

1394 Trade Association Teams with Aerospace Systems Suppliers to Expand FireWire's Role in Avionics

San Francisco, Calif., May 27, 2014 -- The 1394 Trade Association is working closely with leading aerospace and aviation suppliers to expand and enhance the rapidly growing role of the IEEE1394 standard in next-generation avionics systems.

The AS-1A3 MIL-1394 Task Group met in Santa Barbara in April to continue their work on AS5643, AS5643/1, AS5657, AS5706 and ARP5654 along with new developments such as S100 and S200 slash sheets, gigabit copper and optical fiber implementations. Companies such as BAE, Boeing, DapTechnology, Lockheed Martin, Northrop Grumman and many others are driving the advancement of these standards.

The most notable program using MIL-1394 is the F-35 and its use of S400 (491.52Mb/s), which drove the development of the AS5643/1 S400 copper slash sheet. Other programs require less bandwidth and longer distances, and will benefit from the creation of S100 and S200 sheets. Availability of detailed technical data will allow designers to adapt slower speed versions for applications that do not require maximum bandwidth, said Richard Mourn of DapTechnology B.V., chairman of the 1394 Trade Association and vice chair of the SAE AS-1A3 MIL-1394 Task Group.

Noise immunity and longer distances also are expanding the need for optical fiber implementations. The ARP5654 handbook is being updated, as the past 10 years of experience using MIL-1394 on multiple programs has provided a repository of information and knowledge that is being shared to benefit new programs that implement MIL-1394.

AS5643 and the associated standards define the use of IEEE-1394b-2002 as a data bus network in military and aerospace vehicles (MIL-1394). Together AS5643 and IEEE-1394 deliver a flexible deterministic solution for aerospace and defense applications.

"While high speed 1394 versions have been widely adopted and proven in many avionics systems, we have found that several suppliers can be productive and efficient with slower speed versions," said Mourn. "We are supporting those efforts now and working closely with the developers to provide the exact technology they require."

IEEE-1394 was first standardized in 1995. Major updates were completed in 2000, 2002, and in 2008 (IEEE-1394-2008). IEEE-1394-2008 Beta refined and extended IEEE-1394b-2002. It defines operation from S100 (98.304 Mb/s) to S3200 (3.932 Gb/s). Given this wide range of throughput options, 1394 is

suitable for vehicle management and avionic and mission system networks including Electro-Optic/Infrared (EO/IR) sensor interfaces. Many of the upcoming system designs combine the AS5643 standard with 1394. AS5643 takes advantage of a 1394-2008 beta feature - looped topologies. 1394-2008 beta supports point-to-point, daisy chain, treed and multiple loop topologies. AS5643 recommends using loops to create a first level of topology fault tolerance, then defines a second level using double or even triple redundant networks. In addition to fault tolerance through the network architecture, 1394-defined header and data cyclic redundancy check (CRC) and AS5643-defined vertical parity check (VPC) provide bus level and application level error detection, respectively.

Mourn is an industry veteran who is currently Director of Systems Engineering at DapTechnology B.V., an international developer of test and measurement systems and products. He is a long time member of the 1394 Trade Association board of directors.

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