



**axon'**  
cable & interconnect

# EXPERTISE IN SPACE: CABLES AND INTERCONNECT SOLUTIONS





# Interconnect solutions out-of-this-world

Lightweight, miniature, reliable and highly resistant to cosmic radiation and high temperatures: these are the qualities of wires, cables, cable assemblies, wire harnesses and connectors offered by Axon' for space applications. The scope of products and services offered by the company is extensive:

- ESA wires for spacecraft cabling
- Cable assemblies & harnesses terminated with various connector styles
- MIL-STD-1553 bus harnesses for data transmission
- High data rate assemblies including SpaceWire and very high speed links up to 10 Gb/s
- Microwave coaxial assemblies up to 50 GHz
- Bur bars for power distribution in spacecraft
- Numerous accessories including halorings, EMC banding adaptors and backshells
- Bespoke interconnect solutions
- Cable and interconnect engineering services.



## Flight heritage: to infinity and beyond!

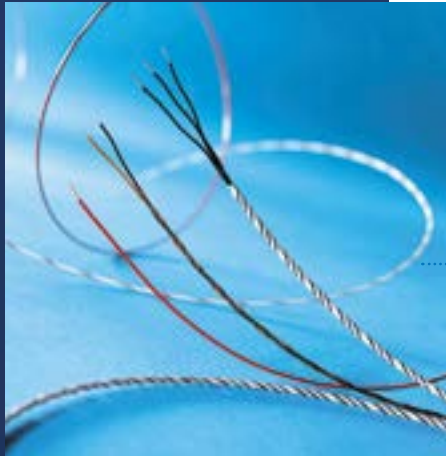
Involved in numerous space projects in orbit and beyond for over 20 years, Axon' Cable has a wealth of experience in designing and manufacturing interconnect solutions able to withstand the stresses of launch and the harsh space environment. Rocket launchers, ISS, Mars rovers, LEO and GEO satellites, manned and unmanned flights, thrusters, space research and experimental equipment are just a few examples.

### SPACE PROGRAMMES WITH AXON' ON-BOARD INCLUDE:

Ariane Alphaspace Curiosity Bepi  
Colombo Corot Eurostar Exomars  
Gaia Galileo Globalstar Insight  
Iridium Mangalyaan Maven O3B  
Sentinel Spacebus Vega



# Wires & cables: weight saving



## ESA WIRES: SATELLITE CABLING

- Large range of wires and cables: single core hook-up wires, coaxial cables, data bus cables, SpaceWire
- Resistant and lightweight
- Compliant with ESCC 3901 & 3902 standards.

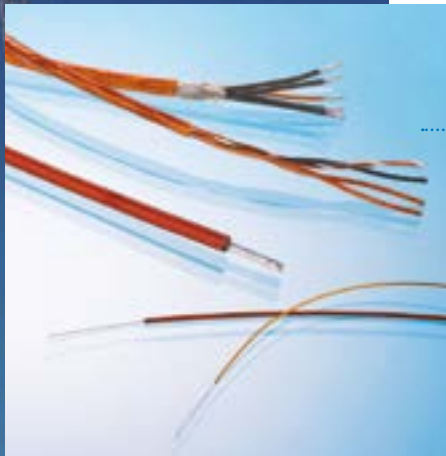
**APPLICATIONS** › spacecraft cabling, internal cabling of electronic boxes, cryogenic applications.



## AXALU<sup>®</sup>, ALUMINIUM WIRES: WEIGHT SAVING

- Aluminium silver plated conductors with cross-linked ETFE insulation.

**APPLICATIONS** › spacecraft cabling, power distribution systems on satellites.



## ELECTRIC PROPULSION CABLES FOR THRUSTERS

- Power cables for the latest generation of satellite thrusters.

**APPLICATIONS** › simplification and mass reduction of the overall thruster whilst withstanding high temperatures, high voltages and cosmic radiation.



## THERMOCOUPLE EXTENSION CABLES

- Made with cost-effective, vacuum compatible materials including bare copper, constantan<sup>®</sup> and FEP
- Accurate and reliable
- Compatible with dedicated contacts and connectors.

**APPLICATIONS** › testing the thermal behaviour of satellites in a vacuum chamber.







# Harness expertise



## DATA TRANSMISSION

- Design and manufacture of all components (cables, couplers, triaxial connectors and contacts) used in data transmission systems in compliance with the **MIL-STD-1553B** standard
- High security of data, signal integrity
- PID & French Space Agency CNES approval.

Axon' offers a complete service from the choice of material or components, to the design, routing, manufacturing, test and qualification of your products. 2D or 3D cabling boards can be developed to ensure perfect **integration** at the customer's facilities, for example where tolerances on length or the required routing are very tight.

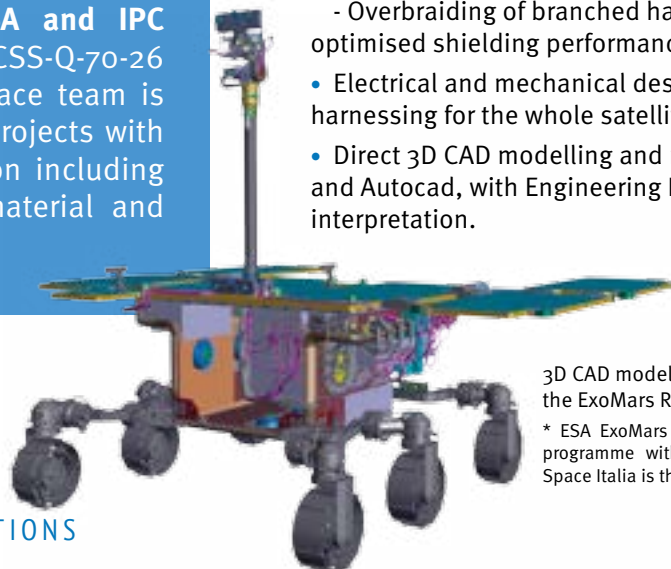
Axon' can also design the harness while working directly on a real scale mock-up provided by the customer. The company is equipped with ISO 7 and ISO 8 **clean rooms** with very stable temperature and humidity control, and the company has experience in working with planetary protection and bioburden requirements .

Axon's manufacturing harness capability consists of highly skilled and experienced operators accredited to **ESA and IPC standards** (ECSS-Q-70-08 / ECSS-Q-70-26 – IPC/WHMA-A-620). Our space team is able to support your space projects with all appropriate documentation including compliance matrix, MTBF, material and process declaration and EIDP.



# Custom design

- Design and manufacture of round or flat cable assemblies terminated with different types of crimped or soldered connectors including: micro-D (EPPL2), D-Sub, MIL-DTL-38999, nano-D (EPPL2), along with additional accessories and components such as grounding terminals, thermistors or encapsulated resistors
- Interconnect solutions including backshells, banding adaptors and halorings
- Expertise in EMC:
  - Simulation and manufacture of braids
  - Overbraiding of branched harnesses to ensure optimised shielding performance
- Electrical and mechanical design of cabling & harnessing for the whole satellite
- Direct 3D CAD modelling and routing in CATIA and Autocad, with Engineering BASE wiring interpretation.



3D CAD model of cable harnessing on the ExoMars Rover Vehicle\*

\* ESA ExoMars Programme is a cooperative programme with Roscosmos. Thales Alenia Space Italia is the ExoMars Prime Contractor.



## POWER DISTRIBUTION

- Electrical power distribution in satellites
- Design and manufacture of bus bars and battery bars
- **Weight saving** and improved heat dissipation in comparison with classic round power cable bundles
- PID & French Space Agency CNES approval.



## LOW LOSS MICROWAVE COAXIAL ASSEMBLIES

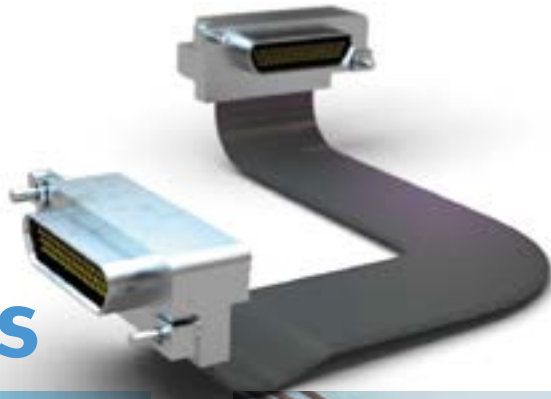
- Coaxial cables terminated with microwave connectors
- Up to 50 GHz
- Space grade versions: **lightweight** microwave cable assemblies with up to 40% mass saving
- Static and dynamic applications
- PID & French Space Agency CNES approval.



## HIGH DATA RATE

- Reliable transmission of data at **high speed** between on-board devices in spacecraft
- SpaceWire : 2 Mb/s to 400 Mb/s
- Low mass version: up to 50% lighter with improved flexibility
- Axomach™ high data rate up to 10 GB/s
- CAN Bus, IEEE1394, TT Ethernet
- PID & French Space Agency CNES approvals.

# Connectors



## MINIATURE MICRO-D CONNECTORS

- 1.27 mm (0.050") contact spacing
- Weight and space saving solution
- ESCC 3401/029 EPPL 2
- Custom design.

## MINIATURE NANO-D CONNECTORS

- 0.635 mm (0.025") contact spacing
- Extreme miniaturization
- ESCC 3401/086 EPPL2.

## MICRO MINIATURE MODULAR CONNECTORS

- Power and Coaxial versions
- Extreme miniaturization
- Dismountable
- Quick lock system.





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