. Another feature of a docking station is wireless Ethernet capability, which could be offered as a common infrastructure element.



However greater flexibility is achieved when the interface devices, hosted by a docking station, can be used in a standalone mode. A simple solution for this is to have a breakout adapter box or cable for dockable interface devices.

Scalability and flexibility for hardware installations apply equally to software. The basic requirement is an Ethernet interface using an application program interface (API), or test and analysis software that meets the customer's needs. Due to the nature of the network communication, further processing capabilities in interface devices can cope with tasks that need to be executed close to the databus connection point and independently from a host processor, which can include more sophisticated data acquisition/recording, analyzers and gateway

// The ANET functional concept includes software support for an API, Python scripting and PBA.pro configurations

functionality. With today's smart SOC (system on chip) components, local processing power and an open software environment such as Linux, such interface processing capability can be efficiently implemented.

AIM has implemented this tool concept for handling avionics databus protocols such as MIL-STD-1553, ARINC429 and STANAG3910. With accessories and features such as the ADocks, software support for API, Python scripting and various PBA.pro configurations, the AIM ANET interface device family has a range of building blocks for off-the-shelf flexible, scalable test systems. \\\

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