Involved in a great number of space projects in orbit and beyond for over 20 years, Axon’ Cable has a wealth of experience in designing and manufacturing interconnect solutions able to withstand the stresses of launch and the harsh environment of space.

The company is particularly strong in the area of high data rate interconnect, and has provided high speed links on-board telecommunication, military, scientific and earth observation satellites including Alphasat, ISS, Astro H, Bepi Colombo, Maven, Sentinel and Solar Orbiter.

AXOBUS®: HIGHLY SECURE MIL-STD-1553 DATABUS HARNESSSES
Axon’ Cable combines a wide range of expertise in cable and connector manufacturing. For example, the company designs and manufactures all the key components (cables, couplers and connectors) used in the AXOBUS® MIL-STD-1553 databus looms for military, avionics and space applications.

Axon’ has been supplying these databus looms to the Ariane 5 launcher since the early ’90s.

SPACEWIRE: HIGH INTEGRITY OF LVDS SIGNALS
In addition to databus harnesses which ensure the connection between on-board devices, SpaceWire links (according to ECSS-E-ST-50-11C Rev1) enable faster data transfer rates of up to 400 MB/s.

The ESCC9902/005 qualified cables and ESPC3401/029 EPPL2 Micro-D connectors and accessories manufactured by Axon’ protect the integrity of LVDS signals provided by the devices. The 9 way Micro-D connector can be used with a wide variety of cable types.

Qualified to ESCC9002/004, Axon’ also offers the only true, Low Mass SpaceWire cable, rendering SpaceWire links around half the mass per metre, more flexible and with greater radiation tolerance than existing solutions.

MICROMACH®: ENHANCED HIGH SPEED PERFORMANCE
As data rates and EMI requirements increase, the Micro-D becomes more limited. Axon' has therefore developed MicroMach®, a new, optimized high data rate connector. Drawing on the twin heritages of Axon’s blisteringly fast AxoMach® range and the tried and tested Micro-D with its high-reliability, Twist Pin contact system, this new connector: ¼ very close in size to the 9 way Micro-D, so little additional footprint required on equipments. ¼ has matched 100 ohm impedance pairs, so provides excellent continuity of signal. ¼ enjoys a robust EMC design, providing protection for both the cable and the equipment.

¼ capable of data rates well in excess of typical SpaceWire performance – up to 3Gbps.

The EPPL2-listed MicroMach® range includes four-in-line connector/harness variants, (ESCC4349/002), three PCB variants (ESCC3401/095), and a connector saver (ESCC3401/096). Combined with Axon’s ESCC9902/004 Low Mass SpaceWire cable, this connector provides an unbeatable SpaceWire performance to mass ratio.

With its 4 x 100 ohm matched impedance cavities, and excellent EMC screening on both inner and outer shields, the MicroMach® connector is equally suited to many other high speed protocols, such as Ethernet, where it comfortably exceeds CAT6a requirements.

PROTOCOL DATA RATE

| SPACEWIRE | UP TO 1MB/S |
| SPACEFIBRE, WIZARDLINK | UP TO 400MB/S |
| TT-ETHERNET (THERSPACE) | UP TO 3GB/S |
| RS 422/ RS 485 | UP TO 10GB/S |
| BUS 155S | |

Which Axon’ solutions for which data rate?

ULTRA LOW MASS COAX LINK: SMALL IS BEAUTIFUL!
The Ultra Low Mass Coax link, drawing on Axon’ miniaturized coaxial cable expertise, is almost 30% lighter than the already very light Low Mass SpaceWire.

This radical solution is significantly smaller and more flexible than the conventional twisted pair approach and exceeds the performance requirements for high speed serial data links compared to twisted pair cables. It can be an interesting alternative for applications where installation space and mass budgets are extremely limited, or particularly where an alternative protocol to SpaceWire is used.

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