

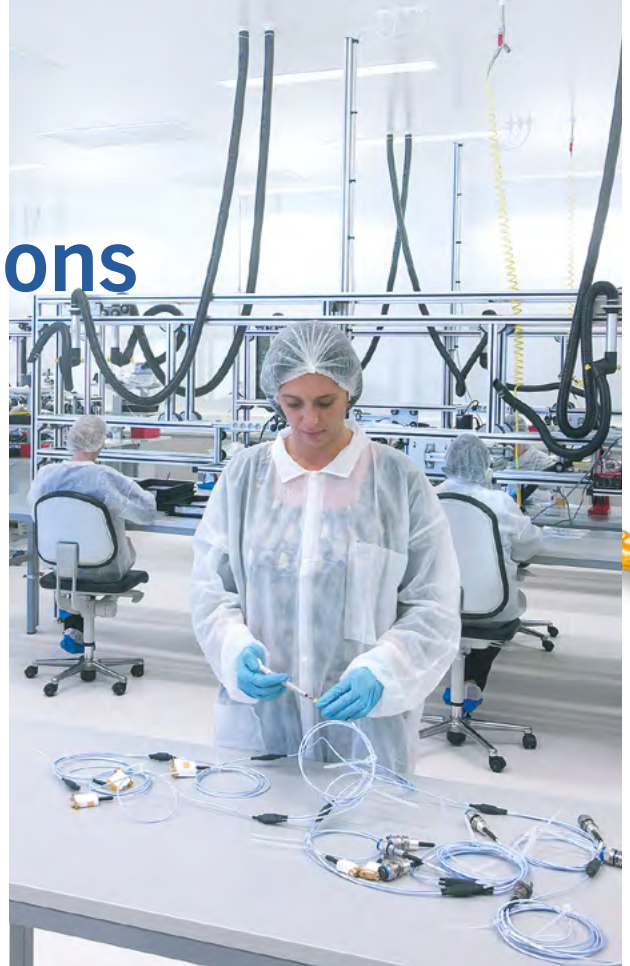
# EXPERTISE IN SPACE: CABLES AND INTERCONNECT SOLUTIONS



# Out-of-the-world interconnect solutions

Lightweight, miniature, reliable and highly resistant to cosmic radiation, extreme temperatures and atomic oxygen: 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 and space grade wires & cables for spacecraft cabling
- Cable assemblies & harnesses terminated with various connector styles including D-Sub, Micro-D and circular
- 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!

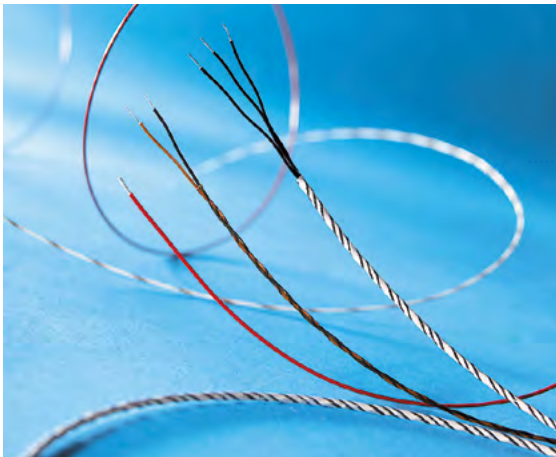
Involved in numerous space projects in orbit and beyond for over 20 years, Axon' Cable has a wealth of experience in designing and manufacturing interconnect solutions able to withstand the stresses of launch and the harsh space environment. Rocket launchers, ISS, Mars rovers, LEO and GEO satellites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

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

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



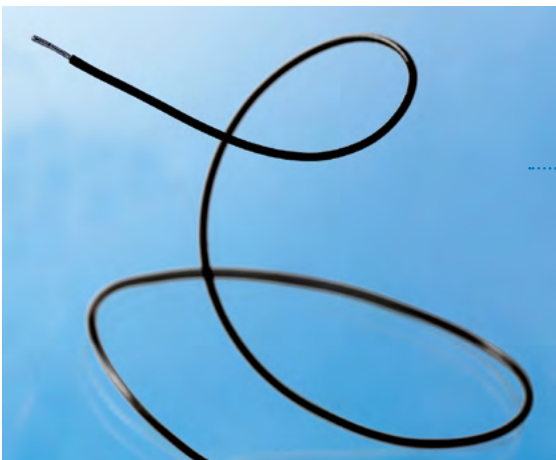
# Wires & cables: weight saving



## ESA AND SPACE GRADE WIRES: SATELLITE CABLING

- Large range of wires and cables: compliant with ESCC 3901 & 3902 standards
- Electric propulsion cables for thrusters
- Axalu® silver plated aluminium wires: 50% to 60% weight saving

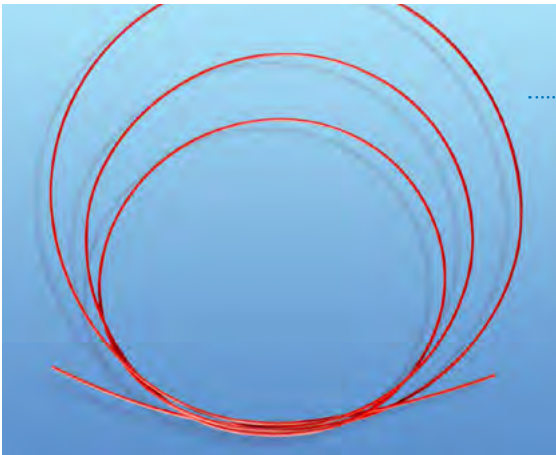
**APPLICATIONS** › spacecraft cabling, internal cabling of electronic boxes, cryogenic applications.



## "SMART" ANTISTATIC WIRES & CABLES

- Low voltage antistatic cables
- Resistant to electrostatic discharges
- Protection of electronic devices in spacecraft

**APPLICATIONS** › panel solar cabling.



## RADATOX® WIRES AND CABLES

- Highly resistant to atomic oxygen
- Radiation resistant
- Flexible

**APPLICATIONS** › cabling of antennae and solar array.



## THERMOCOUPLE EXTENSION CABLES

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

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



## Harness expertise

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.

## 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.



## Custom design

- Design and manufacture of round or flat cable assemblies terminated with different types of crimped or soldered connectors including: micro-D (QPL), 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.



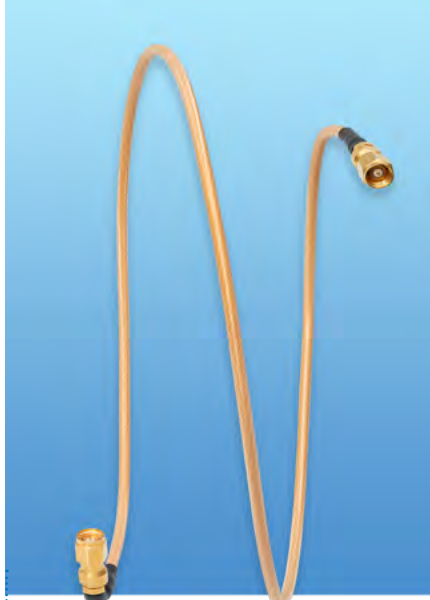
ExoMars Rover Vehicle\*

\* 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
- ESCC3408/003 QPL
- Space grade versions: **lightweight** microwave cable assemblies with up to 40% mass saving
- Static and dynamic applications
- PID & French Space Agency CNES approval.

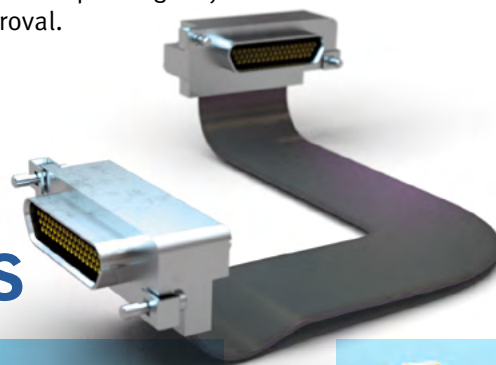


## HIGH DATA RATE

- 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
- Micromach® optimized high speed connector (EPPL2)
- Axomach® high data rate up to 10 GB/s
- CAN Bus, IEEE1394, TT Ethernet
- PID & French Space Agency CNES approvals.

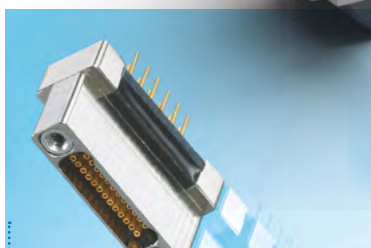


# Connectors



## MINIATURE CONNECTORS

- Micro-D connectors: 1.27 mm (0.050") contact spacing
- ESCC 3401/029 QPL
- Custom design
- D-Click® fast-latching connectors
- ESCC 3401/091 QPL
- Fast integration.



## MINIATURE NANO-D CONNECTORS

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



## VERSATYS® MODULAR CONNECTORS

- Power and coaxial versions
- Dismountable version
- Quick lock system
- According to ESCC3401/092 -/093 -/094.



#### AUSTRALIA

AXON' CONNECT PTY LTD  
TEL.: +61 417 284 674  
[sales.australia@axon-cable.com](mailto:sales.australia@axon-cable.com)

#### BRAZIL

AXON' CABLE IND. E COM. LTDA.  
TEL: +55 21 3596-8002  
[salesbrazil@axon-cable.com](mailto:salesbrazil@axon-cable.com)

#### CANADA

AXON' CÂBLAGE INC  
/AXON' WIRING INC.  
TEL: +1 514 898 2044  
[sales@axoncable.com](mailto:sales@axoncable.com)

#### CHINA

AXON' INTERCONNECT LIMITED  
TEL: +86 757 2838 7200  
[sales@axon-interconnect.com](mailto:sales@axon-interconnect.com)

#### GERMANY

AXON' KABEL GmbH  
TEL: +49 7152 97992-0  
[sales@axon-cable.de](mailto:sales@axon-cable.de)

#### HUNGARY

AXON' KÁBELGYÁRTÓ KFT.  
TEL: +36 76 508 195  
[axon@axon-cable.hu](mailto:axon@axon-cable.hu)

#### INDIA

AXON' INTERCONNECTORS  
AND WIRES PVT LTD  
TEL: +91 806 816 2966  
[sales@axon-cable.in](mailto:sales@axon-cable.in)

#### JAPAN

AXON' CABLE JAPAN OFFICE  
TEL/FAX: +81 26 217 6728  
[axon-japan@axon-cable.com](mailto:axon-japan@axon-cable.com)

#### LATVIA

AXON' CABLE SIA  
TEL: +371 6540 78 91  
[axon@axoncable.lv](mailto:axon@axoncable.lv)

#### MEXICO

AXON' INTERCONEX, S.A. DE C.V  
TEL: +52 442 215 2713  
[axon-mexico@axoncable.com.mx](mailto:axon-mexico@axoncable.com.mx)

#### SINGAPORE

AXON' CONNECT PTE LTD  
TEL: +65 62 50 31 69  
[sales.singapore@axon-cable.com](mailto:sales.singapore@axon-cable.com)

#### SPAIN

AXON' CABLE SPANISH OFFICE  
TEL: +34 911 309 123  
[axon-spain@axon-cable.com](mailto:axon-spain@axon-cable.com)

#### UNITED KINGDOM

AXON' CABLE Ltd  
TEL: +44 1383 421500  
[sales@axon-cable.co.uk](mailto:sales@axon-cable.co.uk)

#### USA

AXON' CABLE INC.  
TEL: +1 847 230 7800  
[sales@axoncable.com](mailto:sales@axoncable.com)

#### HEADQUARTERS / FRANCE

AXON' CABLE SAS  
2 RTE DE CHALONS EN CHAMPAGNE  
51210 MONTMIRAIL  
TEL: +33 3 26 81 70 00  
[sales@axon-cable.com](mailto:sales@axon-cable.com)

VISIT OUR WEBSITE  
[axon-cable.com](http://axon-cable.com)



#### FOLLOW US:

[axon-cable.com](http://axon-cable.com)  
 [axon-cable](https://www.linkedin.com/company/axon-cable)  
 [Axon-Cable](https://www.facebook.com/Axon-Cable)  
 [@axoncable1401](https://www.youtube.com/@axoncable1401)

AGENT AXON'