Harness expertise & quality assurance

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axon' cable & interconnect

Harness expertise

With more than 20 years of experience in harness design and manufacturing for the space market, AXON' proposes a complete service from the choice of material or components, to the design, manufacturing, test and qualification of your products.

Space harness experience

AXON' harnesses are currently flying on various launcher programs (Ariane 5), manned flights (ISS, ATV), telecom satellites (Eurostar 3000, Spacebus 4000,...), scientific and observation satellites (Planck, Cryosat, SMOS, TerraSAR,...).

Certification

AXON' operators are certified by international space agencies on soldering and crimping processes (ECSS-Q-70-26C, ECSS-Q-ST-08C,...).
Additionally, some specific processes have been certified by the French CNES by a Part Identification Document (PID) to highlight AXON's expertise on Bus 1553, SpaceWire and Bus Bar harnesses.

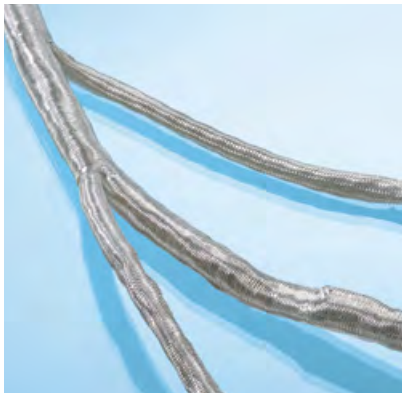
Harness capabilities

AXON' can design and manufacture electrical harnesses terminated with different types of crimped or soldered connectors, e.g. D-Sub, circular, twinaxial, Micro-D, Nano-D connectors, including accessories such as grounding terminals, thermistors, encapsulated resistors,...

These assemblies can be manufactured in one of our ISO 7 (class 10 000) and ISO 8 (class 100 000) clean rooms which represent a total surface are of some 500 m^2. The clean rooms allow for production with a continuously controlled temperature and humidity rate. Particles are controlled by independent companies once a year and AXON' operates additional intermediate controls.

For EMC improvement on the harnesses, AXON' uses a semi-automatic overshielding machine that makes it possible to braid a metallic screen over all harness branches with a controlled coverage rate to ensure shielding performances.

DATABUS HARNESSES



OVERBRAIDED BRANCHED HARNESS

Assessment on material and components

Because a large part of the components are manufactured in-house (cables, Micro-D, Nano-D and twinax connectors, backshells and halorings), it is easy to get reliable material data to assess quality documents during the preliminary design phase.

Manufacturing and routing

2D or 3D cabling boards can be used to ensure the perfect integration at customer's facilities, in case the tolerances for length or routing are very tight.
AXON' can also directly work on a real scale mock-up provided by the customer to design the harness.

Means of test and control

The AXON' control laboratories have at their disposal a wide variety of in-house test equipment to validate the different components for use in space applications:

- Electrical characteristics:
  - Automatic continuity and insulation testing,
  - Dielectric strength,
  - Potential difference,
  - Current flow,
  - Capacitance,
  - Inductance,
  - Transfer impedance (shield efficiency),
  - Reflectometry,
  - Electrical resistance,
  - Presence of short circuits.

- Signal transmission:
  - Time domain:
    - Jitter (RMS, PP),
    - Skew (same pair, between pairs),
    - Eye opening,
    - Zc TDR (pair, connection),
    - TD Cross Talk,
    - ISI (Inter Symbol Interference),
    - Bit error rate B.E.R.,
    - Rise & fall time, overshoots.
  - Frequency domain:
    - Crosstalk (FEXT, NEXT),
    - Insertion loss,
    - Return Loss,
    - Attenuation,
    - Polarity (phase).

MANUFACTURING IN CLEANROOM

EYE PATTERN

AUTOMATIC CONTINUITY AND INSULATION TESTING

VIBRATION TEST

SALT SPRAY RESISTANCE TEST

- Climatic charactreristics:
  - Resistance to salt spray,
  - Rapid change of temperature,
  - Accelerated ageing,
  - Climatic sequence,
  - Endurance at temperature,
  - Ovens in order to operate "burn-out" and minimize the global outgassing of the assembly.

- Mechanical characteristics:
  - Vibration: sinusoidal and random vibrations,
  - Shock,
  - Acceleration.

- Dimensions:
  - High sensitivity video equipment to control dimensions of miniature components,
  - X-ray machine to control inside moulded or potted assemblies which cannot be dismounted.

Any special tests can be carried out with the help of AXON's subcontractors.