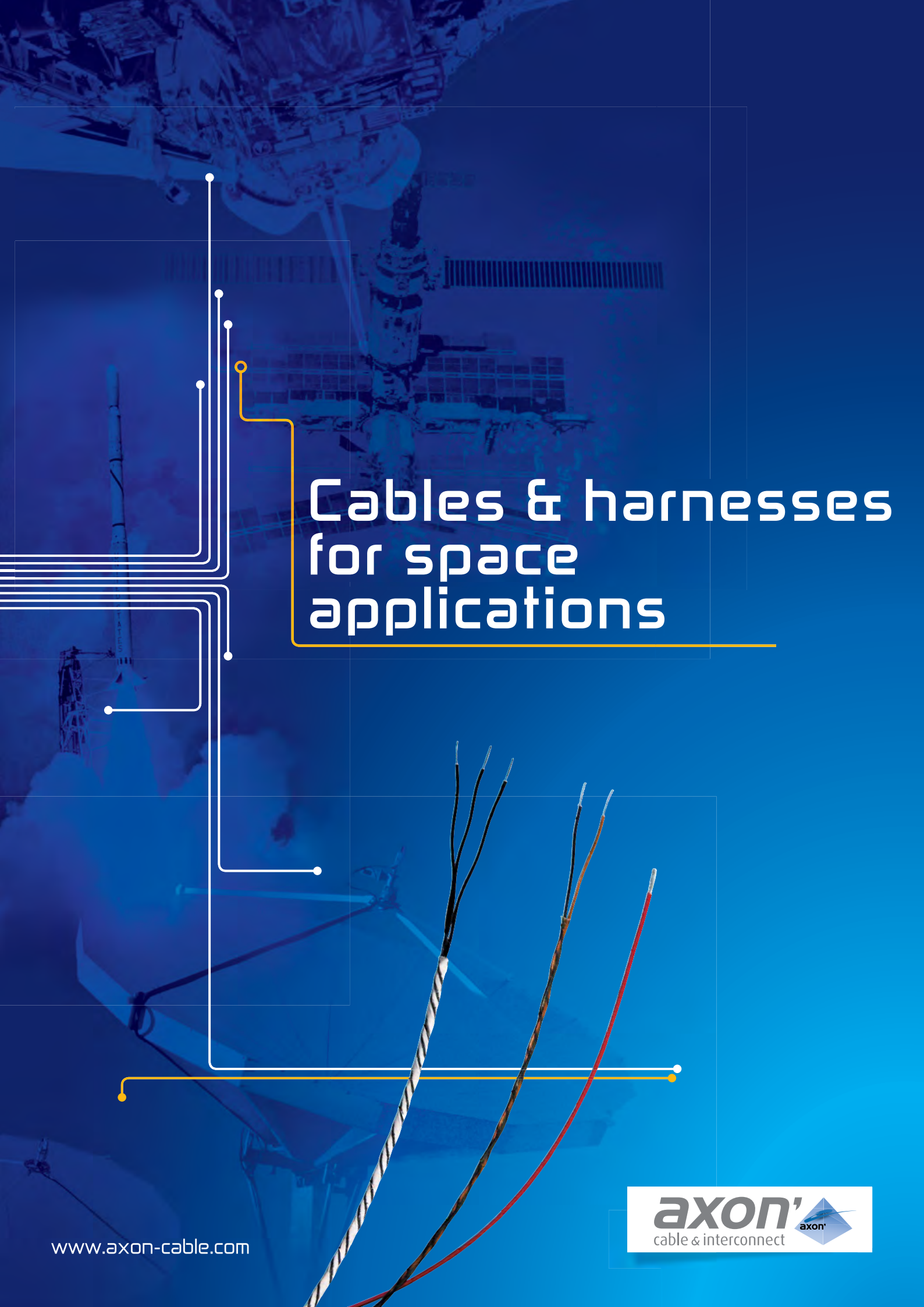
Cables & harnesses for space applications



www.axon-cable.com

axon' cable & interconnect

Contents

This catalogue is a preliminary version of our future complete space product catalogue.
It is composed of nine chapters. More subjects including Nano-D connectors and cables for Thruster will be added to the final version.
This explains the temporary unsystematic page numbering.
Thank you for your comprehension.

Cables & harnesses for space applications

A - ESA WIRES & CABLES / AXALU®

B - QUASI-FLEX®:
Hand-formable semi-rigid substitute

C - THERMOCOUPLE EXTENSION CABLES

D - SPACE MICRO-D CONNECTORS

E - DATABUS HARNESSES

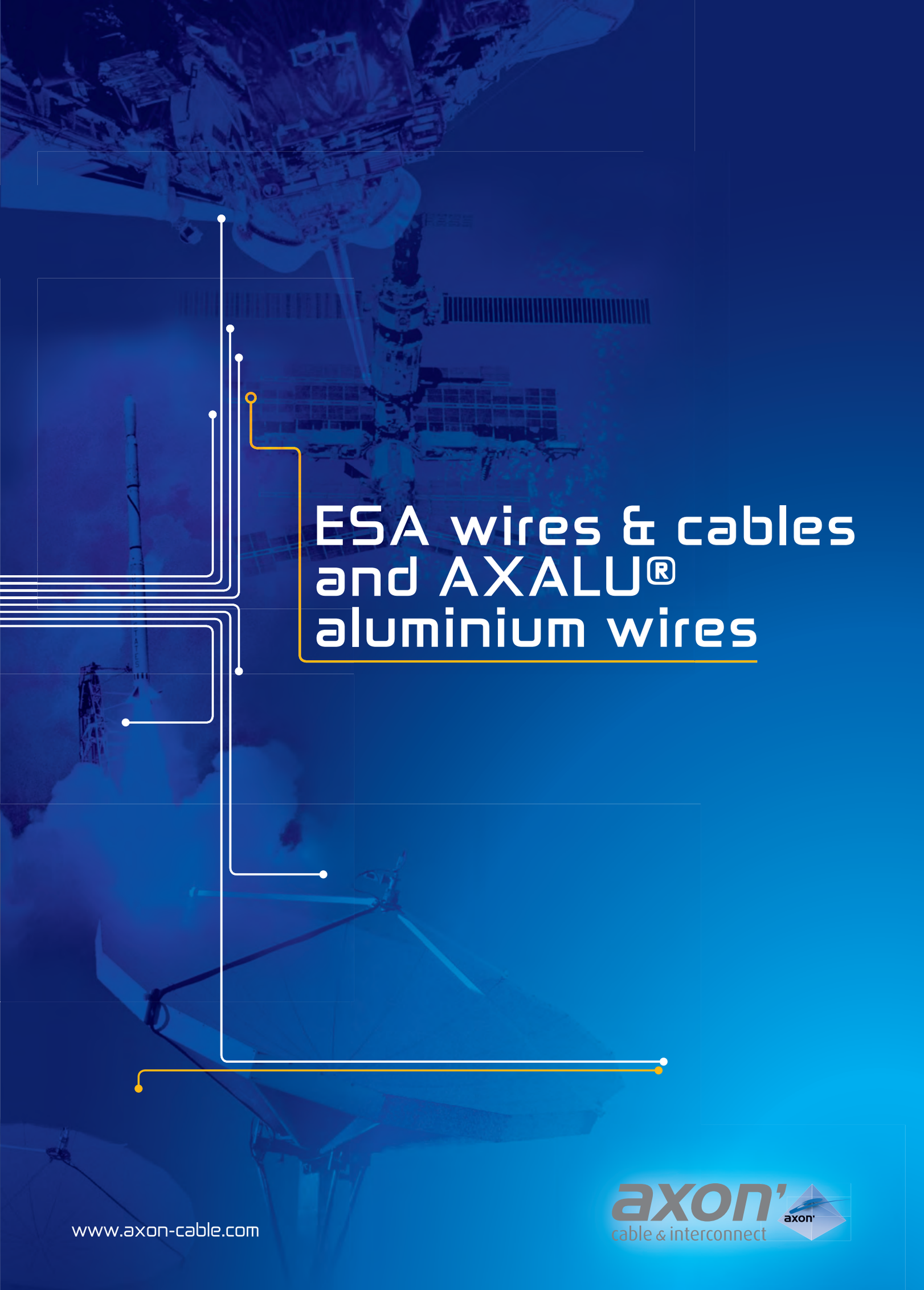
F - HIGH SPEED LINKS

G - POWER DISTRIBUTION SYSTEMS

H - AXOTRESS®

I - ACCESSORIES

J - HARNESS EXPERTISE
& QUALITY ASSURANCE



ESA wires & cables and AXALU® aluminium wires

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ESA wires & cables / AXALU®

ESA wires & cables

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Selection guide

for ESCC low frequency cables, 600 VAC

ESCC wires and cables - AXALU® aluminium cables

AXON' supply a large range of wires and cables in compliance with ESA standards.
In addition AXON' has developed, together with Alcatel Space, AXALU® aluminium round cables for power distribution in satellites.
To help you chose the ESCC or AXALU® wire best suited to your application we propose the following selection guide.

PRODUCT FAMILY	DESCRIPTION	OPERATING TEMPERATURE	APPLICATIONS	APPROVED SPACE PROJECTS
ESCC 3901 001	Polyimide insulated wires and cables	-100°C to +200°C	Large conductor gauges: AWG 12 to 16.	HOT BIRD, LISA PATHFINDER, ARIANE 5, EUROSTAR 3000
ESCC 3901 002	Lightweight polyimide insulated wires and cables	-100°C to +200°C	Smaller conductor gauges than the ESCC 3901 001 family: AWG 18 to 28.	HOT BIRD, LISA PATHFINDER, GAIA, ARIANE 5, ALPHASAT, SENTINEL 2
ESCC 3901 012	Extruded cross-linked ETFE insulated wires and cables	-100°C to +200°C	Large range of conductor gauges from AWG 12 to 30.	CBERS, SAOCOM, SENTINEL
ESCC 3901 013	PTFE insulated wires and cables	-100°C to +200°C	Internal cabling of electronic boxes. PTFE allows for a thinner jacket and improves flexibility.	PLANCK, LISA PATHFINDER
ESCC 3901 018	Polyimide / Fluorothermoplastic insulated wires and cables	-200°C to +200°C	Low Earth Orbit (LEO) applications. Jacket resistant to atomic oxygen (ATOX) environment.	GOCE, BEPI COLOMBO
ESCC 3901 019	CELLOFLON® / Polyimide insulated wires and cables	-200°C to +200°C	Cryogenic applications (optical instruments), and wherever mass is a critical issue. Celloflon® is a weight saving material with high stability across large temperature range.	EXOMARS ROVER, GALILEO
ESCC 3901 021	CELLOFLON® / Polyimide insulated shielded cables with drain wire	-200°C to +200°C	Same as 019 family. In addition, a drain wire is provided to ease shield construction.	
ESCC 3901 024	Abrasion Resistance Tape (ART®) PTFE insulated wires and cables	-200°C to +200°C	Abrasion resistant ART® PTFE AXON' tape Improved flexibility and bend radius.	VEGA LAUNCHER

PRODUCT FAMILY	DESCRIPTION	OPERATING TEMPERATURE	APPLICATIONS	APPROVED SPACE PROJECTS
ESCC 3902 002	Coaxial cable: CELLOFLON® PTFE dielectric	-200°C to +180°C	Coaxial line with 50 or 75 Ohms.	
ESCC 3902 002	Triaxial cable: CELLOFLON® PTFE dielectric	-200°C to +180°C	Triaxial line with 50 or 75 Ohms.	
ESCC 3902 002	Twisted pair bus cable	-200°C to +180°C	Balanced shielded line with 75, 100 or 120 Ohms.	GAIA, HOT BIRD, SENTINEL 1
ESCC 3902 003	SpaceWire quadribus cable	-200°C to +180°C	100 Ohm LVDS protocol	AMS, COROT, GAIA, ALPHASAT

PRODUCT FAMILY	DESCRIPTION	OPERATING TEMPERATURE	APPLICATIONS	APPROVED SPACE PROJECTS
AXALU®	Aluminium silver plated conductors with cross-linked ETFE insulation	-100°C to +150°C	Power distribution systems on satellites. Weightsaving aluminium conductors.	SPACEBUS 2000 & 4000

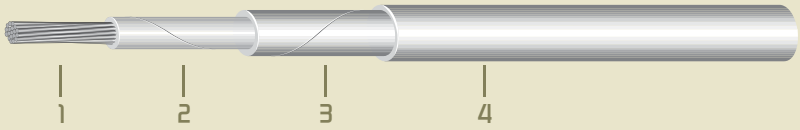
Single wires

ESCC 3901 001

Polyimide insulation

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Polyimide tape,
3 - Polyimide tape,
4 - Polyimide coating.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					MAX. Ø mm	SINGLE WIRE COLOUR	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 001 47	28	19X0.08 SPCA	0.43	0.10	242	0.73	Brown	1.37
ESCC 3901 001 24	26	19X0.10 SPCA	0.53	0.15	148	0.84	Black	2.05
ESCC 3901 001 25	24	19X0.12 SPCA	0.64	0.21	105	0.95	Khaki-beige	2.75
ESCC 3901 001 26	22	19X0.16 SPC	0.85	0.38	50.9	1.15	Red	4.40
ESCC 3901 001 27	20	19X0.20 SPC	1.04	0.60	32.2	1.35	Green	6.65
ESCC 3901 001 28	18	19X0.25 SPC	1.29	0.93	20.6	1.60	Yellow	9.98
ESCC 3901 001 29	16	19X0.30 SPC	1.53	1.30	14.3	1.85	Brown	14.0
ESCC 3901 001 30	14	27X0.30 SPC	1.87	1.90	10.1	2.19	Khaki-beige	19.6
ESCC 3901 001 31	12	45X0.30 SPC	2.50	3.20	6.03	2.80	Khaki-beige	32.1

SPC: silver plated copper - SPCA: silver plated copper alloy

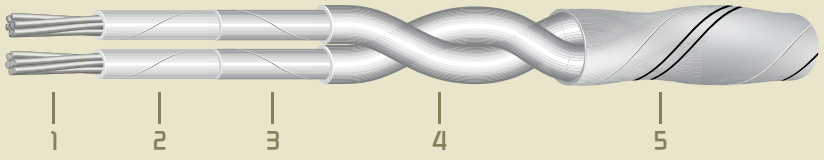
Twisted pairs

ESCC 3901 001

Polyimide insulation

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Polyimide tape,
3 - Polyimide tape,
4 - Polyimide coating,
5 - Polyimide tape with stripes.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	SINGLE WIRE COLOUR	OVERALL MAX. Ø mm	JACKET & STRIPE COLOUR	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km					
ESCC 3901 001 32	16	19X0.30 SPC	1.53	1.30	15.0	1.85	Brown	3.80	Amber & brown	30.7
ESCC 3901 001 33	14	27X0.30 SPC	1.87	1.90	10.6	2.19	Khaki-beige	4.48	Amber & white	43.1
ESCC 3901 001 34	12	45X0.30 SPC	2.40	3.20	6.33	2.80	Khaki-beige	5.70	Amber & white	70.6

Stripe width: 0.6mm ± 30%
Space between two stripes: 1.0mm ± 30%

SPC: silver plated copper

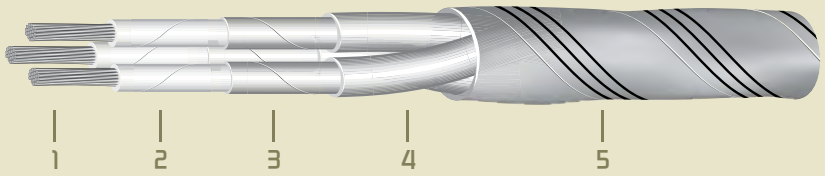
Twisted triples

ESCC 3901 001

Polyimide insulation

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Polyimide tape,
3 - Polyimide tape,
4 - Polyimide coating,
5 - Polyimide tape with stripes.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	SINGLE WIRE COLOUR	OVERALL MAX. Ø mm	JACKET & STRIPE COLOUR	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km					
ESCC 3901 001 35	16	19X0.30 SPC	1.53	1.30	15.0	1.85	Brown	4.08	Amber & Brown	46.1
ESCC 3901 001 36	14	27X0.30 SPC	1.87	1.90	10.6	2.19	Khaki-beige	4.82	Amber & White	64.6
ESCC 3901 001 37	12	45X0.30 SPC	2.40	3.20	6.33	2.8	Khaki-beige	6.15	Amber & White	106

Stripe width: 0.6mm ± 30%
Space between two stripes: 1.0mm ± 30%

SPC: silver plated copper

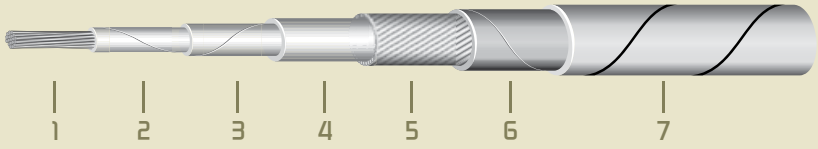
Shielded jacketed single wires

ESCC 3901 001

Polyimide insulation

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Polyimide tape,
3 - Polyimide tape,
4 - Polyimide coating,
5 - Silver plated copper helicoidal shield,
6 - Polyimide tape,
7 - FEP coating with stripes.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	SINGLE WIRE COLOUR	OVERALL MAX. Ø mm	JACKET & STRIPE COLOUR	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km						
ESCC 3901 001 38	16	19X0.30 SPC	1.53	1.30	14.30	0.10	1.85	Brown	2.23	White & Brown	18.8
ESCC 3901 001 39	14	27X0.30 SPC	1.87	1.90	10.10	0.12	2.19	Khaki-beige	2.63	Light blue & White	27.0
ESCC 3901 001 40	12	45X0.30 SPC	2.40	3.20	6.03	0.15	2.80	Khaki-beige	3.30	Light blue & White	43.3

Stripe width: 0.6mm ± 30%

SPC: silver plated copper

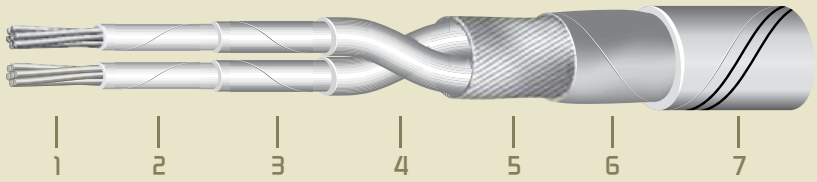
Shielded jacketed twisted pairs

ESCC 3901 001

Polyimide insulation

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Polyimide tape,
3 - Polyimide tape,
4 - Polyimide coating,
5 - Silver plated copper helicoidal shield,
6 - Polyimide tape,
7 - PTFE tape with stripes.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	SINGLE WIRE COLOUR	OVERALL MAX. Ø mm	JACKET & STRIPE COLOUR	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km						
ESCC 3901 001 41	16	19X0.30 SPC	1.53	1.30	15.00	0.15	1.85	Brown	4.26	White & Brown	41.8
ESCC 3901 001 42	14	27X0.30 SPC	1.87	1.90	10.60	0.15	2.19	Khaki-beige	5.07	Light blue & White	55.6
ESCC 3901 001 43	12	45X0.30 SPC	2.40	3.20	6.33	0.20	2.80	Khaki-beige	6.30	Light blue & White	90.5

Stripe width: 0.6mm ± 30%
Space between two stripes: 1.0mm ± 30%

SPC: silver plated copper

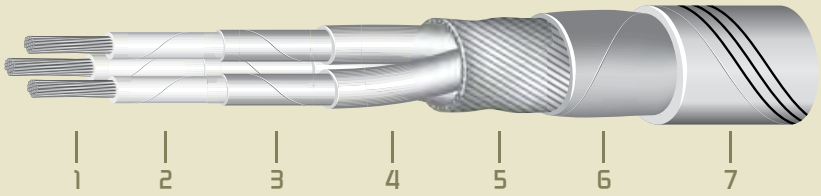
Shielded jacketed twisted triples

ESCC 3901 001

Polyimide insulation

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Polyimide tape,
3 - Polyimide tape,
4 - Polyimide coating,
5 - Silver plated copper helicoidal shield,
6 - Polyimide tape,
7 - PTFE tape with stripes.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	SINGLE WIRE COLOUR	OVERALL MAX. Ø mm	JACKET & STRIPE COLOUR	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km						
ESCC 3901 001 44	16	19X0.30 SPC	1.53	1.30	15	0.15	1.85	Brown	4.54	White & Brown	58.2
ESCC 3901 001 45	14	27X0.30 SPC	1.87	1.90	10.60	0.20	2.19	Khaki-beige	5.40	Light blue & White	83.3
ESCC 3901 001 46	12	45X0.30 SPC	2.40	3.20	6.33	0.20	2.80	Khaki-beige	6.72	Light blue & White	127.3

Stripe width: 0.6mm ± 30%
Space between two stripes: 1.0mm ± 30%

SPC: silver plated copper

Single wires

ESCC 3901 002

Polyimide insulation, light version

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.

Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Polyimide tape,
3 - Polyimide coating.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					MAX. Ø mm	SINGLE WIRE COLOUR	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 002 61	28	19X0.08 SPCA	0.43	0.10	242	0.68	Brown	1.23
ESCC 3901 002 56	26	19X0.10 SPCA	0.53	0.15	148	0.78	Black	1.93
ESCC 3901 002 57	24	19X0.12 SPCA	0.64	0.21	105	0.88	Khaki-beige	2.64
ESCC 3901 002 58	22	19X0.16 SPC	0.85	0.38	50.9	1.08	Red	4.25
ESCC 3901 002 59	20	19X0.20 SPC	1.04	0.60	32.2	1.28	Green	6.49
ESCC 3901 002 60	18	19X0.25 SPC	1.29	0.93	20.6	1.53	Yellow	9.79

SPC: silver plated copper - SPCA: silver plated copper alloy

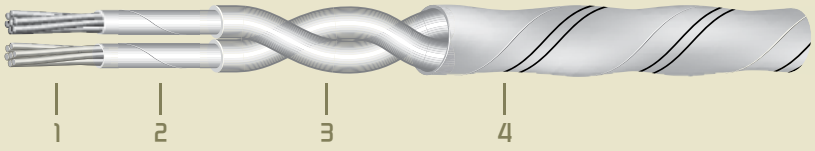
Twisted pairs

ESCC 3901 002

Polyimide insulation, light version

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Polyimide tape,
3 - Polyimide coating,
4 - Polyimide tape with stripes.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	SINGLE WIRE COLOUR	OVERALL MAX. Ø mm	JACKET & NUMBER, TYPE & COLOUR OF STRIPES	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km					
ESCC 3901 002 62	28	19X0.08 SPCA	0.43	0.10	254	0.68	Brown	1.43	Amber & 2 narrow brown	2.70
ESCC 3901 002 31	26	19x0.10 SPCA	0.53	0.15	155	0.78	Black	1.64	Amber & 2 narrow black	4.42
ESCC 3901 002 32	24	19x0.12 SPCA	0.64	0.21	110	0.88	Khaki-beige	1.84	Amber & 2 narrow white	5.91
ESCC 3901 002 33	22	19x0.16 SPC	0.85	0.38	53.5	1.08	Red	2.24	Amber & 2 narrow red	9.41
ESCC 3901 002 34	20	19x0.20 SPC	1.04	0.60	33.8	1.28	Green	2.64	Amber & 2 narrow green	14.20
ESCC 3901 002 35	18	19x0.25 SPC	1.29	0.93	21.6	1.53	Yellow	3.15	Amber & 2 narrow yellow	21.30

Stripe width: 0.6mm ± 30%
Space between two stripes: 1.0mm ± 30%

SPC: silver plated copper - SPCA: silver plated copper alloy

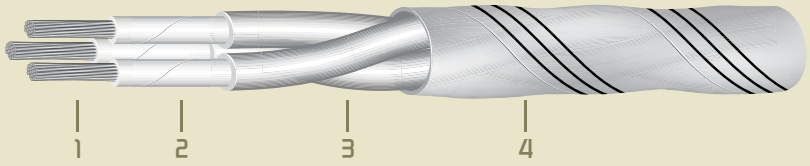
Twisted triples

ESCC 3901 002

Polyimide insulation, light version

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Polyimide tape,
3 - Polyimide coating,
4 - Polyimide tape with stripes.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
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- resist large overloads with no fire risk,
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- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	SINGLE WIRE COLOUR	OVERALL MAX. Ø mm	JACKET & NUMBER, TYPE & COLOUR OF STRIPES	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km					
ESCC 3901 002 63	28	19X0.08 SPCA	0.43	0.10	254	0.68	Brown	1.53	Amber	3.95
ESCC 3901 002 36	26	19x0.10 SPCA	0.53	0.15	155	0.78	Black	1.76	Amber & 3 narrow black	6.45
ESCC 3901 002 37	24	19x0.12 SPCA	0.64	0.21	110	0.88	Khaki-beige	1.97	Amber & 3 narrow white	8.81
ESCC 3901 002 38	22	19x0.16 SPC	0.85	0.38	53.5	1.08	Red	2.40	Amber & 3 narrow red	14.30
ESCC 3901 002 39	20	19x0.20 SPC	1.04	0.60	33.8	1.28	Green	2.84	Amber & 3 narrow green	21.10
ESCC 3901 002 40	18	19x0.25 SPC	1.29	0.93	21.6	1.53	Yellow	3.40	Amber & 3 narrow yellow	31.60

Stripe width: 0.6mm ± 30%
Space between two stripes: 1.0mm ± 30%

SPC: silver plated copper - SPCA: silver plated copper alloy

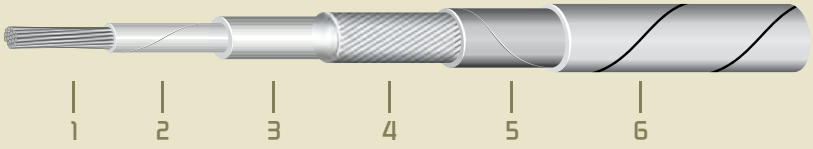
Shielded jacketed single wires

ESCC 3901 002

Polyimide insulation, light version

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Polyimide tape,
3 - Polyimide coating,
4 - Silver plated copper helicoidal shield,
5 - Polyimide tape,
6 - FEP coating with stripes.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	SINGLE WIRE COLOUR	OVERALL MAX. Ø mm	JACKET & NUMBER, TYPE & COLOUR OF STRIPES	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RES. AT 20°C Ω / km						
ESCC 3901 002 64	28	19X0.08 SPCA	0.43	0.10	242	0.08	0.68	Brown	1.07	White & 1 narrow ■	3.05
ESCC 3901 002 41	26	19x0.10 SPCA	0.53	0.15	148	0.08	0.78	Black	1.13	White & 1 narrow ■	3.85
ESCC 3901 002 42	24	19x0.12 SPCA	0.64	0.21	105	0.08	0.88	Khaki-beige	1.23	Light blue & 1 narrow □	4.75
ESCC 3901 002 43	22	19x0.16 SPC	0.85	0.38	50.9	0.08	1.08	Red	1.43	White & 1 narrow ■	6.86
ESCC 3901 002 44	20	19x0.20 SPC	1.04	0.60	32.2	0.08	1.28	Green	1.63	White & 1 narrow ■	9.43
ESCC 3901 002 45	18	19x0.25 SPC	1.29	0.93	20.6	0.10	1.53	Yellow	1.92	White & 1 narrow ■	13.8

Stripe width: 0.6mm ± 30%

SPC: silver plated copper - SPCA: silver plated copper alloy

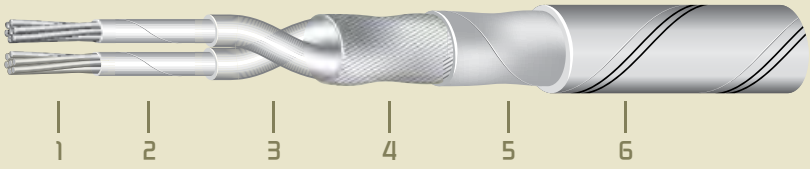
Shielded jacketed twisted pairs

ESCC 3901 002

Polyimide insulation, light version

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Polyimide tape,
3 - Polyimide coating,
4 - Silver plated copper helicoidal shield,
5 - Polyimide tape,
6 - PTFE tape with stripes.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	SINGLE WIRE COLOUR	OVERALL MAX. Ø mm	JACKET & NUMBER, TYPE & COLOUR OF STRIPES	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RES. AT 20°C Ω / km						
ESCC 3901 002 65	28	19X0.08 SPCA	0.43	0.10	254	0.08	0.68	Brown	1.80	White & 2 narrow	5.70
ESCC 3901 002 46	26	19x0.10 SPCA	0.53	0.15	155	0.08	0.78	Black	2.01	White & 2 narrow	8.00
ESCC 3901 002 47	24	19x0.12 SPCA	0.64	0.21	110	0.10	0.88	Khaki-beige	2.24	Light blue & 2 narrow	10.50
ESCC 3901 002 48	22	19x0.16 SPC	0.85	0.38	53.5	0.10	1.08	Red	2.65	White & 2 narrow	14.80
ESCC 3901 002 49	20	19x0.20 SPC	1.04	0.60	33.8	0.10	1.28	Green	3.03	White & 2 narrow	20.20
ESCC 3901 002 50	18	19x0.25 SPC	1.29	0.93	21.6	0.12	1.53	Yellow	3.58	White & 2 narrow	29.60

Stripe width: 0.6mm ± 30%
Space between two stripes: 1.0mm ± 30%

SPC: silver plated copper - SPCA: silver plated copper alloy

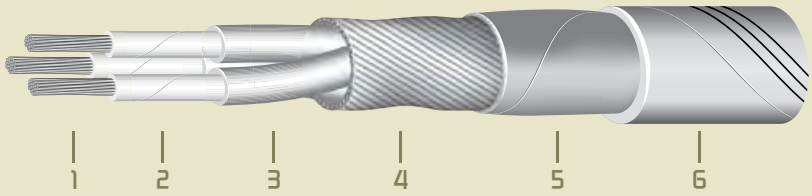
Shielded jacketed twisted triples

ESCC 3901 002

Polyimide insulation, light version

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Polyimide tape,
3 - Polyimide coating,
4 - Silver plated copper helicoidal shield,
5 - Polyimide tape,
6 - PTFE tape with stripes.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	SINGLE WIRE COLOUR	OVERALL MAX. Ø mm	JACKET & NUMBER, TYPE & COLOUR OF STRIPES	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RES. AT 20°C Ω / km						
ESCC 3901 002 66	28	19X0.08 SPCA	0.43	0.10	254	0.10	0.68	Brown	1.92	White	8.10
ESCC 3901 002 51	26	19x0.10 SPCA	0.53	0.15	155	0.10	0.78	Black	2.15	White & 3 narrow ■	11.20
ESCC 3901 002 52	24	19x0.12 SPCA	0.64	0.21	110	0.10	0.88	Khaki-beige	2.36	Light blue & 3 narrow □	14.00
ESCC 3901 002 53	22	19x0.16 SPC	0.85	0.38	53.5	0.10	1.08	Red	2.82	White & 3 narrow ■	20.20
ESCC 3901 002 54	20	19x0.20 SPC	1.04	0.60	33.8	0.12	1.28	Green	3.26	White & 3 narrow ■	29.40
ESCC 3901 002 55	18	19x0.25 SPC	1.29	0.93	21.6	0.15	1.53	Yellow	3.86	White & 3 narrow ■	44.10

Stripe width: 0.6mm ± 30%
Space between two stripes: 1.0mm ± 30%

SPC: silver plated copper - SPCA: silver plated copper alloy

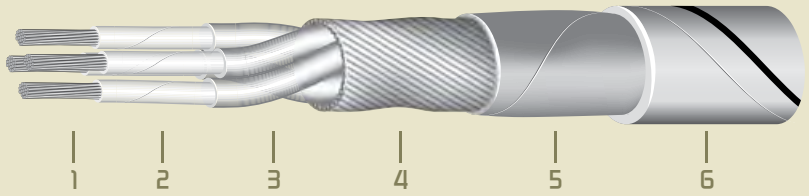
Shielded jacketed twisted quads

ESCC 3901 002

Polyimide insulation, light version

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Polyimide tape,
3 - Polyimide coating,
4 - Silver plated copper helicoidal shield,
5 - Polyimide tape,
6 - PTFE tape with stripes.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	SINGLE WIRE COLOUR	OVERALL MAX. Ø mm	JACKET & NUMBER, TYPE & COLOUR OF STRIPES	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RES. AT 20°C Ω / km						
ESCC 3901 002 67	28	19X0.08 SPCA	0.43	0.10	254	0.10	0.68	Brown	2.15	White & 1 wide ■	10.15
ESCC 3901 002 68	26	19x0.10 SPCA	0.53	0.15	155	0.10	0.78	Black	2.40	White & 1 wide ■	13.30
ESCC 3901 002 69	24	19x0.12 SPCA	0.64	0.21	110	0.10	0.88	Khaki-beige	2.65	Light blue & 1 wide □	16.50
ESCC 3901 002 70	22	19x0.16 SPC	0.85	0.38	53.5	0.12	1.08	Red	3.17	White & 1 wide ■	26.40
ESCC 3901 002 71	20	19x0.20 SPC	1.04	0.60	33.8	0.15	1.28	Green	3.70	White & 1 wide ■	38.80

Stripe width: 1.0mm ± 30%

SPC: silver plated copper - SPCA: silver plated copper alloy

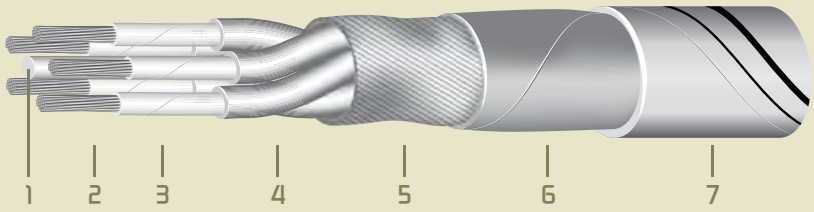
Shielded jacketed twisted 5-core cables

ESCC 3901 002

Polyimide insulation, light version

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - PTFE filler,
2 - Stranded silver plated copper or copper alloy conductor,
3 - Polyimide tape,
4 - Polyimide coating,
5 - Silver plated copper helicoidal shield,
6 - Polyimide tape,
7 - PTFE tape with stripes.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	SINGLE WIRE COLOUR	OVERALL MAX. Ø mm	JACKET & NUMBER, TYPE & COLOUR OF STRIPES	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RES. AT 20°C Ω / km						
ESCC 3901 002 72	28	19X0.08 SPCA	0.43	0.10	254	0.10	0.68	Brown	2.27	White & 1 wide, 1 narrow ■	12.10
ESCC 3901 002 73	26	19x0.10 SPCA	0.53	0.15	155	0.10	0.78	Black	2.56	White & 1 wide, 1 narrow ■	15.80

Narrow stripe width: 0.6mm ± 30%
Wide stripe width: 1.0mm ± 30%
Space between two stripes: 1.0mm ± 30%

SPCA: silver plated copper alloy

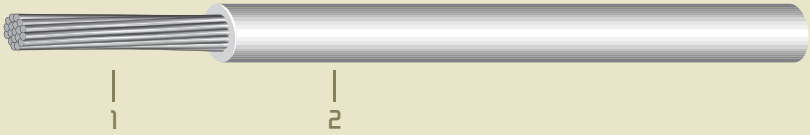
Single wires

ESCC 3901 012

Crosslinked ETFE insulation, standard version

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,

2 - Extruded crosslinked ETFE insulation.

Colour to be specified when ordering (see page A–27):
black, brown, red, orange, yellow, green, blue, violet, grey, white.
Note: the colours are light.

Main characteristics

Good physical, chemical and electrical properties:

- good penetration resistance under pressure,
- good radiation resistance,
- resist large overloads with no fire risk,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km		
ESCC 3901 012 01*	30	7X0.10 SPCA	0.30	0.06	385.1	0.64	0.98
ESCC 3901 012 02	28	7X0.12 SPCA	0.38	0.08	244	0.70	1.35
ESCC 3901 012 03	26	19X0.10 SPCA	0.53	0.15	149	0.86	2.11
ESCC 3901 012 04	24	19X0.12 SPCA	0.66	0.25	106.2	0.99	2.97
ESCC 3901 012 05	22	19X0.15 SPC	0.79	0.40	54.3	1.14	4.30
ESCC 3901 012 06	20	19X0.20 SPC	1.04	0.60	32.3	1.37	6.91
ESCC 3901 012 07	18	19X0.25 SPC	1.29	1.00	20.3	1.63	10.37
ESCC 3901 012 08	16	19X0.30 SPC	1.55	1.20	14.8	1.90	14.59
ESCC 3901 012 09	14	37X0.25 SPC	1.82	2.00	10.2	2.29	19.60
ESCC 3901 012 10	12	37X0.32 SPC	2.28	3.00	6.51	2.74	31.23

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

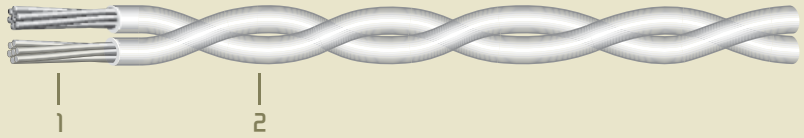
Twisted pairs

ESCC 3901 012

Crosslinked ETFE insulation, standard version

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,

2 - Extruded crosslinked ETFE insulation.

Colour to be specified when ordering (see page A–27):
black, brown, red, orange, yellow, green, blue, violet, grey, white.
Note: the colours are light.

Main characteristics

Good physical, chemical and electrical properties:

- good penetration resistance under pressure,
- good radiation resistance,
- resist large overloads with no fire risk,
- resistant to most chemicals
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 012 11*	30	7X0.10 SPCA	0.30	0.06	385.1	0.63	1.28	2.04
ESCC 3901 012 12	28	7X0.12 SPCA	0.38	0.08	244	0.69	1.40	2.78
ESCC 3901 012 13	26	19X0.10 SPCA	0.53	0.15	149	0.86	1.78	4.43
ESCC 3901 012 14	24	19X0.12 SPCA	0.66	0.25	106.2	0.99	1.98	6.12
ESCC 3901 012 15	22	19X0.15 SPC	0.79	0.40	54.3	1.14	2.28	8.86
ESCC 3901 012 16	20	19X0.20 SPC	1.04	0.60	32.3	1.37	2.74	14.48
ESCC 3901 012 17	18	19X0.25 SPC	1.29	1.00	20.3	1.63	3.26	21.74
ESCC 3901 012 18	16	19X0.30 SPC	1.55	1.20	14.8	1.90	3.80	30.58
ESCC 3901 012 19	14	37X0.25 SPC	1.82	2.00	10.2	2.29	4.58	40.84
ESCC 3901 012 20	12	37X0.32 SPC	2.28	3.00	6.51	2.74	5.48	65.46

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

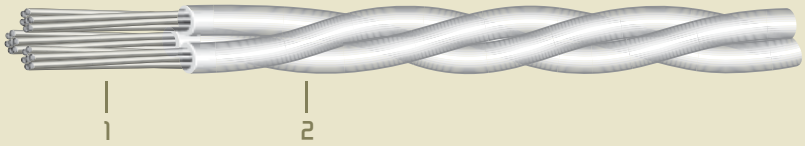
Twisted triples

ESCC 3901 012

Crosslinked ETFE insulation, standard version

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,

2 - Extruded crosslinked ETFE insulation.

Colour to be specified when ordering (see page A–28):
black, brown, red, orange, yellow, green, blue, violet, grey, white.
Note: the colours are light.

Main characteristics

Good physical, chemical and electrical properties:

- good penetration resistance under pressure,
- good radiation resistance,
- resist large overloads with no fire risk,
- resistant to most chemicals
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 012 21*	30	7X0.10 SPCA	0.30	0.06	385.1	0.63	1.37	3.03
ESCC 3901 012 22	28	7X0.12 SPCA	0.38	0.08	244	0.69	1.50	4.17
ESCC 3901 012 23	26	19X0.10 SPCA	0.53	0.15	149	0.86	1.86	6.64
ESCC 3901 012 24	24	19X0.12 SPCA	0.66	0.25	106.2	0.99	2.14	9.18
ESCC 3901 012 25	22	19X0.15 SPC	0.79	0.40	54.3	1.14	2.46	13.29
ESCC 3901 012 26	20	19X0.20 SPC	1.04	0.60	32.3	1.37	2.95	21.72
ESCC 3901 012 27	18	19X0.25 SPC	1.29	1.00	20.3	1.63	3.52	32.61
ESCC 3901 012 28	16	19X0.30 SPC	1.55	1.20	14.8	1.90	4.10	45.88
ESCC 3901 012 29	14	37X0.25 SPC	1.82	2.00	10.2	2.29	4.95	61.26
ESCC 3901 012 30	12	37X0.32 SPC	2.28	3.00	6.51	2.74	5.92	98.19

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

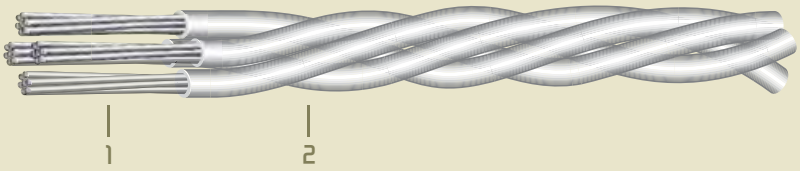
Twisted quads

ESCC 3901 012

Crosslinked ETFE insulation, standard version

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,

2 - Extruded crosslinked ETFE insulation.

Colour to be specified when ordering (see page A–28):
black, brown, red, orange, yellow, green, blue, violet, grey, white.
Note: the colours are light.

Main characteristics

Good physical, chemical and electrical properties:

- good penetration resistance under pressure,
- good radiation resistance,
- resist large overloads with no fire risk,
- resistant to most chemicals
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 012 31*	30	7X0.10 SPCA	0.30	0.06	385.1	0.63	1.54	4.07
ESCC 3901 012 32	28	7X0.12 SPCA	0.38	0.08	244	0.69	1.68	5.56
ESCC 3901 012 33	26	19X0.10 SPCA	0.53	0.15	149	0.86	2.07	8.86
ESCC 3901 012 34	24	19X0.12 SPCA	0.66	0.25	106.2	0.99	2.39	12.24
ESCC 3901 012 35	22	19X0.15 SPC	0.79	0.40	54.3	1.14	2.75	17.72
ESCC 3901 012 36	20	19X0.20 SPC	1.04	0.60	32.3	1.37	3.30	28.96
ESCC 3901 012 37	18	19X0.25 SPC	1.29	1.00	20.3	1.63	3.93	43.48
ESCC 3901 012 38	16	19X0.30 SPC	1.55	1.20	14.8	1.90	4.57	61.17
ESCC 3901 012 39	14	37X0.25 SPC	1.82	2.00	10.2	2.29	5.52	81.68
ESCC 3901 012 40	12	37X0.32 SPC	2.28	3.00	6.51	2.74	6.60	130.92

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

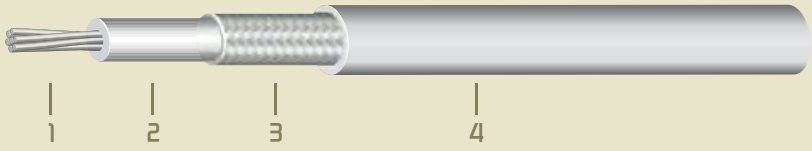
Shielded jacketed single wires

ESCC 3901 012

Crosslinked ETFE insulation, standard version

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Extruded crosslinked ETFE insulation,
3 - Silver plated copper shield,
4 - Extruded crosslinked ETFE insulation.

Colour to be specified when ordering (see page A–27):
black, brown, red, orange, yellow, green, blue, violet, grey, white.
Note: the colours are light.

Main characteristics

Good physical, chemical and electrical properties:

- good penetration resistance under pressure,
- good radiation resistance,
- resist large overloads with no fire risk,
- resistant to most chemicals
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 012 41*	30	7X0.10 SPCA	0.30	0.06	385.1	0.10	0.63	1.57	5.60
ESCC 3901 012 42	28	7X0.12 SPCA	0.38	0.08	244	0.10	0.69	1.65	6.12
ESCC 3901 012 43	26	19X0.10 SPCA	0.53	0.15	149	0.10	0.86	1.76	7.63
ESCC 3901 012 44	24	19X0.12 SPCA	0.66	0.25	106.2	0.10	0.99	1.89	8.97
ESCC 3901 012 45	22	19X0.15 SPC	0.79	0.40	54.3	0.10	1.14	2.03	10.95
ESCC 3901 012 46	20	19X0.20 SPC	1.04	0.60	32.3	0.10	1.37	2.26	14.97
ESCC 3901 012 47	18	19X0.25 SPC	1.29	1.00	20.3	0.10	1.63	2.52	19.71
ESCC 3901 012 48	16	19X0.30 SPC	1.55	1.20	14.8	0.10	1.90	2.78	25.03
ESCC 3901 012 49	14	37X0.25 SPC	1.82	2.00	10.2	0.10	2.29	3.17	31.20
ESCC 3901 012 50	12	37X0.32 SPC	2.28	3.00	6.51	0.10	2.74	3.65	45.48

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

Shielded jacketed twisted pairs

ESCC 3901 012

Crosslinked ETFE insulation, standard version

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.

Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Extruded crosslinked ETFE insulation,
3 - Silver plated copper shield,
4 - Extruded crosslinked ETFE insulation.

Colour to be specified when ordering (see page A–27):
black, brown, red, orange, yellow, green, blue, violet, grey, white.
Note: the colours are light.

Main characteristics

Good physical, chemical and electrical properties:

- good penetration resistance under pressure,
- good radiation resistance,
- resist large overloads with no fire risk,
- resistant to most chemicals
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 012 51*	30	7X0.10 SPCA	0.30	0.06	385.1	0.10	0.63	2.18	8.82
ESCC 3901 012 52	28	7X0.12 SPCA	0.38	0.08	244	0.10	0.69	2.34	9.86
ESCC 3901 012 53	26	19X0.10 SPCA	0.53	0.15	149	0.10	0.86	2.59	12.92
ESCC 3901 012 54	24	19X0.12 SPCA	0.66	0.25	106.2	0.10	0.99	2.87	15.31
ESCC 3901 012 55	22	19X0.15 SPC	0.79	0.40	54.3	0.10	1.14	3.17	19.34
ESCC 3901 012 56	20	19X0.20 SPC	1.04	0.60	32.3	0.10	1.37	3.59	27.06
ESCC 3901 012 57	18	19X0.25 SPC	1.29	1.00	20.3	0.10	1.63	4.14	36.45
ESCC 3901 012 58	16	19X0.30 SPC	1.55	1.20	14.8	0.10	1.90	4.61	47.43
ESCC 3901 012 59	14	37X0.25 SPC	1.82	2.00	10.2	0.10	2.29	5.46	59.82
ESCC 3901 012 60	12	37X0.32 SPC	2.28	3.00	6.51	0.10	2.74	6.43	88.52

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

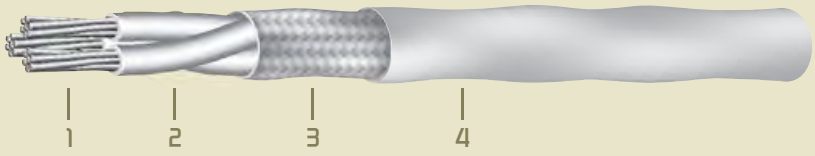
Shielded jacketed twisted triples

ESCC 3901 012

Crosslinked ETFE insulation, standard version

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Extruded crosslinked ETFE insulation,
3 - Silver plated copper shield,
4 - Extruded crosslinked ETFE insulation.

Colour to be specified when ordering (see page A–28):
black, brown, red, orange, yellow, green, blue, violet, grey, white.
Note: the colours are light.

Main characteristics

Good physical, chemical and electrical properties:

- good penetration resistance under pressure,
- good radiation resistance,
- resist large overloads with no fire risk,
- resistant to most chemicals
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 012 61*	30	7X0.10 SPCA	0.30	0.06	385.1	0.10	0.63	2.28	11.14
ESCC 3901 012 62	28	7X0.12 SPCA	0.38	0.08	244	0.10	0.69	2.43	12.69
ESCC 3901 012 63	26	19X0.10 SPCA	0.53	0.15	149	0.10	0.86	2.72	17.05
ESCC 3901 012 64	24	19X0.12 SPCA	0.66	0.25	106.2	0.10	0.99	3.01	20.42
ESCC 3901 012 65	22	19X0.15 SPC	0.79	0.40	54.3	0.10	1.14	3.35	26.06
ESCC 3901 012 66	20	19X0.20 SPC	1.04	0.60	32.3	0.10	1.37	3.81	37.29
ESCC 3901 012 67	18	19X0.25 SPC	1.29	1.00	20.3	0.10	1.63	4.40	50.94
ESCC 3901 012 68	16	19X0.30 SPC	1.55	1.20	14.8	0.10	1.90	4.91	66.79
ESCC 3901 012 69	14	37X0.25 SPC	1.82	2.00	10.2	0.10	2.29	5.82	84.76
ESCC 3901 012 70	12	37X0.32 SPC	2.28	3.00	6.51	0.10	2.74	6.86	127.02

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

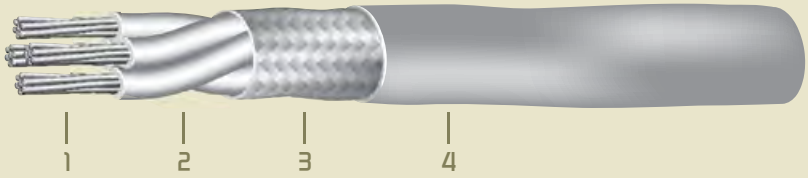
Shielded jacketed twisted quads

ESCC 3901 012

Crosslinked ETFE insulation, standard version

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Extruded crosslinked ETFE insulation,
3 - Silver plated copper shield,
4 - Extruded crosslinked ETFE insulation.

Colour to be specified when ordering (see page A–28):
black, brown, red, orange, yellow, green, blue, violet, grey, white.
Note: the colours are light.

Main characteristics

Good physical, chemical and electrical properties:

- good penetration resistance under pressure,
- good radiation resistance,
- resist large overloads with no fire risk,
- resistant to most chemicals
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 012 71*	30	7X0.10 SPCA	0.30	0.06	385.1	0.10	0.63	2.46	13.01
ESCC 3901 012 72	28	7X0.12 SPCA	0.38	0.08	244	0.10	0.69	2.64	15.05
ESCC 3901 012 73	26	19X0.10 SPCA	0.53	0.15	149	0.10	0.86	2.95	20.34
ESCC 3901 012 74	24	19X0.12 SPCA	0.66	0.25	106.2	0.10	0.99	3.27	24.50
ESCC 3901 012 75	22	19X0.15 SPC	0.79	0.40	54.3	0.10	1.14	3.65	31.72
ESCC 3901 012 76	20	19X0.20 SPC	1.04	0.60	32.3	0.10	1.37	4.16	46.25
ESCC 3901 012 77	18	19X0.25 SPC	1.29	1.00	20.3	0.10	1.63	4.80	63.76
ESCC 3901 012 78	16	19X0.30 SPC	1.55	1.20	14.8	0.10	1.90	5.37	84.44
ESCC 3901 012 79	14	37X0.25 SPC	1.82	2.00	10.2	0.10	2.29	6.40	107.94
ESCC 3901 012 80	12	37X0.32 SPC	2.28	3.00	6.51	0.10	2.74	7.57	162.98

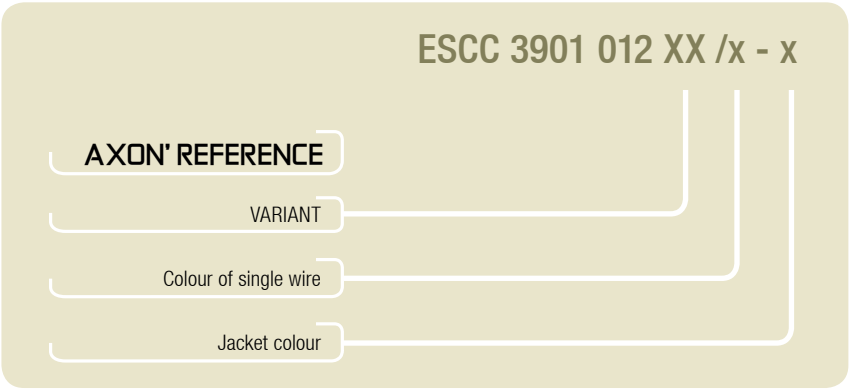
SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

ESCC 3901 012 identification code

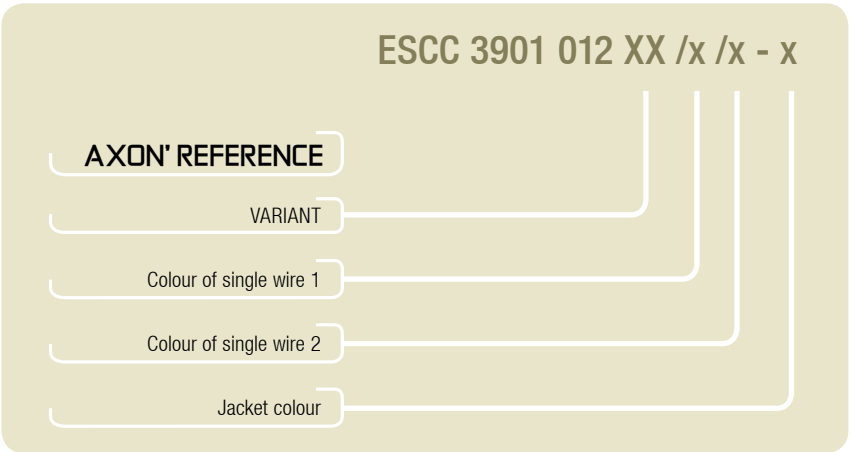
Colour to be specified when ordering

Black = 0	Brown = 1	Red = 2	Orange = 3	Yellow = 4
Green = 5	Blue = 6	Violet = 7	Grey = 8	White = 9

Single wires (PAGES A-19 AND A-23)



Twisted pairs (PAGES A-20 AND A-24)



ESCC 3901 012 identification code

Colour to be specified when ordering

Black = 0	Brown = 1	Red = 2	Orange = 3	Yellow = 4
Green = 5	Blue = 6	Violet = 7	Grey = 8	White = 9

Twisted triples (PAGES A-21 AND A-25)

ESCC 3901 012 XX /x /x /x - x

- AXON' REFERENCE
- VARIANT
- Colour of single wire 1
- Colour of single wire 2
- Colour of single wire 3
- Jacket colour

Twisted quads (PAGES A-22 AND A-26)

ESCC 3901 012 XX /x /x /x /x - x

- AXON' REFERENCE
- VARIANT
- Colour of single wire 1
- Colour of single wire 2
- Colour of single wire 3
- Colour of single wire 4
- Jacket colour

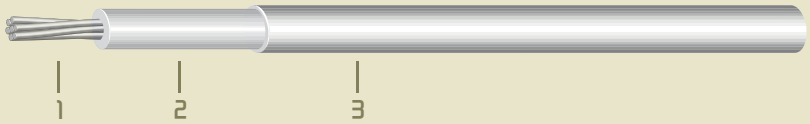
Single wires

ESCC 3901 013

PTFE / Polyimide coating

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Extruded PTFE insulation,
3 - Polyimide protective coating.
Colour: Amber (other colours on request)

Main characteristics

Excellent physical, chemical and electrical properties:
- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility and low spring back effect,
- resistant to most chemicals
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km		
ESCC 3901 013 78	30	7X0.10 SPCA	0.32	0.055	375	0.71	1.2
ESCC 3901 013 01	28	7X0.127 SPCA	0.42	0.089	215	0.82	1.8
ESCC 3901 013 02	26	7X0.16 SPCA	0.50	0.140	146	0.89	2.3
ESCC 3901 013 03	24	7X0.20 SPC	0.62	0.220	87.2	1.04	3.34
ESCC 3901 013 04	22	7X0.25 SPC	0.77	0.340	55.8	1.19	4.84
ESCC 3901 013 05	20	19X0.20 SPC	1.03	0.600	32.2	1.44	7.4
ESCC 3901 013 56	18	19X0.25 SPC	1.29	0.930	20.6	1.85	12
ESCC 3901 013 57	16	19X0.285 SPC	1.44	1.230	16.5	2.23	17

SPC: silver plated copper - SPCA: silver plated copper alloy

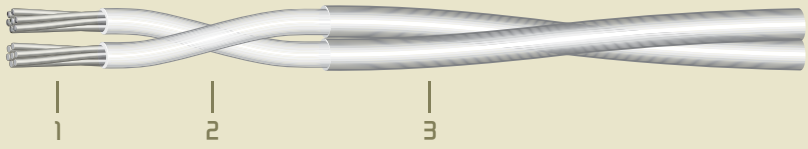
Twisted pairs

ESCC 3901 013

PTFE / Polyimide coating

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Extruded PTFE insulation,
3 - Polyimide protective coating.
Colour: Amber (other colours on request)

Main characteristics

Excellent physical, chemical and electrical properties:
- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility and low spring back effect,
- resistant to most chemicals
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 013 06	28	7X0.127 SPCA	0.42	0.089	225	0.82	1.64	3.8
ESCC 3901 013 07	26	7X0.16 SPCA	0.50	0.140	153	0.89	1.78	4.84
ESCC 3901 013 08	24	7X0.20 SPC	0.62	0.220	91.6	1.04	2.08	6.9
ESCC 3901 013 09	22	7X0.25 SPC	0.77	0.340	58.7	1.19	2.38	10
ESCC 3901 013 10	20	19X0.20 SPC	1.03	0.600	33.8	1.44	2.88	15.3
ESCC 3901 013 58	18	19X0.25 SPC	1.29	0.930	21.6	1.85	3.7	24.9
ESCC 3901 013 59	16	19X0.285 SPC	1.44	1.230	17.3	2.23	4.46	34.6

SPC: silver plated copper - SPCA: silver plated copper alloy

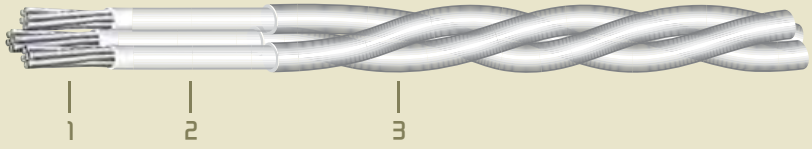
Twisted triples

ESCC 3901 013

PTFE / Polyimide coating

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Extruded PTFE insulation,
3 - Polyimide protective coating.
Colour: Amber (other colours on request)

Main characteristics

Excellent physical, chemical and electrical properties:
- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility and low spring back effect,
- resistant to most chemicals
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 013 11	28	7X0.127 SPCA	0.42	0.089	225	0.82	1.76	5.7
ESCC 3901 013 12	26	7X0.16 SPCA	0.50	0.14	153	0.89	1.92	7.28
ESCC 3901 013 13	24	7X0.20 SPC	0.62	0.22	91.6	1.04	2.24	10.35
ESCC 3901 013 14	22	7X0.25 SPC	0.77	0.34	58.7	1.19	2.56	15
ESCC 3901 013 15	20	19X0.20 SPC	1.03	0.60	33.8	1.44	3.12	23
ESCC 3901 013 60	18	19X0.25 SPC	1.29	0.93	21.6	1.85	3.98	37.3
ESCC 3901 013 61	16	19X0.285 SPC	1.44	1.23	17.3	2.23	4.8	51.8

SPC: silver plated copper - SPCA: silver plated copper alloy

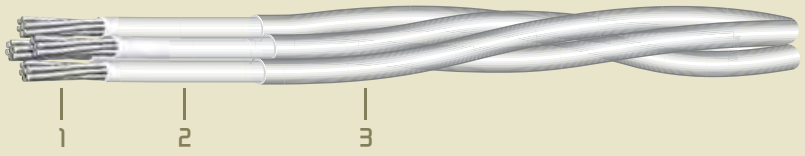
Twisted quads

ESCC 3901 013

PTFE / Polyimide coating

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Extruded PTFE insulation,
3 - Polyimide protective coating.
Colour: Amber (other colours on request)

Main characteristics

Excellent physical, chemical and electrical properties:
- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility and low spring back effect,
- resistant to most chemicals
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 013 16	28	7X0.127 SPCA	0.42	0.089	225	0.82	1.97	7.55
ESCC 3901 013 17	26	7X0.16 SPCA	0.50	0.140	153	0.89	2.14	9.71
ESCC 3901 013 18	24	7X0.20 SPC	0.62	0.220	91.6	1.04	2.5	14
ESCC 3901 013 19	22	7X0.25 SPC	0.77	0.340	58.7	1.19	2.86	20.3
ESCC 3901 013 20	20	19X0.20 SPC	1.03	0.600	33.8	1.44	3.46	31.1
ESCC 3901 013 62	18	19X0.25 SPC	1.29	0.930	21.6	1.85	4.46	49.7
ESCC 3901 013 63	16	19X0.285 SPC	1.44	1.230	17.3	2.23	5.37	69.1

SPC: silver plated copper - SPCA: silver plated copper alloy

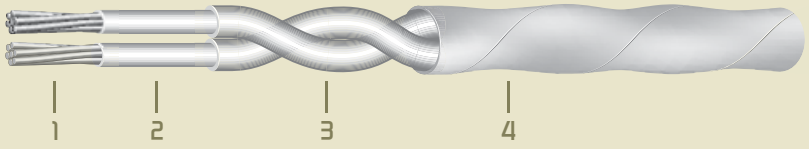
Jacketed twisted pairs

ESCC 3901 013

PTFE / Polyimide coating

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Extruded PTFE insulation,
3 - Polyimide protective coating,
4 - Polyimide tape (1 layer).
Colour: Amber (wire insulation & jacket)

Main characteristics

Excellent physical, chemical and electrical properties:
- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility and low spring back effect,
- resistant to most chemicals
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 013 21	28	7X0.127 SPCA	0.42	0.089	225	0.82	1.92	4.32
ESCC 3901 013 22	26	7X0.16 SPCA	0.50	0.140	153	0.89	2.06	5.28
ESCC 3901 013 23	24	7X0.20 SPC	0.62	0.220	91.6	1.04	2.36	7.54
ESCC 3901 013 24	22	7X0.25 SPC	0.77	0.340	58.7	1.19	2.66	10.7
ESCC 3901 013 25	20	19X0.20 SPC	1.03	0.600	33.8	1.44	3.16	16.2
ESCC 3901 013 64	18	19X0.25 SPC	1.29	0.930	21.6	1.85	3.83	26
ESCC 3901 013 65	16	19X0.285 SPC	1.44	1.230	17.3	2.23	4.63	35.8

SPC: silver plated copper - SPCA: silver plated copper alloy

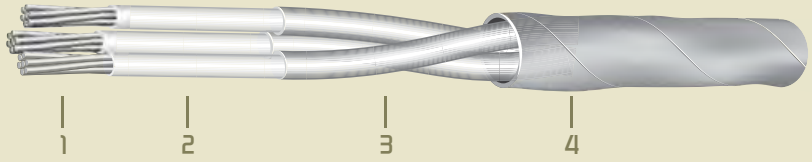
Jacketed twisted triples

ESCC 3901 013

PTFE / Polyimide coating

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Extruded PTFE insulation,
3 - Polyimide protective coating,
4 - Polyimide tape (1 layer).
Colour: Amber (wire insulation & jacket)

Main characteristics

Excellent physical, chemical and electrical properties:
- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility and low spring back effect,
- resistant to most chemicals
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 013 26	28	7X0.127 SPCA	0.42	0.089	225	0.82	2.04	6.26
ESCC 3901 013 27	26	7X0.16 SPCA	0.50	0.140	153	0.89	2.2	7.8
ESCC 3901 013 28	24	7X0.20 SPC	0.62	0.220	91.6	1.04	2.52	11
ESCC 3901 013 29	22	7X0.25 SPC	0.77	0.340	58.7	1.19	2.84	15.8
ESCC 3901 013 30	20	19X0.20 SPC	1.03	0.600	33.8	1.44	3.4	24
ESCC 3901 013 66	18	19X0.25 SPC	1.29	0.930	21.6	1.85	4.13	38.6
ESCC 3901 013 67	16	19X0.285 SPC	1.44	1.230	17.3	2.23	4.93	53.3

SPC: silver plated copper - SPCA: silver plated copper alloy

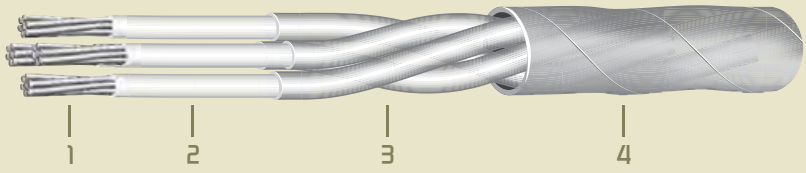
Jacketed twisted quads

ESCC 3901 013

PTFE / Polyimide coating

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Extruded PTFE insulation,
3 - Polyimide protective coating,
4 - Polyimide tape (1 layer).
Colour: Amber (wire insulation & jacket)

Main characteristics

Excellent physical, chemical and electrical properties:
- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility and low spring back effect,
- resistant to most chemicals
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 013 31	28	7X0.127 SPCA	0.42	0.089	225	0.82	2.25	8.17
ESCC 3901 013 32	26	7X0.16 SPCA	0.50	0.140	153	0.89	2.42	10.3
ESCC 3901 013 33	24	7X0.20 SPC	0.62	0.220	91.6	1.04	2.78	14.8
ESCC 3901 013 34	22	7X0.25 SPC	0.77	0.340	58.7	1.19	3.14	21.2
ESCC 3901 013 35	20	19X0.20 SPC	1.03	0.600	33.8	1.44	3.74	32.2
ESCC 3901 013 68	18	19X0.25 SPC	1.29	0.930	21.6	1.85	4.59	51.2
ESCC 3901 013 69	16	19X0.285 SPC	1.44	1.230	17.3	2.23	5.5	70.9

SPC: silver plated copper - SPCA: silver plated copper alloy

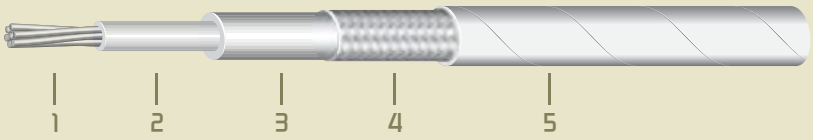
Shielded jacketed single wires

ESCC 3901 013

PTFE / Polyimide coating

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Extruded PTFE insulation,
3 - Polyimide protective coating,
4 - Silver plated copper shield,
5 - Polyimide tape (2 layers).

Colour: Amber (wire insulation & jacket)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility and low spring back effect,
- resistant to most chemicals
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 013 36	28	7X0.127 SPCA	0.42	0.089	215	0.055	0.82	1.22	3.77
ESCC 3901 013 37	26	7X0.16 SPCA	0.50	0.140	146	0.055	0.89	1.29	4.63
ESCC 3901 013 38	24	7X0.20 SPC	0.62	0.220	87.2	0.07	1.04	1.52	6.38
ESCC 3901 013 39	22	7X0.25 SPC	0.77	0.340	55.8	0.07	1.19	1.67	8.26
ESCC 3901 013 40	20	19X0.20 SPC	1.03	0.600	32.2	0.07	1.44	1.92	11.4
ESCC 3901 013 70	18	19X0.25 SPC	1.29	0.930	20.6	0.07	1.85	2.26	17
ESCC 3901 013 71	16	19X0.285 SPC	1.44	1.230	16.5	0.07	2.23	2.6	22.9

SPC: silver plated copper - SPCA: silver plated copper alloy

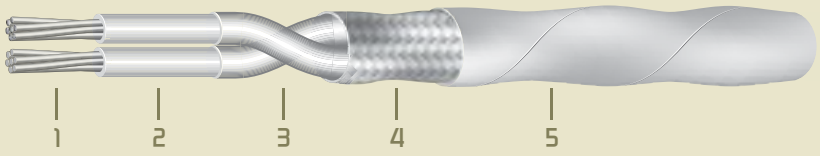
Shielded jacketed twisted pairs

ESCC 3901 013

PTFE / Polyimide coating

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Extruded PTFE insulation,
3 - Polyimide protective coating,
4 - Silver plated copper shield,
5 - Polyimide tape (2 layers).

Colour: Amber (wire insulation & jacket)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility and low spring back effect,
- resistant to most chemicals
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 013 41	28	7X0.127 SPCA	0.42	0.089	225	0.07	0.82	2.12	7.62
ESCC 3901 013 42	26	7X0.16 SPCA	0.50	0.140	153	0.07	0.89	2.26	9.24
ESCC 3901 013 43	24	7X0.20 SPC	0.62	0.220	91.6	0.07	1.04	2.56	11.7
ESCC 3901 013 44	22	7X0.25 SPC	0.77	0.340	58.7	0.07	1.19	2.86	15.5
ESCC 3901 013 45	20	19X0.20 SPC	1.03	0.600	33.8	0.07	1.44	3.36	21.7
ESCC 3901 013 72	18	19X0.25 SPC	1.29	0.930	21.6	0.1	1.85	4.23	35.5
ESCC 3901 013 73	16	19X0.285 SPC	1.44	1.230	17.3	0.1	2.23	4.98	47.8

SPC: silver plated copper - SPCA: silver plated copper alloy

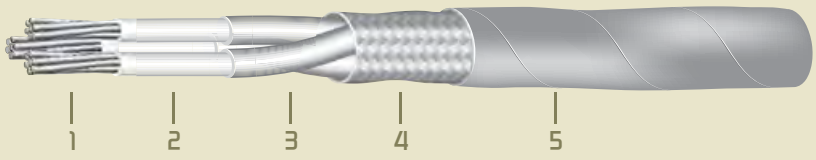
Shielded jacketed twisted triples

ESCC 3901 013

PTFE / Polyimide coating

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Extruded PTFE insulation,
3 - Polyimide protective coating,
4 - Silver plated copper shield,
5 - Polyimide tape (2 layers).

Colour: Amber (wire insulation & jacket)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility and low spring back effect,
- resistant to most chemicals
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 013 46	28	7X0.127 SPCA	0.42	0.089	225	0.07	0.82	2.24	10.7
ESCC 3901 013 47	26	7X0.16 SPCA	0.50	0.140	153	0.07	0.89	2.39	12.5
ESCC 3901 013 48	24	7X0.20 SPC	0.62	0.220	91.6	0.07	1.04	2.72	16
ESCC 3901 013 49	22	7X0.25 SPC	0.77	0.340	58.7	0.07	1.19	3.04	21.2
ESCC 3901 013 50	20	19X0.20 SPC	1.03	0.600	33.8	0.1	1.44	3.73	33.7
ESCC 3901 013 74	18	19X0.25 SPC	1.29	0.930	21.6	0.1	1.85	4.6	51
ESCC 3901 013 75	16	19X0.285 SPC	1.44	1.230	17.3	0.1	2.23	5.41	67.9

SPC: silver plated copper - SPCA: silver plated copper alloy

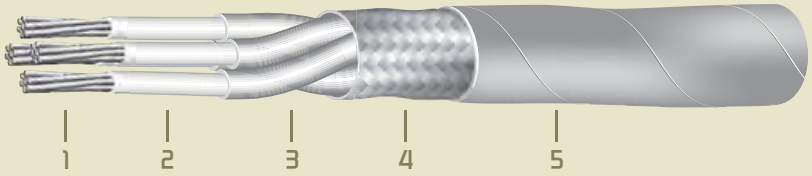
Shielded jacketed twisted quads

ESCC 3901 013

PTFE / Polyimide coating

Operating temperature: -100°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Extruded PTFE insulation,
3 - Polyimide protective coating,
4 - Silver plated copper shield,
5 - Polyimide tape (2 layers).

Colour: Amber (wire insulation & jacket)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility and low spring back effect,
- resistant to most chemicals
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 013 51	28	7X0.127 SPCA	0.42	0.089	225	0.07	0.82	2.45	12.8
ESCC 3901 013 52	26	7X0.16 SPCA	0.50	0.140	153	0.07	0.89	2.62	15.6
ESCC 3901 013 53	24	7X0.20 SPC	0.62	0.220	91.6	0.07	1.04	2.98	20.5
ESCC 3901 013 54	22	7X0.25 SPC	0.77	0.340	58.7	0.1	1.19	3.49	30.5
ESCC 3901 013 55	20	19X0.20 SPC	1.03	0.600	33.8	0.1	1.44	4.09	43.2
ESCC 3901 013 76	18	19X0.25 SPC	1.29	0.930	21.6	0.1	1.85	5.07	65.9
ESCC 3901 013 77	16	19X0.285 SPC	1.44	1.230	17.3	0.1	2.23	5.97	91.5

SPC: silver plated copper - SPCA: silver plated copper alloy

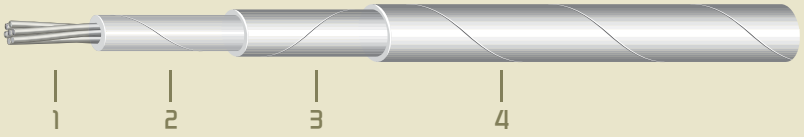
Single wires

ESCC 3901 018

CELLOFLON® / Polyimide / PTFE tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - PTFE tape.

Single wire colour: red

Except other specification: black, brown, orange, yellow, green, blue, violet, grey, white.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping,
- withstand atomic oxygen environment (ATOX).

AXON' REFERENCE	CONDUCTOR					MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km		
ESCC 3901 018 01*	32	7X0.080 SPCA	0.25	0.034	636	0.75	1.05
ESCC 3901 018 02*	30	7X0.102 SPCA	0.32	0.057	375	0.82	1.35
ESCC 3901 018 03	28	7X0.126 SPCA	0.39	0.089	239	0.9	1.81
ESCC 3901 018 04	26	7X0.160 SPCA	0.49	0.14	150	1.03	2.68
ESCC 3901 018 05	24	19X0.126 SPCA	0.65	0.24	88.9	1.18	3.78
ESCC 3901 018 06	22	19X0.160 SPC	0.82	0.38	50	1.35	5.47
ESCC 3901 018 07	20	19X0.202 SPC	1.03	0.61	30.8	1.58	8.17
ESCC 3901 018 08	16	19X0.287 SPC	1.45	1.23	15.3	2.12	15.8
ESCC 3901 018 09	12	37X0.320 SPC	2.26	2.88	6.5	2.97	35.6

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

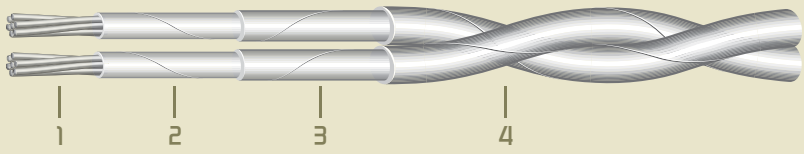
Twisted pairs

ESCC 3901 018

CELLOFLON® / Polyimide / PTFE tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - PTFE tape.

Single wire colour: red and blue

Except other specification: black, brown, orange, yellow, green, violet, grey, white.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping,
- withstand atomic oxygen environment (ATOX).

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 018 10*	32	7X0.080 SPCA	0.25	0.034	649	0.75	1.5	2.26
ESCC 3901 018 11*	30	7X0.102 SPCA	0.32	0.057	383	0.82	1.64	2.96
ESCC 3901 018 12	28	7X0.126 SPCA	0.39	0.089	244	0.9	1.8	3.87
ESCC 3901 018 13	26	7X0.160 SPCA	0.49	0.14	152	1.03	2.05	5.52
ESCC 3901 018 14	24	19X0.126 SPCA	0.65	0.24	90.7	1.18	2.36	8.09
ESCC 3901 018 15	22	19X0.160 SPC	0.82	0.38	51	1.35	2.7	11.7
ESCC 3901 018 16	20	19X0.202 SPC	1.03	0.61	31.4	1.58	3.16	17.5
ESCC 3901 018 17	16	19X0.287 SPC	1.45	1.23	15.6	2.12	4.24	33.8
ESCC 3901 018 18	12	37X0.320 SPC	2.26	2.88	6.6	2.97	5.94	76.2

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

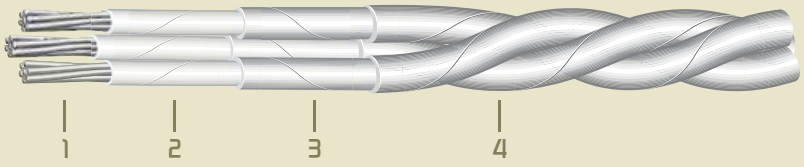
Twisted triples

ESCC 3901 018

CELLOFLON® / Polyimide / PTFE tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - PTFE tape.

Single wire colour: red, blue and yellow
Except other specification: black, brown, orange, green, violet, grey, white.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping,
- withstand atomic oxygen environment (ATOX).

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 018 19	26	7X0.160 SPCA	0.49	0.14	154	1.03	2.21	8.29
ESCC 3901 018 20	24	19X0.126 SPCA	0.65	0.24	91.6	1.18	2.54	12.1
ESCC 3901 018 21	22	19X0.160 SPC	0.82	0.38	51.5	1.35	2.9	17.6
ESCC 3901 018 22	20	19X0.202 SPC	1.03	0.61	31.7	1.58	3.4	26.2
ESCC 3901 018 23	16	19X0.287 SPC	1.45	1.23	15.8	2.12	4.56	50.7
ESCC 3901 018 24	12	37X0.320 SPC	2.26	2.88	6.7	2.97	6.39	114

SPC: silver plated copper - SPCA: silver plated copper alloy

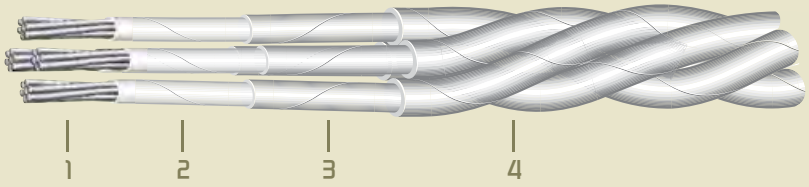
Twisted quads

ESCC 3901 018

CELLOFLON® / Polyimide / PTFE tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - PTFE tape.

Single wire colour: red, blue, yellow and green
Except other specification: black, brown, orange, violet, grey, white.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping,
- withstand atomic oxygen environment (ATOX).

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 018 25	26	7X0.160 SPCA	0.49	0.14	154	1.03	2.47	11
ESCC 3901 018 26	24	19X0.126 SPCA	0.65	0.24	91.6	1.18	2.83	16.2
ESCC 3901 018 27	22	19X0.160 SPC	0.82	0.38	51.5	1.35	3.24	23.4
ESCC 3901 018 28	20	19X0.202 SPC	1.03	0.61	31.7	1.58	3.79	35
ESCC 3901 018 29	16	19X0.287 SPC	1.45	1.23	15.8	2.12	5.09	67.6
ESCC 3901 018 30	12	37X0.320 SPC	2.26	2.88	6.7	2.97	7.13	153

SPC: silver plated copper - SPCA: silver plated copper alloy

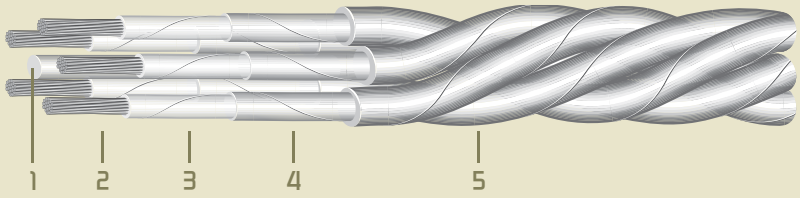
Twisted 5-core cables

ESCC 3901 018

CELLOFLON® / Polyimide / PTFE tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Filler,
2 - Stranded silver plated copper or copper alloy conductor,
3 - Expanded PTFE tape (CELLOFLON®),
4 - Polyimide tape,
5 - PTFE tape.

Single wire colour: red, blue, yellow, green and brown
Except other specification: black, orange, violet, grey, white.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping,
- withstand atomic oxygen environment (ATOX).

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 018 31	26	7X0.160 SPCA	0.49	0.14	156	1.03	2.78	14.2
ESCC 3901 018 32	24	19X0.126 SPCA	0.65	0.24	92.5	1.18	3.19	20.7
ESCC 3901 018 33	22	19X0.160 SPC	0.82	0.38	52	1.35	3.65	29.9
ESCC 3901 018 34	20	19X0.202 SPC	1.03	0.61	32	1.58	4.27	44.5

SPC: silver plated copper - SPCA: silver plated copper alloy

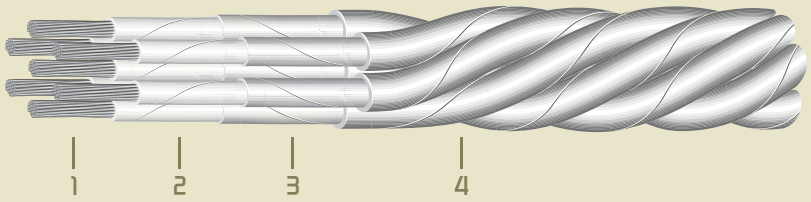
Twisted 7-core cables

ESCC 3901 018

COLLOFLON® / Polyimide / PTFE tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - PTFE tape.

Single wire colour: red, blue, yellow, green, brown, grey and white
Except other specification: black, orange, violet.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping,
- withstand atomic oxygen environment (ATOX).

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 018 35	26	7X0.160 SPCA	0.49	0.14	156	1.03	3.08	19.4
ESCC 3901 018 36	24	19X0.126 SPCA	0.65	0.24	92.5	1.18	3.54	28.3
ESCC 3901 018 37	22	19X0.160 SPC	0.82	0.38	52	1.35	4.05	39.1
ESCC 3901 018 38	20	19X0.202 SPC	1.03	0.61	32	1.58	4.74	61.3

SPC: silver plated copper - SPCA: silver plated copper alloy

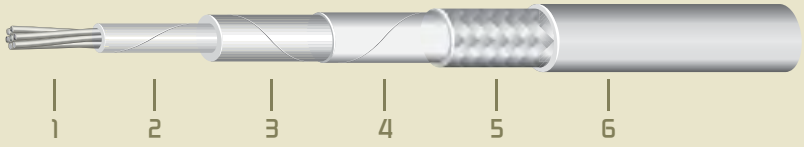
Shielded jacketed single wires

ESCC 3901 018

CELLOFLON® / Polyimide / PTFE tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - PTFE tape,
5 - Silver plated copper shield,
6 - Extruded PFA insulation.

Single wire colour: red

Except other specification: black, brown, orange, yellow, green, blue, violet, grey, white.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping,
- withstand atomic oxygen environment (ATOX).

AXON' REFERENCE	CONDUCTOR					SHIELDED STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	JACKET COLOUR	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km					
ESCC 3901 018 39*	32	7X0.080 SPCA	0.25	0.034	636	0.064	0.75	1.37	Violet	4.4
ESCC 3901 018 40*	30	7X0.102 SPCA	0.32	0.057	375	0.064	0.82	1.44	Grey	5.33
ESCC 3901 018 41	28	7X0.126 SPCA	0.39	0.089	239	0.064	0.9	1.6	Yellow	6.52
ESCC 3901 018 42	26	7X0.160 SPCA	0.49	0.14	150	0.079	1.03	1.71	Black	8.25
ESCC 3901 018 43	24	19X0.126 SPCA	0.65	0.24	88.9	0.079	1.18	1.86	Blue	9.62
ESCC 3901 018 44	22	19X0.160 SPC	0.82	0.38	50	0.079	1.35	2.04	Green	12.3
ESCC 3901 018 45	20	19X0.202 SPC	1.03	0.61	30.8	0.079	1.58	2.27	Red	15.3
ESCC 3901 018 46	16	19X0.287 SPC	1.45	1.23	15.3	0.079	2.12	2.83	Blue	25.8
ESCC 3901 018 47	12	37X0.320 SPC	2.26	2.88	6.5	0.079	2.97	3.69	Yellow	48.5

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

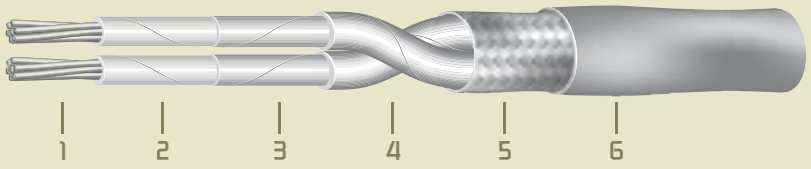
Shielded jacketed twisted pairs

ESCC 3901 018

CELLOFLON® / Polyimide / PTFE tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - PTFE tape,
5 - Silver plated copper shield,
6 - Extruded PFA insulation.

Single wire colour: red and blue

Except other specification: black, brown, orange, yellow, green, violet, grey, white.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping,
- withstand atomic oxygen environment (ATOX).

AXON' REFERENCE	CONDUCTOR					SHIELDED STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	JACKET COLOUR	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km					
ESCC 3901 018 48*	32	7X0.080 SPCA	0.25	0.034	649	0.079	0.75	2.2	Violet	9.31
ESCC 3901 018 49*	30	7X0.102 SPCA	0.32	0.057	383	0.079	0.82	2.35	Grey	11
ESCC 3901 018 50	28	7X0.126 SPCA	0.39	0.089	244	0.079	0.9	2.51	Yellow	12.2
ESCC 3901 018 51	26	7X0.160 SPCA	0.49	0.14	152	0.079	1.03	2.74	Black	15.4
ESCC 3901 018 52	24	19X0.126 SPCA	0.65	0.24	90.7	0.079	1.18	3.06	Blue	18.4
ESCC 3901 018 53	22	19X0.160 SPC	0.82	0.38	51	0.079	1.35	3.41	Green	24.2
ESCC 3901 018 54	20	19X0.202 SPC	1.03	0.61	31.4	0.079	1.58	3.87	Red	30.5
ESCC 3901 018 55	16	19X0.287 SPC	1.45	1.23	15.6	0.079	2.12	5.21	Blue	55.4
ESCC 3901 018 56	12	37X0.320 SPC	2.26	2.88	6.6	0.102	2.97	7.03	Yellow	111.0

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

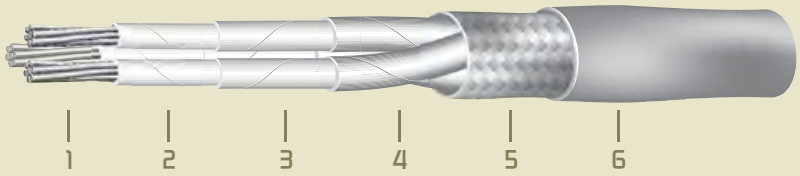
Shielded jacketed twisted triples

ESCC 3901 018

CELLOFLON® / Polyimide / PTFE tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - PTFE tape,
5 - Silver plated copper shield,
6 - Extruded PFA insulation.

Single wire colour: red, blue and yellow
Except other specification: black, brown, orange, green, violet, grey, white.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping,
- withstand atomic oxygen environment (ATOX).

AXON' REFERENCE	CONDUCTOR					SHIELDED STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	JACKET COLOUR	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km					
ESCC 3901 018 57*	32	7X0.080 SPCA	0.25	0.034	652	0.079	0.75	2.32	Violet	10.6
ESCC 3901 018 58*	30	7X0.102 SPCA	0.32	0.057	385	0.079	0.82	2.48	Grey	12.7
ESCC 3901 018 59	28	7X0.126 SPCA	0.39	0.089	245	0.079	0.9	2.66	Yellow	14.3
ESCC 3901 018 60	26	7X0.160 SPCA	0.49	0.14	152	0.079	1.03	2.9	Black	18.5
ESCC 3901 018 61	24	19X0.126 SPCA	0.65	0.24	90.7	0.079	1.18	3.23	Blue	24.5
ESCC 3901 018 62	22	19X0.160 SPC	0.82	0.38	51	0.079	1.35	3.62	Green	30.3
ESCC 3901 018 63	20	19X0.202 SPC	1.03	0.61	31.4	0.079	1.58	4.11	Red	41.4
ESCC 3901 018 64	16	19X0.287 SPC	1.45	1.23	15.6	0.102	2.12	5.53	Blue	73.0
ESCC 3901 018 65	12	37X0.320 SPC	2.26	2.88	6.6	0.102	2.97	7.49	Yellow	151.0

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

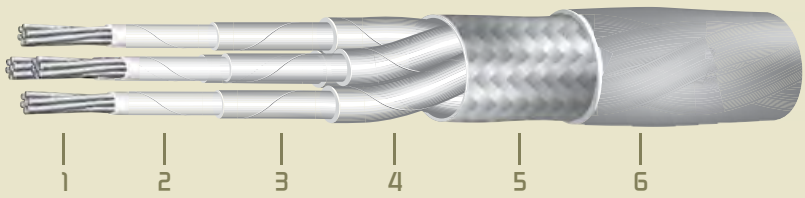
Shielded jacketed twisted quads

ESCC 3901 018

CELLOFLON® / Polyimide / PTFE tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - PTFE tape,
5 - Silver plated copper shield,
6 - Extruded PFA insulation.

Single wire colour: red, blue, yellow and green
Except other specification: black, brown, orange, violet, grey, white.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping,
- withstand atomic oxygen environment (ATOX).

AXON' REFERENCE	CONDUCTOR					SHIELDED STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	JACKET COLOUR	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km					
ESCC 3901 018 66*	32	7X0.080 SPCA	0.25	0.034	655	0.079	0.75	2.59	Violet	12.9
ESCC 3901 018 67*	30	7X0.102 SPCA	0.32	0.057	386	0.079	0.82	2.77	Grey	15.9
ESCC 3901 018 68	28	7X0.126 SPCA	0.39	0.089	246	0.079	0.9	2.98	Yellow	18
ESCC 3901 018 69	26	7X0.160 SPCA	0.49	0.14	154	0.079	1.03	3.27	Black	23.5
ESCC 3901 018 70	24	19X0.126 SPCA	0.65	0.24	91.6	0.079	1.18	3.66	Blue	29
ESCC 3901 018 71	22	19X0.160 SPC	0.82	0.38	51.5	0.079	1.35	4.1	Green	38.6
ESCC 3901 018 72	20	19X0.202 SPC	1.03	0.61	31.7	0.079	1.58	4.68	Red	52.7
ESCC 3901 018 73	16	19X0.287 SPC	1.45	1.23	15.8	0.102	2.12	6.39	Blue	101.0
ESCC 3901 018 74	12	37X0.320 SPC	2.26	2.88	6.7	0.102	2.97	8.65	Yellow	191.0

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

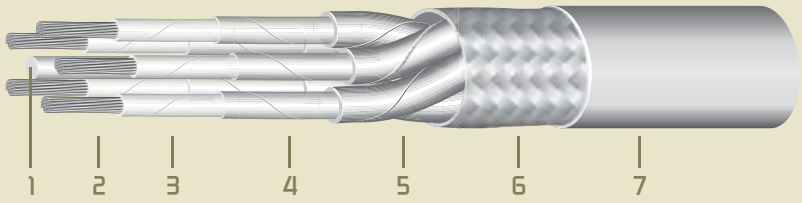
Shielded jacketed twisted 5-core cables

ESCC 3901 018

CELLOFLON® / Polyimide / PTFE tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Filler,
2 - Stranded silver plated copper or copper alloy conductor,
3 - Expanded PTFE tape (CELLOFLON®),
4 - Polyimide tape,
5 - PTFE tape,
6 - Silver plated copper shield,
7 - Extruded PFA insulation.

Single wire colour: red, blue, yellow, green and brown
Except other specification: black, orange, violet, grey, white.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping,
- withstand atomic oxygen environment (ATOX).

AXON' REFERENCE	CONDUCTOR					SHIELDED STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	JACKET COLOUR	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km					
ESCC 3901 018 75*	32	7X0.080 SPCA	0.25	0.034	661	0.079	0.75	2.74	Violet	15.6
ESCC 3901 018 76*	30	7X0.102 SPCA	0.32	0.057	390	0.079	0.82	2.95	Grey	17.8
ESCC 3901 018 77	28	7X0.126 SPCA	0.39	0.089	249	0.079	0.9	3.16	Yellow	20.4
ESCC 3901 018 78	26	7X0.160 SPCA	0.49	0.14	156	0.079	1.03	3.47	Black	26.9
ESCC 3901 018 79	24	19X0.126 SPCA	0.65	0.24	92.5	0.079	1.18	3.89	Blue	33.8
ESCC 3901 018 80	22	19X0.160 SPC	0.82	0.38	52	0.079	1.35	4.38	Green	45.4
ESCC 3901 018 81	20	19X0.202 SPC	1.03	0.61	32	0.079	1.58	5	Red	62.7

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

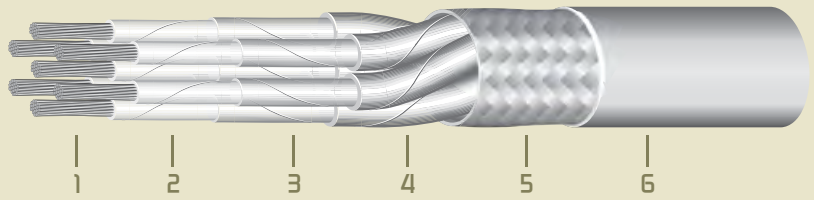
Shielded jacketed twisted 7-core cables

ESCC 3901 018

CELLOFLON® / Polyimide / PTFE tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - PTFE tape,
5 - Silver plated copper shield,
6 - Extruded PFA insulation.

Single wire colour: red, blue, yellow, green, brown, grey and white
Except other specification: black, orange, violet.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping,
- withstand atomic oxygen environment (ATOX).

AXON' REFERENCE	CONDUCTOR					SHIELDED STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	JACKET COLOUR	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km					
ESCC 3901 018 82*	32	7X0.080 SPCA	0.25	0.034	661	0.079	0.75	2.98	Violet	18.1
ESCC 3901 018 83*	30	7X0.102 SPCA	0.32	0.057	390	0.079	0.82	3.19	Grey	20.8
ESCC 3901 018 84	28	7X0.126 SPCA	0.39	0.089	249	0.079	0.9	3.44	Yellow	26.1
ESCC 3901 018 85	26	7X0.160 SPCA	0.49	0.14	156	0.079	1.03	3.78	Black	32.4
ESCC 3901 018 86	24	19X0.126 SPCA	0.65	0.24	92.5	0.079	1.18	4.25	Blue	43.7
ESCC 3901 018 87	22	19X0.160 SPC	0.82	0.38	52	0.079	1.35	4.79	Green	58.9
ESCC 3901 018 88	20	19X0.202 SPC	1.03	0.61	32	0.102	1.58	5.79	Red	89.7

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

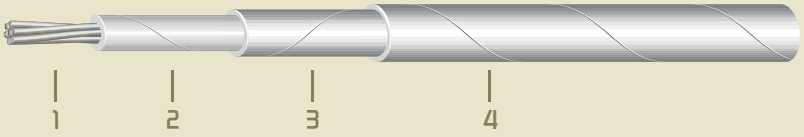
Single wires

ESCC 3901 019

CELLOFLON® / Polyimide tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - Polyimide tape.
Colour: Amber (except other specification)

Main characteristics

Excellent physical, chemical and electrical properties:
- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km		
ESCC 3901 019 01*	30	7X0.102 SPCA	0.32	0.057	375	0.78	0.98
ESCC 3901 019 02	28	7X0.127 SPCA	0.47	0.09	253	0.87	1.40
ESCC 3901 019 03	26	19X0.10 SPCA	0.57	0.15	157	0.96	1.90
ESCC 3901 019 04	24	19X0.12 SPCA	0.58	0.25	111	1.13	2.60
ESCC 3901 019 05	22	19X0.15 SPC	0.76	0.40	58	1.25	3.90
ESCC 3901 019 06	20	19X0.20 SPC	0.99	0.60	32	1.48	6.40
ESCC 3901 019 07	16	19X0.30 SPC	1.49	1.20	14	1.98	13.00
ESCC 3901 019 08	12	37X0.32 SPC	2.18	3.00	7	2.73	27.00

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

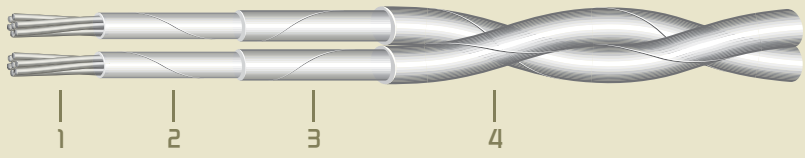
Twisted pairs

ESCC 3901 019

CELLOFLON® / Polyimide tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - Polyimide tape.

Colour: Amber (except other specification)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 019 09*	30	7X0.102 SPCA	0.32	0.057	383	0.78	1.50	2.10
ESCC 3901 019 10	28	7X0.127 SPCA	0.47	0.09	258	0.87	1.70	2.80
ESCC 3901 019 11	26	19X0.10 SPCA	0.57	0.15	170	0.96	1.90	3.80
ESCC 3901 019 12	24	19X0.12 SPCA	0.58	0.25	120	1.13	2.30	5.20
ESCC 3901 019 13	22	19X0.15 SPC	0.76	0.40	63	1.25	2.50	8.20
ESCC 3901 019 14	20	19X0.20 SPC	0.99	0.60	35	1.48	3.00	13.50
ESCC 3901 019 15	16	19X0.30 SPC	1.49	1.20	15	1.98	4.00	27.00
ESCC 3901 019 16	12	37X0.32 SPC	2.18	3.00	7.5	2.73	5.50	55.00

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

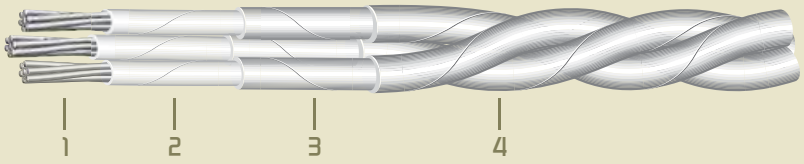
Twisted triples

ESCC 3901 019

CELLOFLON® / Polyimide tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - Polyimide tape.
Colour: Amber (except other specification)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 019 17*	30	7X0.102 SPCA	0.32	0.057	384	0.78	1.70	3.30
ESCC 3901 019 18	28	7X0.127 SPCA	0.47	0.09	259	0.87	1.90	4.50
ESCC 3901 019 19	26	19X0.10 SPCA	0.57	0.15	171	0.96	2.10	6.20
ESCC 3901 019 20	24	19X0.12 SPCA	0.58	0.25	121	1.13	2.50	8.30
ESCC 3901 019 21	22	19X0.15 SPC	0.76	0.40	64	1.25	2.70	12.70
ESCC 3901 019 22	20	19X0.20 SPC	0.99	0.60	37	1.48	3.20	20.60
ESCC 3901 019 23	16	19X0.30 SPC	1.49	1.20	15	1.98	4.30	43.00
ESCC 3901 019 24	12	37X0.32 SPC	2.18	3.00	7.5	2.73	5.90	88.00

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

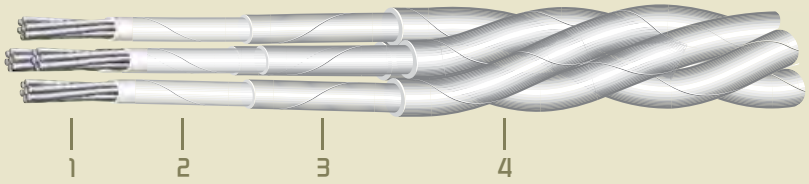
Twisted quads

ESCC 3901 019

CELLOFLON® / Polyimide tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - Polyimide tape.

Colour: Amber (except other specification)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 019 25*	30	7X0.102 SPCA	0.32	0.057	385	0.78	1.90	4.40
ESCC 3901 019 26	28	7X0.127 SPCA	0.47	0.09	260	0.87	2.10	6.00
ESCC 3901 019 27	26	19X0.10 SPCA	0.57	0.15	171	0.96	2.30	8.20
ESCC 3901 019 28	24	19X0.12 SPCA	0.58	0.25	122	1.13	2.70	11.00
ESCC 3901 019 29	22	19X0.15 SPC	0.76	0.40	64	1.25	3.00	16.90
ESCC 3901 019 30	20	19X0.20 SPC	0.99	0.60	37	1.48	3.60	27.30
ESCC 3901 019 31	16	19X0.30 SPC	1.49	1.20	16	1.98	4.80	57.00
ESCC 3901 019 32	12	37X0.32 SPC	2.18	3.00	7.9	2.73	6.50	118.00

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

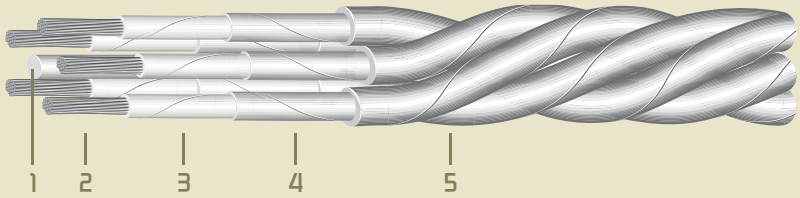
Twisted 5-core cables

ESCC 3901 019

CELLOFLON® / Polyimide tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - PTFE filler.
2 - Stranded silver plated copper or copper alloy conductor,
3 - Expanded PTFE tape (CELLOFLON®),
4 - Polyimide tape,
5 - Polyimide tape.

Colour: Amber (except other specification)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 019 33	28	7X0.127 SPCA	0.47	0.09	260	0.87	2.40	7.80
ESCC 3901 019 34	26	19X0.10 SPCA	0.57	0.15	172	0.96	2.60	10.70
ESCC 3901 019 35	24	19X0.12 SPCA	0.58	0.25	123	1.13	3.10	14.30
ESCC 3901 019 36	22	19X0.15 SPC	0.76	0.40	64	1.25	3.40	21.80
ESCC 3901 019 37	20	19X0.20 SPC	0.99	0.60	37	1.48	4.00	35.00

SPC: silver plated copper - SPCA: silver plated copper alloy

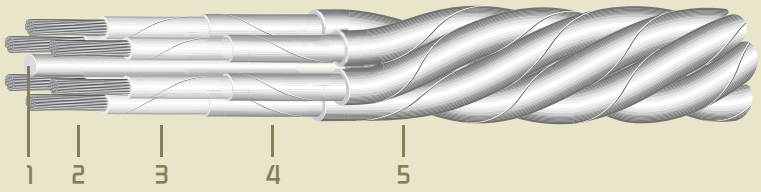
Twisted 6-core cables

ESCC 3901 019

CELLOFLON® / Polyimide tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - PTFE filler,
2 - Stranded silver plated copper or copper alloy conductor,
3 - Expanded PTFE tape (CELLOFLON®),
4 - Polyimide tape,
5 - Polyimide tape.

Colour: Amber (except other specification)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 019 38	28	7X0.127 SPCA	0.47	0.09	261	0.87	2.60	9.60
ESCC 3901 019 39	26	19X0.10 SPCA	0.57	0.15	172	0.96	2.90	13.10
ESCC 3901 019 40	24	19X0.12 SPCA	0.58	0.25	124	1.13	3.40	17.60
ESCC 3901 019 41	22	19X0.15 SPC	0.76	0.40	65	1.25	3.70	26.60
ESCC 3901 019 42	20	19X0.20 SPC	0.99	0.60	38	1.48	4.40	48.20

SPC: silver plated copper - SPCA: silver plated copper alloy

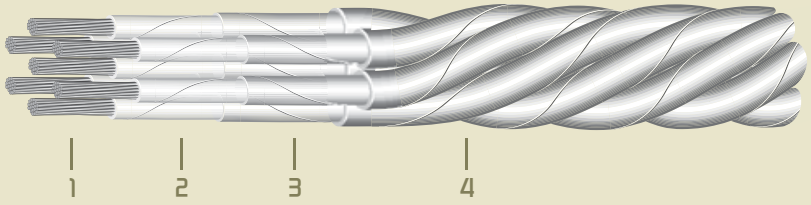
Twisted 7-core cables

ESCC 3901 019

CELLOFLON® / Polyimide tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - Polyimide tape.

Colour: Amber (except other specification)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 019 43	28	7X0.127 SPCA	0.47	0.09	261	0.87	2.60	10.50
ESCC 3901 019 44	26	19X0.10 SPCA	0.57	0.15	172	0.96	2.90	14.40
ESCC 3901 019 45	24	19X0.12 SPCA	0.58	0.25	124	1.13	3.40	19.30
ESCC 3901 019 46	22	19X0.15 SPC	0.76	0.40	65	1.25	3.70	29.60
ESCC 3901 019 47	20	19X0.20 SPC	0.99	0.60	38	1.48	4.40	47.80

SPC: silver plated copper - SPCA: silver plated copper alloy

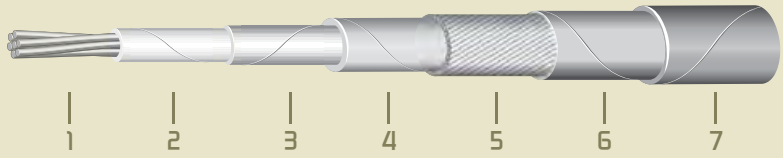
Shielded jacketed single wires

ESCC 3901 019

CELLOFLON® / Polyimide tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - Polyimide tape,
5 - Silver plated copper helicoidal shield,
6 - Polyimide tape,
7 - Polyimide tape.

Colour: Amber (except other specification)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 019 48*	30	7X0.102 SPCA	0.32	0.057	375	0.063	0.78	1.10	2.60
ESCC 3901 019 49	28	7X0.127 SPCA	0.47	0.09	253	0.079	0.87	1.20	3.30
ESCC 3901 019 50	26	19X0.10 SPCA	0.57	0.15	157	0.079	0.96	1.30	4.10
ESCC 3901 019 51	24	19X0.12 SPCA	0.58	0.25	111	0.079	1.13	1.50	4.80
ESCC 3901 019 52	22	19X0.15 SPC	0.76	0.40	58	0.079	1.25	1.60	6.30
ESCC 3901 019 53	20	19X0.20 SPC	0.99	0.60	32	0.079	1.48	1.90	9.10
ESCC 3901 019 54	16	19X0.30 SPC	1.49	1.20	14	0.079	1.98	2.40	16.80
ESCC 3901 019 55	12	37X0.32 SPC	2.18	3.00	7	0.079	2.73	3.10	31.70

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

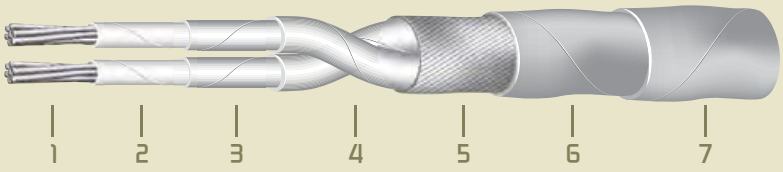
Shielded jacketed twisted pairs

ESCC 3901 019

CELLOFLON® / Polyimide tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - Polyimide tape,
5 - Silver plated copper helicoidal shield,
6 - Polyimide tape,
7 - Polyimide tape.

Colour: Amber (except other specification)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 019 56*	30	7X0.102 SPCA	0.32	0.057	383	0.063	0.78	1.90	5.10
ESCC 3901 019 57	28	7X0.127 SPCA	0.47	0.09	258	0.079	0.87	2.10	6.10
ESCC 3901 019 58	26	19X0.10 SPCA	0.57	0.15	170	0.079	0.96	2.30	7.70
ESCC 3901 019 59	24	19X0.12 SPCA	0.58	0.25	120	0.079	1.13	2.70	9.50
ESCC 3901 019 60	22	19X0.15 SPC	0.76	0.40	63	0.079	1.25	2.90	13.40
ESCC 3901 019 61	20	19X0.20 SPC	0.99	0.60	35	0.079	1.48	3.30	19.60
ESCC 3901 019 62	16	19X0.30 SPC	1.49	1.20	15	0.079	1.98	4.30	35.00
ESCC 3901 019 63	12	37X0.32 SPC	2.18	3.00	7.50	0.079	2.73	5.80	67.00

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

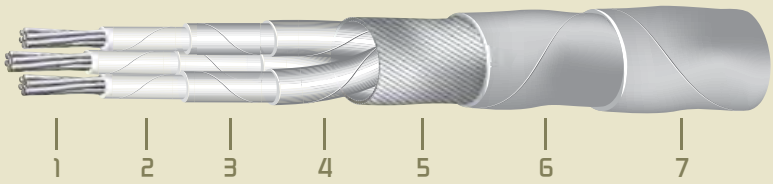
Shielded jacketed twisted triples

ESCC 3901 019

CELLOFLON® / Polyimide tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - Polyimide tape,
5 - Silver plated copper helicoidal shield,
6 - Polyimide tape,
7 - Polyimide tape.

Colour: Amber (except other specification)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	Overall MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 019 64*	30	7X0.102 SPCA	0.32	0.057	385	0.063	0.78	2.00	6.10
ESCC 3901 019 65	28	7X0.127 SPCA	0.47	0.09	259	0.079	0.87	2.30	8.30
ESCC 3901 019 66	26	19X0.10 SPCA	0.57	0.15	171	0.079	0.96	2.40	10.30
ESCC 3901 019 67	24	19X0.12 SPCA	0.58	0.25	121	0.079	1.13	2.80	13.20
ESCC 3901 019 68	22	19X0.15 SPC	0.76	0.40	64	0.079	1.25	3.10	18
ESCC 3901 019 69	20	19X0.20 SPC	0.99	0.60	37	0.079	1.48	3.60	26.80
ESCC 3901 019 70	16	19X0.30 SPC	1.49	1.20	15	0.079	1.98	4.60	51
ESCC 3901 019 71	12	37X0.32 SPC	2.18	3.00	7.50	0.079	2.73	6.20	99

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

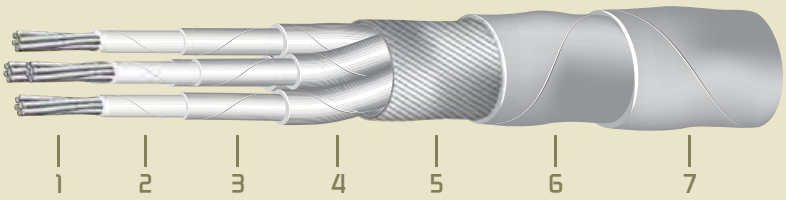
Shielded jacketed twisted quads

ESCC 3901 019

CELLOFLON® / Polyimide tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - Polyimide tape,
5 - Silver plated copper helicoidal shield,
6 - Polyimide tape,
7 - Polyimide tape.

Colour: Amber (except other specification)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 019 72*	30	7X0.102 SPCA	0.32	0.057	386	0.063	0.78	2.20	7.60
ESCC 3901 019 73	28	7X0.127 SPCA	0.47	0.09	260	0.079	0.87	2.50	10.40
ESCC 3901 019 74	26	19X0.10 SPCA	0.57	0.15	171	0.079	0.96	2.70	12.20
ESCC 3901 019 75	24	19X0.12 SPCA	0.58	0.25	122	0.079	1.13	3.10	16.40
ESCC 3901 019 76	22	19X0.15 SPC	0.76	0.40	64	0.079	1.25	3.40	22.90
ESCC 3901 019 77	20	19X0.20 SPC	0.99	0.60	37	0.079	1.48	3.90	34.40
ESCC 3901 019 78	16	19X0.30 SPC	1.49	1.20	16	0.079	1.98	5.10	63
ESCC 3901 019 79	12	37X0.32 SPC	2.18	3.00	7.90	0.079	2.73	6.90	124

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

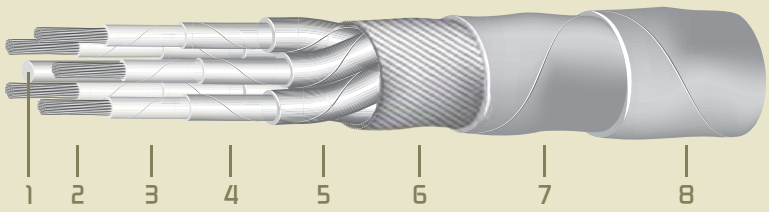
Shielded jacketed twisted 5-core cables

ESCC 3901 019

CELLOFLON® / Polyimide tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - PTFE filler,
2 - Stranded silver plated copper or copper alloy conductor,
3 - Expanded PTFE tape (CELLOFLON®),
4 - Polyimide tape,
5 - Polyimide tape,
6 - Silver plated copper helicoidal shield,
7 - Polyimide tape,
8 - Polyimide tape.

Colour: Amber (except other specification)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 019 80	28	7X0.127 SPCA	0.47	0.09	260	0.079	0.87	2.70	12.50
ESCC 3901 019 81	26	19X0.10 SPCA	0.57	0.15	172	0.079	0.96	2.90	15.80
ESCC 3901 019 82	24	19X0.12 SPCA	0.58	0.25	123	0.079	1.13	3.40	20.40
ESCC 3901 019 83	22	19X0.15 SPC	0.76	0.40	64	0.079	1.25	3.70	28.40
ESCC 3901 019 84	20	19X0.20 SPC	0.99	0.60	37	0.079	1.48	4.40	43.00

SPC: silver plated copper - SPCA: silver plated copper alloy

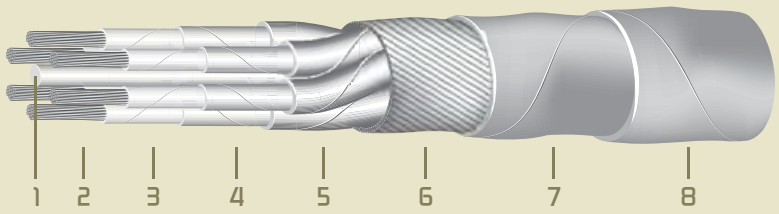
Shielded jacketed twisted 6-core cables

ESCC 3901 019

CELLOFLON® / Polyimide tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - PTFE filler,
2 - Stranded silver plated copper or copper alloy conductor,
3 - Expanded PTFE tape (CELLOFLON®),
4 - Polyimide tape,
5 - Polyimide tape,
6 - Silver plated copper helicoidal shield,
7 - Polyimide tape,
8 - Polyimide tape.

Colour: Amber (except other specification)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 019 85	28	7X0.127 SPCA	0.47	0.09	261	0.079	0.87	3.00	14.80
ESCC 3901 019 86	26	19X0.10 SPCA	0.57	0.15	172	0.079	0.96	3.20	18.80
ESCC 3901 019 87	24	19X0.12 SPCA	0.58	0.25	124	0.079	1.13	3.80	24.30
ESCC 3901 019 88	22	19X0.15 SPC	0.76	0.40	65	0.079	1.25	4.10	34.00
ESCC 3901 019 89	20	19X0.20 SPC	0.99	0.60	38	0.079	1.48	4.80	58.20

SPC: silver plated copper - SPCA: silver plated copper alloy

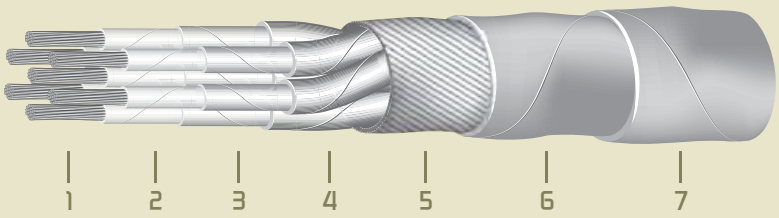
Shielded jacketed twisted 7-core cables

ESCC 3901 019

CELLOFLON® / Polyimide tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - Polyimide tape,
5 - Silver plated copper helicoidal shield,
6 - Polyimide tape,
7 - Polyimide tape.

Colour: Amber (except other specification)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 019 90	28	7X0.127 SPCA	0.47	0.09	261	0.079	0.87	3.0	15.7
ESCC 3901 019 91	26	19X0.10 SPCA	0.57	0.15	172	0.079	0.96	3.2	20.1
ESCC 3901 019 92	24	19X0.12 SPCA	0.58	0.25	124	0.079	1.13	3.8	26
ESCC 3901 019 93	22	19X0.15 SPC	0.76	0.40	65	0.079	1.25	4.1	37
ESCC 3901 019 94	20	19X0.20 SPC	0.99	0.60	38	0.079	1.48	4.8	57

SPC: silver plated copper - SPCA: silver plated copper alloy

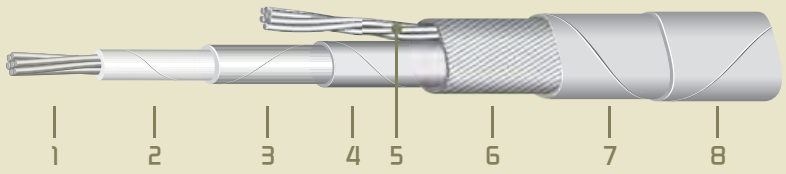
Shielded jacketed single wires

ESCC 3901 021

CELLOFLON® / Polyimide tape / Drain / Shielding / Jacket

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - Polyimide tape,
5 - Drain wire,
6 - Silver plated copper helicoidal shield,
7 - Polyimide tape,
8 - Polyimide tape.

Single wire colour: Natural (or other specification) – Jacket colour: Amber (natural colour of polyimide tape)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	DRAIN & CONDUCTOR		CONDUCTOR			SHIELD STRAND MAX. Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 021 01*	30	7X0.102 SPCA	0.32	0.057	375	0.063	0.78	1.4	3.4
ESCC 3901 021 02	28	7X0.127 SPCA	0.39	0.09	253	0.079	0.87	1.6	4.4
ESCC 3901 021 03	26	19X0.10 SPCA	0.47	0.15	157	0.079	0.99	1.8	5.8
ESCC 3901 021 04	24	19X0.12 SPCA	0.58	0.25	111	0.079	1.13	2.1	7.4
ESCC 3901 021 05	22	19X0.15 SPC	0.76	0.40	58	0.079	1.26	2.4	11
ESCC 3901 021 06	20	19X0.20 SPC	0.99	0.60	32	0.079	1.48	2.9	17
ESCC 3901 021 07	18	19X0.25 SPC	1.29	0.96	21	0.079	1.70	3.9	30
ESCC 3901 021 08	16	19X0.30 SPC	1.49	1.20	14	0.079	1.98	4.0	34
ESCC 3901 021 09	12	37X0.32 SPC	2.18	3.00	7	0.079	2.70	5.3	66

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

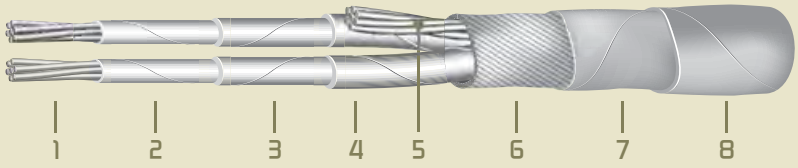
Shielded jacketed twisted pairs

ESCC 3901 021

CELLOFLON® / Polyimide tape / Drain / Shielding / Jacket

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - Polyimide tape,
5 - Drain wire,
6 - Silver plated copper helicoidal shield,
7 - Polyimide tape,
8 - Polyimide tape.

Single wire colour: Red and natural (or other specification)
Jacket colour: Amber (natural colour of polyimide tape)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	DRAIN & CONDUCTOR		CONDUCTOR			SHIELD STRAND MAX. Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 021 10*	30	7X0.102 SPCA	0.32	0.057	383	0.063	0.78	2.2	5.7
ESCC 3901 021 11	28	7X0.127 SPCA	0.39	0.09	258	0.079	0.87	2.5	7
ESCC 3901 021 12	26	19X0.10 SPCA	0.47	0.15	170	0.079	0.99	2.8	9.1
ESCC 3901 021 13	24	19X0.12 SPCA	0.58	0.21	120	0.079	1.13	3.3	11.4
ESCC 3901 021 14	22	19X0.15 SPC	0.76	0.40	63	0.079	1.26	3.7	17
ESCC 3901 021 15	20	19X0.20 SPC	0.99	0.60	35	0.079	1.48	4.3	25
ESCC 3901 021 16	16	19X0.30 SPC	1.49	1.20	15	0.079	1.98	5.9	48
ESCC 3901 021 17	12	37X0.32 SPC	2.18	3.00	7.5	0.079	2.73	8.0	95

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

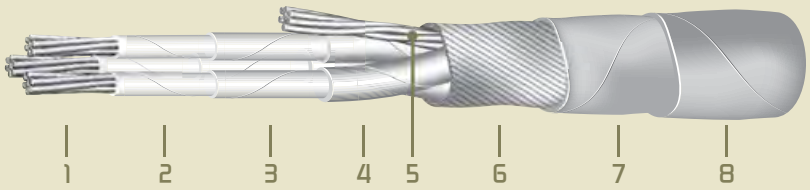
Shielded jacketed twisted triples

ESCC 3901 021

CELLOFLON® / Polyimide tape / Drain / Shielding / Jacket

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - Polyimide tape,
5 - Drain wire,
6 - Silver plated copper helicoidal shield,
7 - Polyimide tape,
8 - Polyimide tape.

Single wire colour: Red, natural and yellow (or other specification)
Jacket colour: Amber (natural colour of polyimide tape)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	DRAIN & CONDUCTOR		CONDUCTOR			SHIELD STRAND MAX. Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 021 18*	30	7X0.102 SPCA	0.32	0.057	385	0.063	0.78	2.3	6.7
ESCC 3901 021 19	28	7X0.127 SPCA	0.39	0.09	259	0.079	0.87	2.7	9.2
ESCC 3901 021 20	26	19X0.10 SPCA	0.47	0.15	171	0.079	0.99	2.9	12
ESCC 3901 021 21	24	19X0.12 SPCA	0.58	0.25	121	0.079	1.13	3.4	15
ESCC 3901 021 22	22	19X0.15 SPC	0.76	0.40	64	0.079	1.26	3.9	21
ESCC 3901 021 23	20	19X0.20 SPC	0.99	0.60	37	0.079	1.48	4.6	33

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

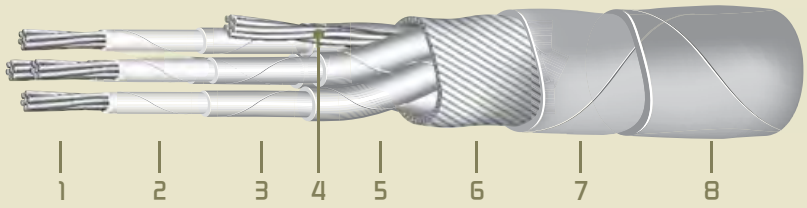
Shielded jacketed twisted quads

ESCC 3901 021

CELLOFLON® / Polyimide tape / Drain / Shielding / Jacket

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - Drain wire,
5 - Polyimide tape,
6 - Silver plated copper helicoidal shield,
7 - Polyimide tape,
8 - Polyimide tape.

Single wire colour: Red, natural, yellow and green (or other specification)
Jacket colour: Amber (natural colour of polyimide tape)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	DRAIN & CONDUCTOR		CONDUCTOR			SHIELD STRAND MAX. Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 021 24*	30	7X0.102 SPCA	0.32	0.057	386	0.063	0.78	2.5	8.2
ESCC 3901 021 25	28	7X0.127 SPCA	0.39	0.09	260	0.079	0.87	2.9	11
ESCC 3901 021 26	26	19X0.10 SPCA	0.47	0.15	171	0.079	0.99	3.2	14
ESCC 3901 021 27	24	19X0.12 SPCA	0.58	0.25	122	0.079	1.13	3.7	18
ESCC 3901 021 28	22	19X0.15 SPC	0.76	0.40	64	0.079	1.26	4.2	26
ESCC 3901 021 29	20	19X0.20 SPC	0.99	0.60	37	0.079	1.48	4.9	40

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

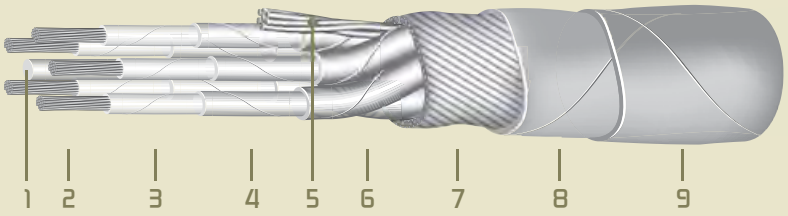
Shielded jacketed twisted 5-core cables

ESCC 3901 021

CELLOFLON® / Polyimide tape / Drain / Shielding / Jacket

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Filler,
2 - Stranded silver plated copper or copper alloy conductor,
3 - Expanded PTFE tape (CELLOFLON®),
4 - Polyimide tape,
5 - Drain wire,
6 - Polyimide tape,
7 - Silver plated copper helicoidal shield,
8 - Polyimide tape,
9 - Polyimide tape.

Single wire colour: Red, natural, yellow, green and brown (or other specification)
Jacket colour: Amber (natural colour of polyimide tape)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	DRAIN & CONDUCTOR		CONDUCTOR			SHIELD STRAND MAX. Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 021 30	26	19X0.10 SPCA	0.47	0.15	172	0.079	0.99	3.4	17
ESCC 3901 021 31	24	19X0.12 SPCA	0.58	0.25	123	0.079	1.13	4.0	22
ESCC 3901 021 32	22	19X0.15 SPC	0.76	0.40	64	0.079	1.26	4.5	32
ESCC 3901 021 33	20	19X0.20 SPC	0.99	0.60	37	0.079	1.48	5.4	49

SPC: silver plated copper - SPCA: silver plated copper alloy

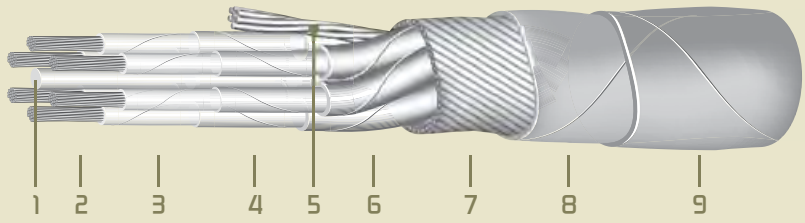
Shielded jacketed twisted 6-core cables

ESCC 3901 021

CELLOFLON® / Polyimide tape / Drain / Shielding / Jacket

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Filler,
2 - Stranded silver plated copper or copper alloy conductor,
3 - Expanded PTFE tape (CELLOFLON®),
4 - Polyimide tape,
5 - Drain wire,
6 - Polyimide tape,
7 - Silver plated copper helicoidal shield,
8 - Polyimide tape,
9 - Polyimide tape.

Single wire colour: Red, natural, yellow, green, brown and black (or other specification)

Jacket colour: Amber (natural colour of polyimide tape)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	DRAIN & CONDUCTOR		CONDUCTOR			SHIELD STRAND MAX. Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 021 34	26	19X0.10 SPCA	0.47	0.15	172	0.079	0.99	3.7	20
ESCC 3901 021 35	24	19X0.12 SPCA	0.58	0.25	124	0.079	1.13	4.4	26
ESCC 3901 021 36	22	19X0.15 SPC	0.76	0.40	65	0.079	1.26	4.9	37
ESCC 3901 021 37	20	19X0.20 SPC	0.99	0.60	38	0.079	1.48	5.8	62

SPC: silver plated copper - SPCA: silver plated copper alloy

ESA
WIRES & CABLES

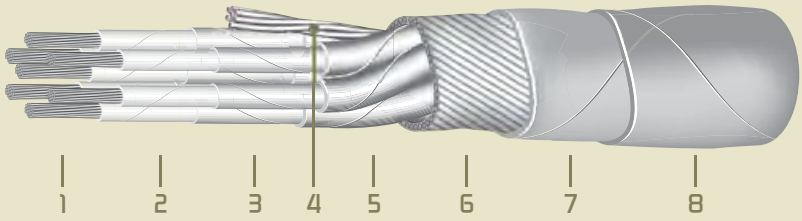
Shielded jacketed twisted 7-core cables

ESCC 3901 021

CELLOFLON® / Polyimide tape / Drain / Shielding / Jacket

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded PTFE tape (CELLOFLON®),
3 - Polyimide tape,
4 - Drain wire,
5 - Polyimide tape,
6 - Silver plated copper helicoidal shield,
7 - Polyimide tape,
8 - Polyimide tape.

Single wire colour: Red, natural, yellow, green, brown, black and orange (or other specification)
Jacket colour: Amber (natural colour of polyimide tape)

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent radiation resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	DRAIN & CONDUCTOR		CONDUCTOR			SHIELD STRAND MAX. Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 021 38	26	19X0.10 SPCA	0.47	0.15	172	0.079	0.99	3.7	22
ESCC 3901 021 39	24	19X0.12 SPCA	0.58	0.25	124	0.079	1.13	4.4	28
ESCC 3901 021 40	22	19X0.15 SPC	0.76	0.40	65	0.079	1.26	4.9	40
ESCC 3901 021 41	20	19X0.20 SPC	0.99	0.60	38	0.079	1.48	5.8	65

SPC: silver plated copper - SPCA: silver plated copper alloy

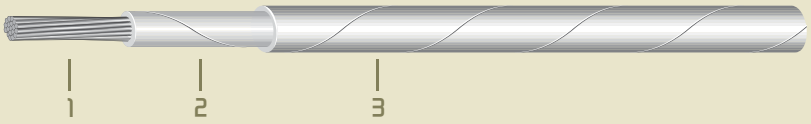
Single wires

ESCC 3901 024

Abrasion resistant PTFE tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Abrasion resistant PTFE tape,
3 - Abrasion resistant PTFE tape.
Single wire colour: Red
Except other specification: black, brown, orange, yellow, green, blue, violet, grey, white.

Main characteristics

Excellent physical, chemical and electrical properties:
- excellent penetration resistance under pressure,
- excellent abrasion resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility and very low spring back effect,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km		
ESCC 3901 024 01*	30	7X0.102 SPCA	0.32	0.057	375	0.75	1.3
ESCC 3901 024 02	28	7X0.127 SPCA	0.39	0.09	253	0.85	1.7
ESCC 3901 024 03	26	19X0.10 SPCA	0.47	0.15	157	1.00	2.2
ESCC 3901 024 04	24	19X0.12 SPCA	0.58	0.25	111	1.15	3.1
ESCC 3901 024 05	22	19X0.15 SPC	0.76	0.40	58	1.30	4.4
ESCC 3901 024 06	20	19X0.20 SPC	0.99	0.60	32	1.55	7.4
ESCC 3901 024 07	16	19X0.30 SPC	1.49	1.20	14	2.20	17
ESCC 3901 024 08	12	37X0.32 SPC	2.18	3.00	7	3.00	33

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

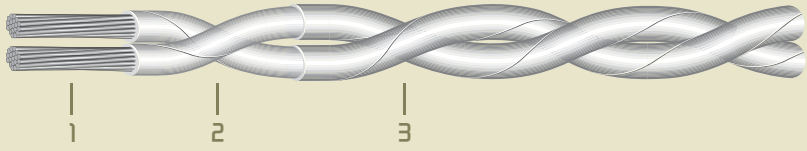
Twisted pairs

ESCC 3901 024

Abrasion resistant PTFE tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Abrasion resistant PTFE tape,
3 - Abrasion resistant PTFE tape.

Single wire colour: Red and blue

Except other specification: black, brown, orange, yellow, green, violet, grey, white.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent abrasion resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility and very low spring back effect,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 024 09*	30	7X0.102 SPCA	0.32	0.057	383	0.75	1.5	2.7
ESCC 3901 024 10	28	7X0.127 SPCA	0.39	0.09	258	0.85	1.7	3.5
ESCC 3901 024 11	26	19X0.10 SPCA	0.47	0.15	170	1.00	2.0	4.6
ESCC 3901 024 12	24	19X0.12 SPCA	0.58	0.25	120	1.15	2.3	6.5
ESCC 3901 024 13	22	19X0.15 SPC	0.76	0.40	63	1.30	2.6	9.2
ESCC 3901 024 14	20	19X0.20 SPC	0.99	0.60	35	1.55	3.1	15.5
ESCC 3901 024 15	16	19X0.30 SPC	1.49	1.20	15	2.20	4.4	35.7
ESCC 3901 024 16	12	37X0.32 SPC	2.18	3.00	7.5	3.00	6.0	69.3

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

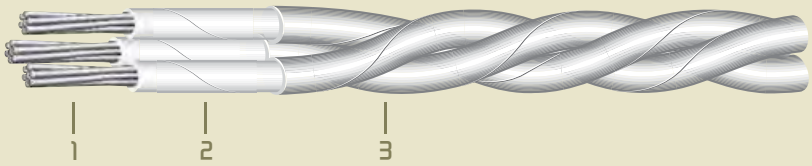
Twisted triples

ESCC 3901 024

Abrasion resistant PTFE tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Abrasion resistant PTFE tape,
3 - Abrasion resistant PTFE tape.

Single wire colour: Red, blue and yellow
Except other specification: black, brown, orange, green, violet, grey, white.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent abrasion resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility and very low spring back effect,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 024 17*	30	7X0.102 SPCA	0.32	0.057	384	0.75	1.6	4.1
ESCC 3901 024 18	28	7X0.127 SPCA	0.39	0.09	259	0.85	1.8	5.3
ESCC 3901 024 19	26	19X0.10 SPCA	0.47	0.15	171	1.00	2.2	6.9
ESCC 3901 024 20	24	19X0.12 SPCA	0.58	0.25	121	1.15	2.5	9.8
ESCC 3901 024 21	22	19X0.15 SPC	0.76	0.40	64	1.30	2.8	13.9
ESCC 3901 024 22	20	19X0.20 SPC	0.99	0.60	37	1.55	3.3	23.3
ESCC 3901 024 23	16	19X0.30 SPC	1.49	1.20	15	2.20	4.7	53.6
ESCC 3901 024 24	12	37X0.32 SPC	2.18	3.00	7.5	3.00	6.5	104

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

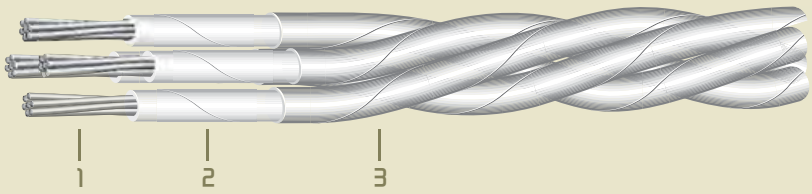
Twisted quads

ESCC 3901 024

Abrasion resistant PTFE tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Abrasion resistant PTFE tape,
3 - Abrasion resistant PTFE tape.

Single wire colour: Red, blue, yellow and green
Except other specification: black, brown, orange, violet, grey, white.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent abrasion resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility and very low spring back effect,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km			
ESCC 3901 024 25*	30	7X0.102 SPCA	0.32	0.057	385	0.75	1.8	5.4
ESCC 3901 024 26	28	7X0.127 SPCA	0.39	0.09	260	0.85	2.0	7.1
ESCC 3901 024 27	26	19X0.10 SPCA	0.47	0.15	171	1.00	2.4	9.2
ESCC 3901 024 28	24	19X0.12 SPCA	0.58	0.25	122	1.15	2.8	13.0
ESCC 3901 024 29	22	19X0.15 SPC	0.76	0.40	64	1.30	3.1	18.5
ESCC 3901 024 30	20	19X0.20 SPC	0.99	0.60	37	1.55	3.7	31.1
ESCC 3901 024 31	16	19X0.30 SPC	1.49	1.20	16	2.20	5.3	71.4
ESCC 3901 024 32	12	37X0.32 SPC	2.18	3.00	7.9	3.00	7.2	138.6

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

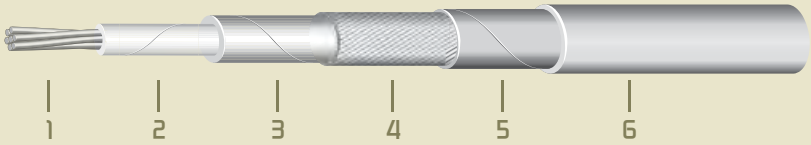
Shielded jacketed single wires

ESCC 3901 024

Abrasion resistant PTFE tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Abrasion resistant PTFE tape,
3 - Abrasion resistant PTFE tape,
4 - Silver plated copper helicoidal shield,
5 - Expanded PTFE tape,
6 - Extruded PFA insulation.

Single wire colour: Red)

Except other specification: black, brown, orange, yellow, green, blue, violet, grey, white.

Jacket colour: White

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent abrasion resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility and very low spring back effect,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND MAX. Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 024 33*	30	7X0.102 SPCA	0.32	0.057	383	0.079	0.75	1.35	4.3
ESCC 3901 024 34	28	7X0.127 SPCA	0.39	0.09	258	0.079	0.85	1.45	5.0
ESCC 3901 024 35	26	19X0.10 SPCA	0.47	0.15	170	0.079	1.00	1.60	6.0
ESCC 3901 024 36	24	19X0.12 SPCA	0.58	0.25	120	0.079	1.15	1.75	7.3
ESCC 3901 024 37	22	19X0.15 SPC	0.76	0.40	63	0.079	1.30	1.9	9.1
ESCC 3901 024 38	20	19X0.20 SPC	0.99	0.60	35	0.079	1.55	2.15	12.8
ESCC 3901 024 39	16	19X0.30 SPC	1.49	1.20	15	0.079	2.20	2.8	24
ESCC 3901 024 40	12	37X0.32 SPC	2.18	3.00	7.5	0.079	3.00	3.6	42.8

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

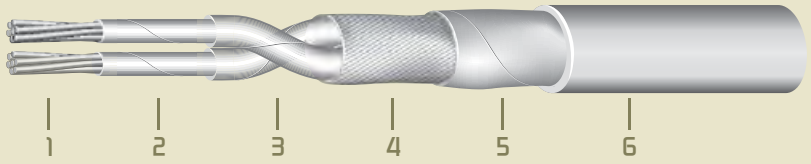
Shielded jacketed twisted pairs

ESCC 3901 024

Abrasion resistant PTFE tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Abrasion resistant PTFE tape,
3 - Abrasion resistant PTFE tape,
4 - Silver plated copper helicoidal shield,
5 - Expanded PTFE tape,
6 - Extruded PFA insulation.

Single wire colour: Red and blue
Except other specification: black, brown, orange, yellow, green, violet, grey, white.
Jacket colour: White

Main characteristics

Excellent physical, chemical and electrical properties:
- excellent penetration resistance under pressure,
- excellent abrasion resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility and very low spring back effect,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND MAX. Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 024 41*	30	7X0.102 SPCA	0.32	0.057	383	0.079	0.75	2.1	7.3
ESCC 3901 024 42	28	7X0.127 SPCA	0.39	0.09	258	0.079	0.85	2.3	8.5
ESCC 3901 024 43	26	19X0.10 SPCA	0.49	0.15	170	0.079	1.00	2.6	10.0
ESCC 3901 024 44	24	19X0.12 SPCA	0.58	0.25	120	0.079	1.15	2.9	12.5
ESCC 3901 024 45	22	19X0.15 SPC	0.76	0.40	63	0.079	1.30	3.2	16.0
ESCC 3901 024 46	20	19X0.20 SPC	0.99	0.60	35	0.079	1.55	3.7	24.2
ESCC 3901 024 47	16	19X0.30 SPC	1.49	1.20	15	0.079	2.20	5.0	44.5
ESCC 3901 024 48	12	37X0.32 SPC	2.18	3.00	7.5	0.079	3.00	6.6	81.0

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

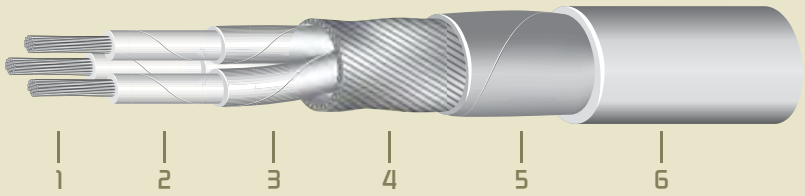
Shielded jacketed twisted triples

ESCC 3901 024

Abrasion resistant PTFE tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Abrasion resistant PTFE tape,
3 - Abrasion resistant PTFE tape,
4 - Silver plated copper helicoidal shield,
5 - Expanded PTFE tape,
6 - Extruded PFA insulation.

Single wire colour: Red, blue and yellow
Except other specification: black, brown, orange, green, violet, grey, white.
Jacket colour: White

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent abrasion resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility and very low spring back effect,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND MAX. Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 024 49*	30	7X0.102 SPCA	0.32	0.057	385	0.079	0.75	2.2	9
ESCC 3901 024 50	28	7X0.127 SPCA	0.39	0.09	259	0.079	0.85	2.4	10.6
ESCC 3901 024 51	26	19X0.10 SPCA	0.47	0.15	171	0.079	1.00	2.8	12.7
ESCC 3901 024 52	24	19X0.12 SPCA	0.58	0.25	121	0.079	1.15	3.1	15.9
ESCC 3901 024 53	22	19X0.15 SPC	0.76	0.40	64	0.079	1.30	3.4	24.3
ESCC 3901 024 54	20	19X0.20 SPC	0.99	0.60	37	0.079	1.55	3.9	33.0
ESCC 3901 024 55	16	19X0.30 SPC	1.49	1.20	15	0.079	2.20	5.3	62.2
ESCC 3901 024 56	12	37X0.32 SPC	2.18	3.00	7.5	0.079	3.00	7.0	115.5

SPC: silver plated copper - SPCA: silver plated copper alloy -*=according to the ESA standard

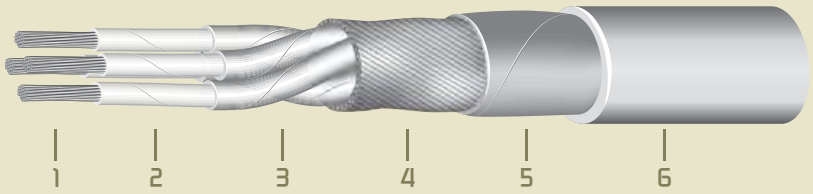
Shielded jacketed twisted quads

ESCC 3901 024

Abrasion resistant PTFE tape

Operating temperature: -200°C up to +200°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Abrasion resistant PTFE tape,
3 - Abrasion resistant PTFE tape,
4 - Silver plated copper helicoidal shield,
5 - Expanded PTFE tape,
6 - Extruded PFA insulation.

Single wire colour: Red, blue, yellow and green
Except other specification: black, brown, orange, violet, grey, white.
Jacket colour: White

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- excellent abrasion resistance,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility and very low spring back effect,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping.

AXON' REFERENCE	CONDUCTOR					SHIELD STRAND MAX. Ø mm	SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
	AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km				
ESCC 3901 024 57*	30	7X0.102 SPCA	0.32	0.057	386	0.079	0.75	2.4	10.9
ESCC 3901 024 58	28	7X0.127 SPCA	0.39	0.09	260	0.079	0.85	2.6	13.0
ESCC 3901 024 59	26	19X0.10 SPCA	0.47	0.15	171	0.079	1.00	3.0	15.7
ESCC 3901 024 60	24	19X0.12 SPCA	0.58	0.25	122	0.079	1.15	3.4	20.2
ESCC 3901 024 61	22	19X0.15 SPC	0.76	0.40	64	0.079	1.30	3.7	26.4
ESCC 3901 024 62	20	19X0.20 SPC	0.99	0.60	37	0.079	1.55	4.3	42.0
ESCC 3901 024 63	16	19X0.30 SPC	1.49	1.20	16	0.079	2.20	5.9	80.7
ESCC 3901 024 64	12	37X0.32 SPC	2.18	3.00	7.9	0.079	3.00	7.8	151.5

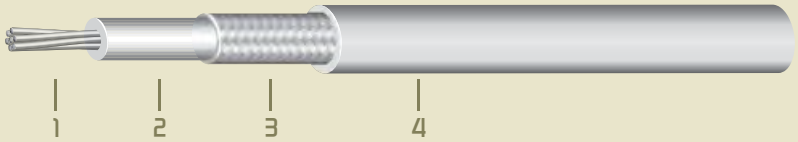
SPC: silver plated copper - SPCA: silver plated copper alloy - *=according to the ESA standard

Coaxial cable

ESCC 3902 002

CELLOFLON® dielectric

Operating temperature: -200°C up to +180°C.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded microporous PTFE (CELLOFLON® - colour: natural),
3 - Silver plated copper braided shield,
4 - Extruded PFA insulation.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping,
- controlled impedance for optimal data transmission.

AXON' REFERENCE	ZC Ω	INNER CONDUCTOR			DIELECTRIC	JACKET		
		AWG	MAX. Ø mm	MAX. DC RESISTANCE AT 20°C Ω / km	NOM. Ø mm	MAX. Ø mm	JACKET COLOUR	MAX. WEIGHT g/m
ESCC 3902 002 03	50	28	0.39	239	1.05	1.75	White	6.5
ESCC 3902 002 04	50	26	0.49	150	1.25	2.05	Orange	8.3
ESCC 3902 002 05	50	20	1.03	30.8	3.0	3.9	Green	28
ESCC 3902 002 06	75	26	0.49	150	2.07	2.9	Black	14

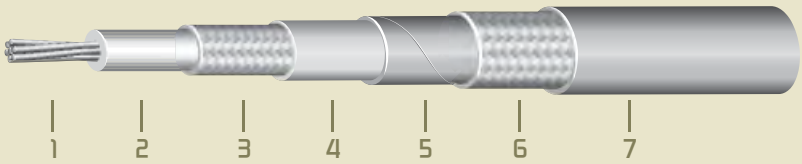
SPC: silver plated copper - SPCA: silver plated copper alloy

Triaxial cable

ESCC 3902 002

CELLOFLON® dielectric

Operating temperature: -200°C up to +180°C.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Expanded microporous PTFE (CELLOFLON® - colour: natural),
3 - Silver plated copper braided shield,
4 - Extruded PFA insulation (colour: natural),
5 - Wrapped foil shield (**only var. 13**),
6 - Silver plated copper braided shield,
7 - Extruded PFA insulation.

Main characteristics

Excellent physical, chemical and electrical properties:

- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping,
- controlled impedance for optimal data transmission.

AXON' REFERENCE	ZC Ω	INNER CONDUCTOR			DIELECTRIC	INNER JACKET MAX. Ø mm	COAXIAL CABLE		
		AWG	MAX. Ø mm	MAX. DC RESISTANCE AT 20°C Ω / km	NOM. Ø mm		MAX. Ø mm	JACKET COLOUR	MAX. WEIGHT g/m
ESCC 3902 002 10	50	26	0.49	150	1.25	1.9	2.9	Orange	16
ESCC 3902 002 11	50	20	1.03	30.8	3.0	3.8	5.2	Green	52
ESCC 3902 002 12	75	20	1.03	30.8	4.33	5.2	7.3	Natural	74
ESCC 3902 002 13	75	20	1.03	30.8	4.33	5.2	7.3	White	85

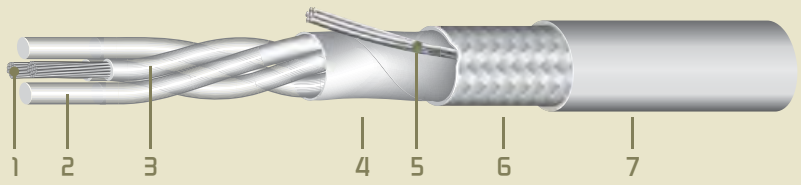
SPC: silver plated copper - SPCA: silver plated copper alloy

Databus cable

ESCC 3902 002

CELLOFLON® dielectric

Operating temperature: -200°C up to +180°C.



Construction

1 - Stranded silver plated copper or copper alloy conductor,
2 - Filler (**except var. 26**): Expanded PTFE (CELLOFLON®),
3 - Dielectric: Expanded PTFE (CELLOFLON®). **Except var. 20**: wrapped PTFE),
4 - Binder (**only var. 22 & 26 to 30**): Wrapped expanded PTFE (CELLOFLON®),
5 - Drain wire (**except var. 26 to 30**): Stranded silver plated copper or copper alloy,
6 - Silver plated copper shield,
7 - Extruded PFA insulation.

Main characteristics

Excellent physical, chemical and electrical properties:
- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping,
- controlled impedance for optimal data transmission.

AXON' REFERENCE	ZC Ω	INNER CONDUCTOR			DIELECTRIC		SHIELD Ø mm	JACKET		MAX. WEIGHT g/m
		AWG	MAX. Ø mm	MAX. DC RESISTANCE AT 20°C Ω / km	NOM. Ø mm	COLOUR		MAX. Ø mm	COLOUR	
ESCC 3902 002 20	75	24	0.65	95	1.2	■/□	2.4	3.9	■	24
ESCC 3902 002 21	100	22	0.82	54	2.1	■/■	4.2	5.2	■	36
ESCC 3902 002 22	120	30	0.32	401	0.8	□	1.6	2.8	■	14
ESCC 3902 002 23	120	28	0.39	256	1.3	□	2.6	3.3	■	18
ESCC 3902 002 24	120	26	0.49	159	1.6	■/■	3.2	3.8	■	21
ESCC 3902 002 25	120	24	0.65	89	2.1	■/■	4.2	5.3	■	32
ESCC 3902 002 26	100	30	0.32	401	0.85	□	1.7	2.2	■	11
ESCC 3902 002 27	100	28	0.39	256	0.89	□	1.78	2.9	■	14
ESCC 3902 002 28	100	26	0.49	159	1.1	□	2.2	3.1	■	18
ESCC 3902 002 29	100	24	0.65	89	1.5	□	3.0	3.9	■	22
ESCC 3902 002 30	100	22	0.82	54	1.8	□	3.6	4.8	■	28

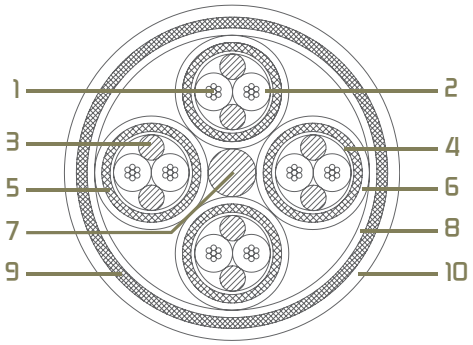
SPC: silver plated copper - SPCA: silver plated copper alloy

Spacewire quadribus cable

ESCC 3902 003

CELLOFLON® dielectric / PFA jacket

Operating temperature: -200°C up to +180°C.



Construction

1 - Stranded silver plated copper alloy conductor,
2 - Dielectric: Expanded microporous PTFE,
3 - Filler: Expanded microporous PTFE,
4 - Binder (**only var. 02**): Wrapped microporous PTFE,
5 - Silver plated copper braided shield,
6 - Extruded PFA insulation,
7 - Filler: Expanded microporous PTFE,
8 - Binder: Wrapped microporous PTFE,
9 - Silver plated copper braided shield,
10 - Extruded PFA insulation.

Main characteristics

Excellent physical, chemical and electrical properties:

- Designed to meet nominal transmission performances of Spacewire protocol,
- excellent penetration resistance under pressure,
- resist large overloads with no fire risk,
- non-flammable,
- good flexibility,
- resistant to most chemicals,
- suited for thermal, mechanical or laser stripping,
- controlled impedance for optimal data transmission.

AXON' REFERENCE	ZC Ω	INNER CONDUCTOR					SINGLE WIRE		SYMMETRIC CABLE SHIELD STRAND Ø mm
		AWG	STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km	MAX. Ø mm	DIELECTRIC COLOUR	
ESCC 3902 003 01	100	28	7x0.127 SPCA	0.39	0.089	256	1.2	Blue / White	0.079
ESCC 3902 003 02	100	26	7x0.160 SPCA	0.49	0.141	159	1.4	Blue / White	0.079

AXON' REFERENCE	SYMMETRIC CABLE			ROUND CABLE					MIN. BEND RADIUS
	BINDER NOM. THICKNESS mm	MAX. Ø mm	MAX. WEIGHT g/m	BINDER NOM. THICKNESS mm	SHIELD STRAND Ø mm	MAX. Ø mm	JACKET COLOUR	MAX. WEIGHT g/m	
ESCC 3902 003 01	-	2.7	12	0.102	0.102	7.5	White	85	90
ESCC 3902 003 02	0.076	3.1	15	0.102	0.102	9	Blue	100	120

SPC: silver plated copper - SPCA: silver plated copper alloy

AXALU®

aluminium conductors and shields

AXALU®

Silverplated aluminium conductors and shields for light weight on-board wires and cables

AXON' has developed a whole range of silverplated aluminium conductors and shielding wires brandnamed AXALU®. Used for the manufacture of satellite data transmission and battery power distribution, AXALU® wires allow for a 50 to 60% weight saving regarding conductor and shielding in comparison with copper wires.

Due to the low atomic mass, AXALU® has also an advantage for the manufacture of shieldings with exposure to radiation (x-rays).

AXALU® ALLOWS FOR WEIGHT SAVING

Comparison Aluminium / Copper

	SP Aluminium	SP Copper
Dimensions	AWG 40 (solid) to AWG 6 (stranded)	AWG 50 to 4
Conductivity (% IACS)	63	100
Tensile strength (MPa)	150	240
Temperature rating (°C)	150	200
Density	2.7	8.89
Termination techniques	soldering / crimping	soldering / crimping
Weight saving	50% to 60%	

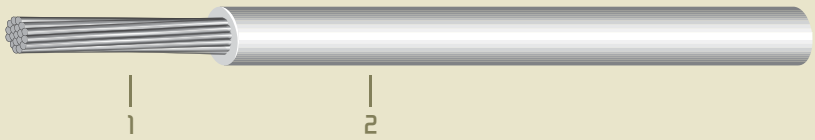
Single wires

AXALU® / aluminium wires

Crosslinked ETFE insulation

Operating temperature: -100°C up to +150°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated aluminium conductor.
2 - Extruded crosslinked ETFE insulation.

Main characteristics

- 30 to 40 % weight saving compared to equivalent copper wires,
- good cut-through resistance,
- good resistance to radiation,
- good X-Ray response.

AXON' REFERENCE	AWG	CONDUCTOR				SINGLE WIRE MAX. Ø mm	MAX. WEIGHT g/m
		STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km		
AXL 1 M 2419 AS1	24	19x0.12	0.62	0.215	145	0.83	1.22
AXL 1 M 2219 AS1	22	19x0.15	0.77	0.336	92	1.00	1.70
AXL 1 M 2019 AS1	20	19x0.20	1.02	0.597	52	1.25	2.65
AXL 1 M 1819 AS1	18	19x0.25	1.27	0.933	33	1.50	3.83
AXL 1 M 1619 AS1	16	19x0.30	1.52	1.343	23	1.85	5.63
AXL 1 M 1437 AS1	14	37x0.25	1.77	1.816	17	2.22	8.08
AXL 1 M 1237 AS1	12	37x0.32	2.26	2.98	10.30	2.82	12.88
AXL 1 M 1037 AS1	10	37x0.405	2.86	4.77	6.40	3.57	20.41
AXL 1 M 8133 AS1	8	133x0.287	4.34	8.6	3.60	4.97	34.27

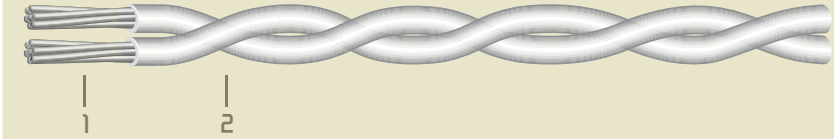
Twisted pairs

AXALU® / aluminium wires

Crosslinked ETFE insulation

Operating temperature: -100°C up to +150°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated aluminium conductor.
2 - Extruded crosslinked ETFE insulation.

Main characteristics

- 30 to 40 % weight saving compared to equivalent copper wires,
- good cut-through resistance,
- good resistance to radiation,
- good X-Ray response.

AXON' REFERENCE	AWG	CONDUCTOR				SINGLE WIRE MAX. Ø mm	BUNDLE MAX. Ø mm	MAX. WEIGHT g/m
		STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm²	MAX. DC RESISTANCE AT 20°C Ω / km			
AXL 1 M 2419 AS2	24	19x0.12	0.62	0.215	150	0.83	1.66	2.56
AXL 1 M 2219 AS2	22	19x0.15	0.77	0.336	95	1.00	2.00	3.51
AXL 1 M 2019 AS2	20	19x0.20	1.02	0.597	53	1.25	2.50	5.45
AXL 1 M 1819 AS2	18	19x0.25	1.27	0.933	34	1.50	3.00	7.89
AXL 1 M 1619 AS2	16	19x0.30	1.52	1.343	23.5	1.85	3.70	11.6
AXL 1 M 1437 AS2	14	37x0.25	1.77	1.816	17.4	2.22	4.50	16.65
AXL 1 M 1237 AS2	12	37x0.32	2.26	2.98	10.6	2.82	5.70	26.54
AXL 1 M 1037 AS2	10	37x0.405	2.86	4.77	6.6	3.57	7.20	42.05
AXL 1 M 8133 AS2	8	133x0.287	4.34	8.6	3.7	4.97	10.00	71.00

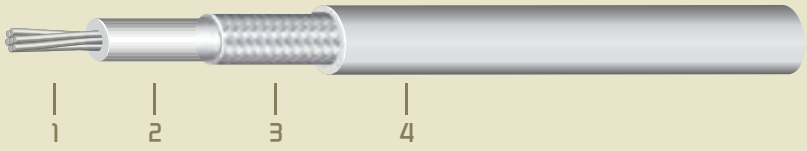
Shielded jacketed single wires

AXALU® / aluminium wires

Crosslinked ETFE insulation

Operating temperature: -100°C up to +150°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated aluminium conductor.
2 - Extruded crosslinked ETFE insulation.
3 - Silver plated aluminium braided shield.
4 - Extruded crosslinked ETFE insulation outer jacket.

Main characteristics

- 30 to 40 % weight saving compared to equivalent copper wires,
- good cut-through resistance,
- good resistance to radiation,
- good EMI protection,
- good X-Ray response.

AXON' REFERENCE	AWG	CONDUCTOR				SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
		STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km				
AXL 1 M 2419 AS1C	24	19x0.12	0.62	0.215	145	0.1	0.83	1.60	3.86
AXL 1 M 2219 AS1C	22	19x0.15	0.77	0.336	92	0.1	1.00	1.77	4.55
AXL 1 M 2019 AS1C	20	19x0.20	1.02	0.597	52	0.1	1.25	2.02	6.15
AXL 1 M 1819 AS1C	18	19x0.25	1.27	0.933	33	0.1	1.50	2.26	8.02

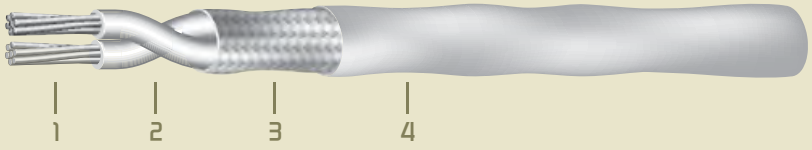
Shielded jacketed twisted pairs

AXALU® / aluminium wires

Crosslinked ETFE insulation

Operating temperature: -100°C up to +150°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated aluminium conductor.
2 - Extruded crosslinked ETFE insulation.
3 - Silver plated aluminium braided shield.
4 - Extruded crosslinked ETFE insulation outer jacket.

Main characteristics

- 30 to 40 % weight saving compared to equivalent copper wires,
- good cut-through resistance,
- good resistance to radiation,
- good EMI protection,
- good X-Ray response.

AXON' REFERENCE	AWG	CONDUCTOR				SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
		STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km				
AXL 1 M 2419 AS2C	24	19x0.12	0.62	0.215	150	0.1	0.83	2.48	7.20
AXL 1 M 2219 AS2C	22	19x0.15	0.77	0.336	95	0.1	1.00	2.82	8.93
AXL 1 M 2019 AS2C	20	19x0.20	1.02	0.597	53	0.1	1.25	3.32	11.86
AXL 1 M 1819 AS2C	18	19x0.25	1.27	0.933	34	0.1	1.50	3.82	15.31

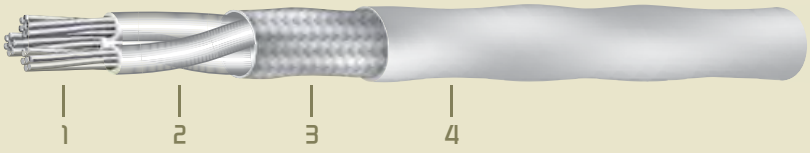
Shielded jacketed twisted triples

AXALU® / aluminium wires

Crosslinked ETFE insulation

Operating temperature: -100°C up to +150°C

Voltage rating: 600 VAC max.



Construction

1 - Stranded silver plated aluminium conductor.
2 - Extruded crosslinked ETFE insulation.
3 - Silver plated aluminium braided shield.
4 - Extruded crosslinked ETFE insulation outer jacket.

Main characteristics

- 30 to 40 % weight saving compared to equivalent copper wires,
- good cut-through resistance,
- good resistance to radiation,
- good EMI protection,
- good X-Ray response.

AXON' REFERENCE	AWG	CONDUCTOR				SHIELD STRAND Ø mm	SINGLE WIRE MAX. Ø mm	OVERALL MAX. Ø mm	MAX. WEIGHT g/m
		STRANDING Nb x Ø mm	MAX. Ø mm	NOM. CROSS SECTION mm^2	MAX. DC RESISTANCE AT 20°C Ω / km				
AXL 1 M 2419 AS3C	24	19x0.12	0.62	0.215	150	0.1	0.83	2.65	9.00
AXL 1 M 2219 AS3C	22	19x0.15	0.77	0.336	95	0.1	1.00	3.02	11.32
AXL 1 M 2019 AS3C	20	19x0.20	1.02	0.597	53	0.1	1.25	3.55	15.48
AXL 1 M 1819 AS3C	18	19x0.25	1.27	0.933	34	0.1	1.50	4.09	20.58

QUASI-FLEX®
hand-formable
semi rigid substitute

www.axon-cable.com

axon'
cable & interconnect

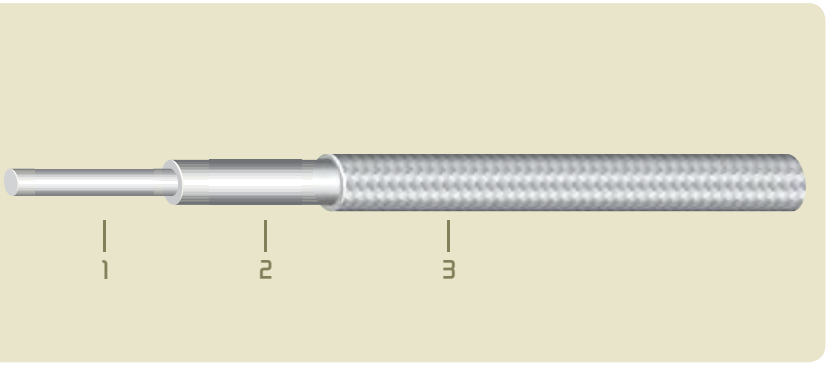
QUASI-FLEX®

hand-formable semi-rigid substitute

QUASI-FLEX® has been designed to replace semi-rigid cables whilst retaining similar electrical performances. The copper tube normally used on these cables has been replaced by an optimised tin soaked braided shield. QUASI-FLEX® cables are used to interconnect antennae and active elements, for example repeaters in the payload of a satellite.

QUASI-FLEX® cables have the following properties:

- Excellent memory properties.
- Easy to install hand-formable cable due to the optimised tin soaked shield.



Construction

Cable

1 - Inner conductor (SPCW or SPC).
2 - Dielectric: solid PTFE.
3 - Shield: tin soaked silver plated copper braid (2µm silver).

A protective jacket can be added over the braid.
The components used are manufactured according to ESCC-Q70-71A rev 1.
Operating temperature: -55°C/+150°C

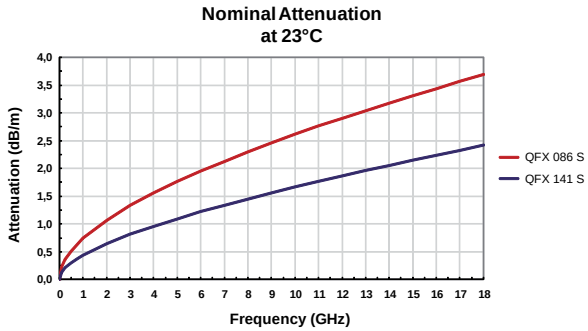
Connection

QUASI-FLEX® cables are fully compatible with standard SMA connectors for semi-rigid cables. Installation procedures are identical.

CABLE REFERENCE	INNER CONDUCTOR		DIELECTRIC		SHIELDING	
	NATURE	Ø mm	NATURE	Ø mm	NATURE	Ø mm
QFX 086 S - P540264	SPCW	0.51	PTFE	1.65	SPC	2.20
QFX 141 S - P540262	SPC	0.92	PFTE	2.95	SPC	3.58

Electrical characteristics

		QFX 086 S	QFX 141 S
IMPEDANCE (Ω)		50 ± 2	50 ± 2
CAPACITANCE (pF/m)		97	97
PROPAGATION VELOCITY (%)		69	69
WORKING VOLTAGE - MAX (V_{RMS})		1500	2500
INSULATION RESISTANCE		10^5 MΩ	10^5 MΩ
ATTENUATION (dB/m)	@ 1 GHz	0.74	0.44
(NOMINAL VALUES)	@ 3 GHz	1.33	0.81
	@ 5 GHz	1.76	1.09
	@ 10 GHz	2.61	1.66
	@ 18 GHz	3.69	2.42

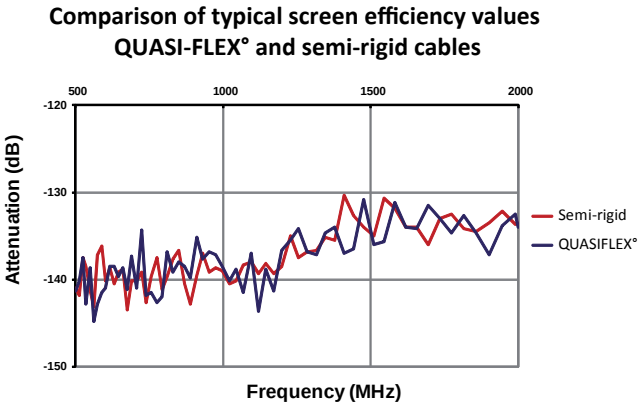


QUASI-FLEX® WITH SMA CONNECTOR

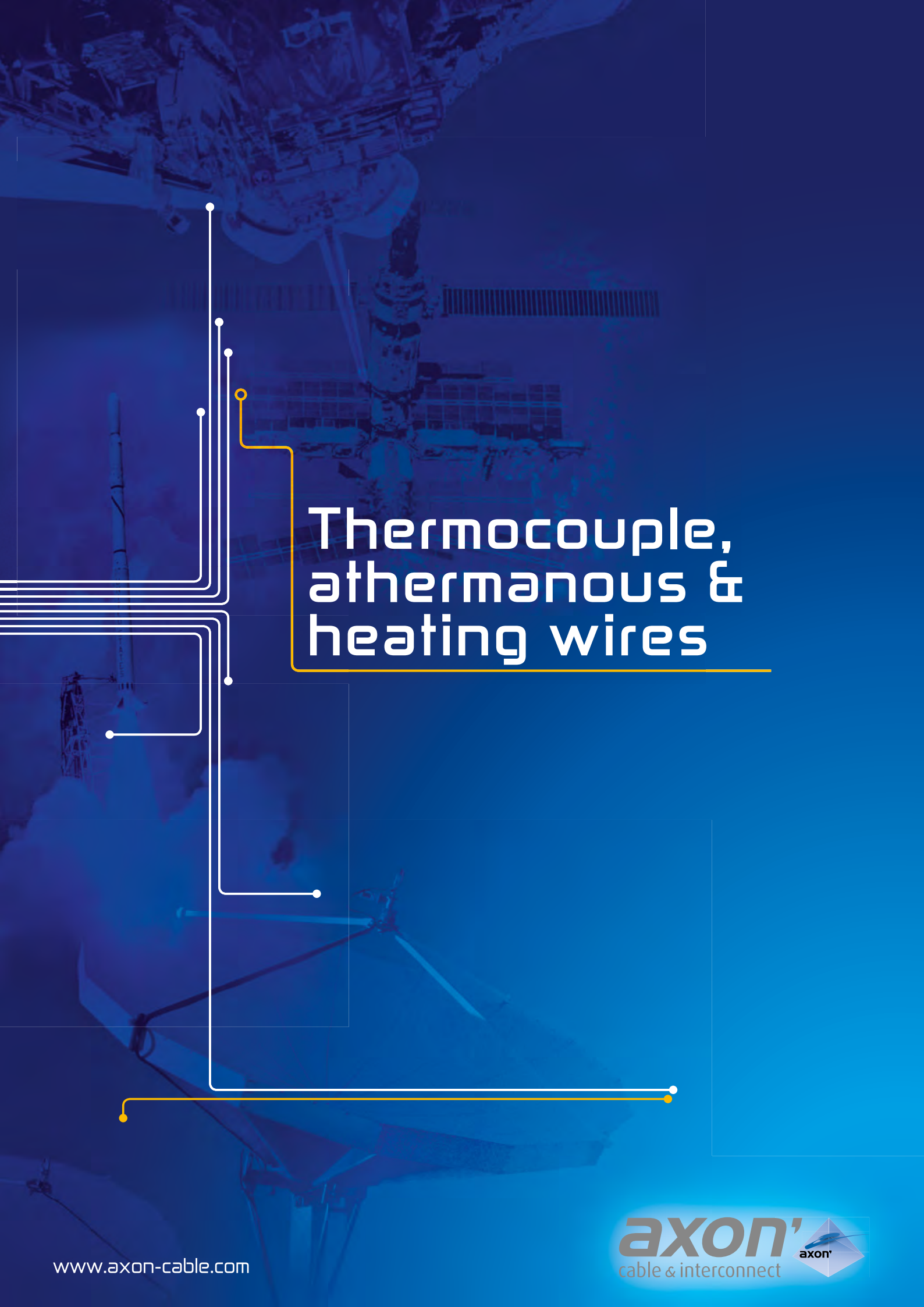
QUASI-FLEX® IS HAND-FORMABLE

Electromagnetic compatibility

The copper tube used for the shielding of semi-rigid cables ensures excellent shield efficiency properties. In order to replace these products, QUASI-FLEX® cables have to offer similar advantages. Tests have been carried out in a mode stirred chamber according to MIL-STD-1344. These tests show that the objectives have been achieved with results close to the limit of the test device sensitivity.



MEASUREMENTS IN AXON'S MODE STIRRED CHAMBER



Thermocouple, athermanous & heating wires

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axon' cable & interconnect

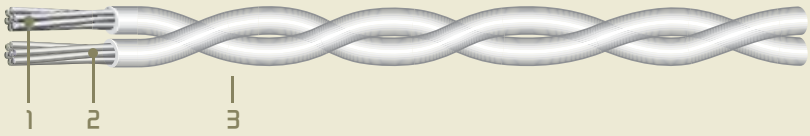
THERMOCOUPLE EXTENSION CABLES

AXON' offers thermocouple extension cables to test the thermal behaviour of satellites in a vacuum chamber.

AXON' thermocouple extension cables have the following properties:
- Made with cost effective but vacuum compatible materials including bare copper, constantan® and FEP. These thermocouple extension cables can be left inside the satellite for flight.
- Accurate and reliable: AXON' thermocouple extension cables are delivered with a calibration certificate made by qualified laboratories.
- Compatible with dedicated contacts and connectors (please contact us).

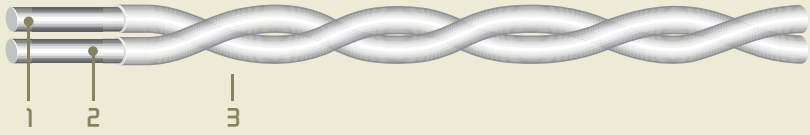
Examples of construction

Thermocouple extension cable 2xKT2407



1 - 2407 AWG Bare copper conductor,
2 - 2407 AWG Constantan® (T-type) conductor (-200°C to 350°C)*,
3 - FEP insulation (colours upon request).
Wire operating temperature: -90°C / +200°C.

Thermocouple extension cable 2xKT2801



1 - 2801 AWG Bare copper conductor,
2 - 2801 AWG Constantan® (T-type) conductor (-200°C to 350°C)*,
3 - FEP insulation (colours upon request).
Wire operating temperature: -90°C / +200°C.

24, 26 and 30 AWG also available.
For applications requiring very high temperatures, such as a rocket motor, other conductor materials* can be offered:
- J-type: Iron / Constantan® (-40°C to +750°C),
- E-type: Chromel® / Constantan® (-200°C to +900°C),
- N-type: Nicrosil® / Nisil® (-200°C to +1200°C).

*: Temperature range of the thermocouple conductors. Wire operation temperature will depend on the insulation material used. Don't hesitate to contact us for special queries.

THERMOCOUPLE EXTENSION CABLE (COPPER / CONSTANTAN®)

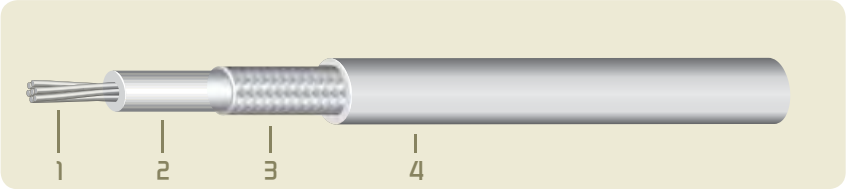
Athermanous and heating wires

Both AXON' athermanous and heating wires have the following properties:
- Can be made with any ESCC contruction available in our *ESA Wires & Cables* chapter. Custom constructions available on request.
- Compatible with dedicated contacts and connectors (please contact us).

AXON' offers cables & wires with special thermal properties to either facilitate or reduce the transmission of heat.

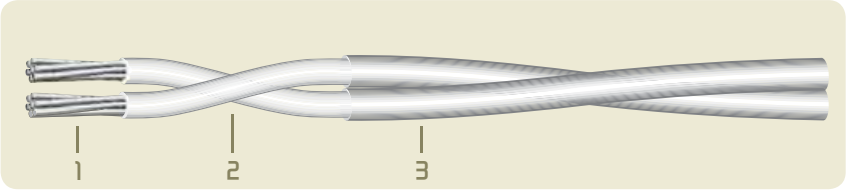
Examples of construction

Shielded jacketed single stainless steel wire



1 - Stranded stainless steel conductor,
2 - PTFE insulation,
3 - Stainless steel,
4 - PFA insulation.

Twisted pair



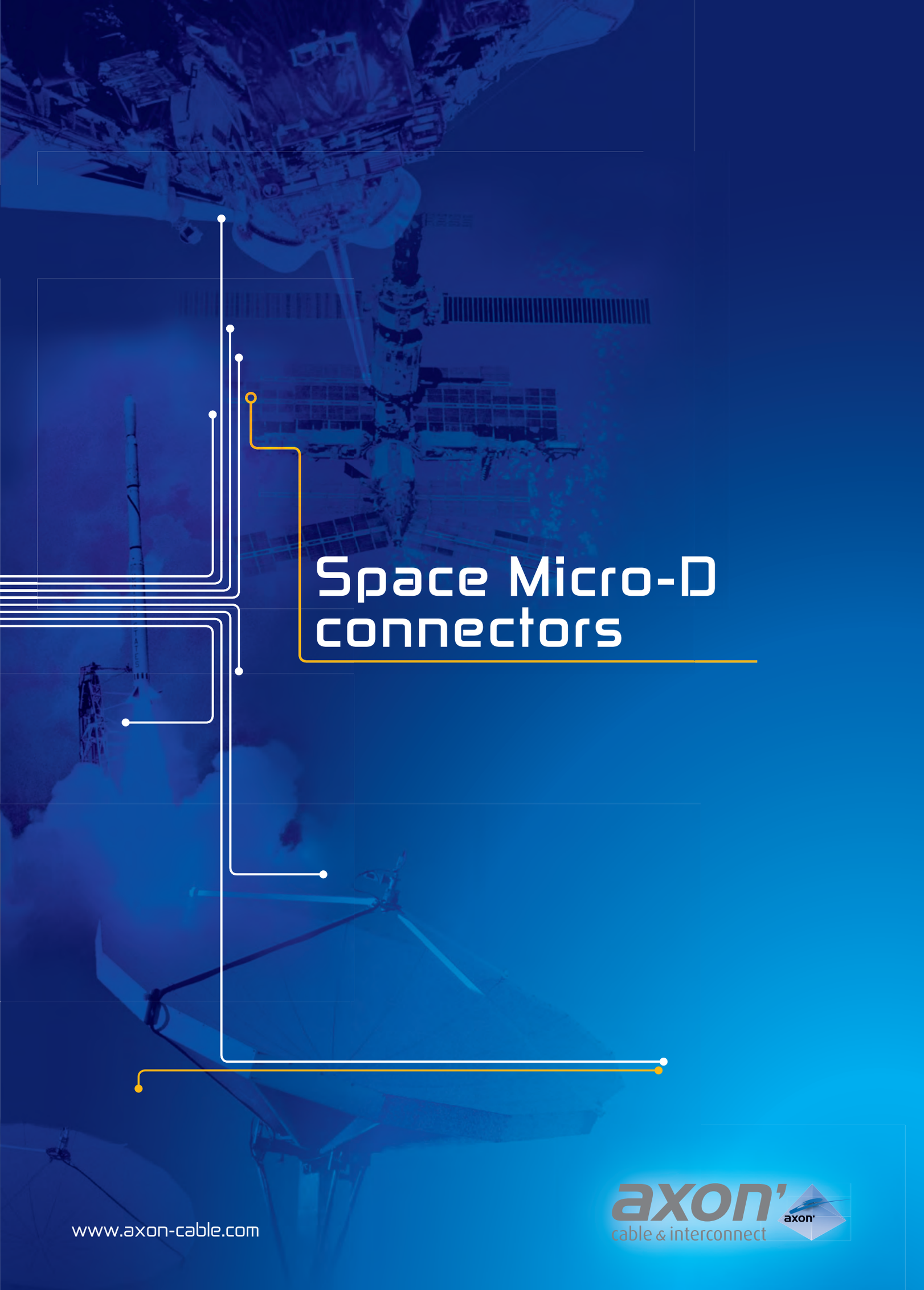
1 - Stranded brass conductor,
2 - Extruded PTFE insulation,
3 - Polyimide protective coating.

Designed to cover a range of thermal conductivity and linear resistance requirements, AXON' uses the following conductor types:

	Copper	Brass	Stainless steel 316L*	Kanthal
Thermal conductivity (W/mK)	400	150	15	11 (@ 50°C)
Linear resistance (Ω.m)	$1.724\ 10^{-8}$	$6.3\ 10^{-8}$	$76\ 10^{-8}$	$145\ 10^{-8}$

*Other grades of stainless steel are available

ATHERMANOUS TWISTED PAIR WIRES



Space Micro-D connectors

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axon' cable & interconnect

Space Micro-D connectors

Micro-D connectors

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Space applications

ESA WIRES AND CABLES

ACCESSORIES

AXON' HAS MORE THAN 5,000 FT² (460 M²) OF CLEANROOM AREA DEDICATED TO SPACE APPLICATIONS

AXON' has been involved in numerous space approved projects such as:

› MIL-STD-1553 databus systems

› ESCC wires and cables
- ESCC 3901 001: Polyimide insulated wires.
- ESCC 3901 002: Lightweight polyimide insulated wires.
- ESCC 3901 012: Radiation cross-linked ETFE insulated cables.
- ESCC 3901 013: PTFE / polyimide insulated wires and cables.
- ESCC 3901 018: PTFE / polyimide insulated wires and cables.
- ESCC 3901 019: CELLOFLON® / polyimide insulated wires.
- ESCC 3901 021: PTFE / polyimide insulated wires and cables.
- ESCC 3901 024: Abrasion resistant PTFE tape wires and cables.
- ESCC 3902 002: Coaxial, triaxial and symmetrical cables.

› High Speed data links (IEEE 1394, SpaceWire)
- ESCC 3902/003 SpaceWire cable manufacturing.
- ECSS-E-50-12C SpaceWire cabling.

› Very High Speed data links up to 10Gb/s on dedicated 100Ω media low skew & low crosstalk with matched Micro-D connectors.
› Power distribution systems: aluminium busbars for reduced weight and improved voltage drop.
› MIL-STD-1553 connectors (ACB1) approved to ESCC3401 079.
› Various accessories available including halorings, backshells, and special hardware.
› Custom designed cables and assemblies with specific properties, such as temperature control, low electrostatic output and radiation resistance.

AXON' has been involved in numerous space approved projects such as:
› the International Space Station for manned flights.
› various satellites programmes (LEO and GEO).
› rocket launchers such as Ariane 5.

› Approval:
ESCC 3401/029 (ESA EPPL2)

MDSA range

Micro-D connectors and assemblies for space applications

AXON' has drawn upon long experience in the highly challenging environment of space electronics to develop Micro-D connectors and assemblies suitable for this demanding area. Marrying the Micro-D design with the need to be able to reliably transmit signals, power and high speed data, AXON' has developed custom solutions for a wide variety of applications in space.

AXON' space products are assembled to the highest standards, meeting the ECSS-Q-ST-70-08 and ECSS-Q-ST-70-26 requirements, and all such products are built in one of our humidity controlled, class 100,000 clean rooms.

AXON' has been approved to ESCC 3401/029 EPPL2 since 2006.

General characteristics

Electrical & mechanical characteristics

CHARACTERISTICS	SPECIFICATION	TEST METHOD
CURRENT RATING (derating according to ESCC 3401 / 029)	2.5 A max for AWG26 & uninsulated wires 1.5 A max for AWG28 wires	
CONTACT RESISTANCE	5 mΩ @ current rating 6 mΩ @ low level current	Para 9.1.1.3 of ESCC 3401
INSULATION RESISTANCE	5000 MΩ min @ 500 V_{DC}	Para 9.1.1.1 of ESCC 3401
DIELECTRIC WITHSTANDING VOLTAGE	600 V_{RMS} / 2 mA (leakage current)	Para 9.1.1.2 of ESCC 3401
WORKING VOLTAGE - Sea level 0m - Altitude 33km (70.000 FT)	 150 V_{RMS} 100 V_{RMS}	Para 9.13.5 of ESCC 3401
CONTACT ENGAGING & SEPARATION FORCE	1.667 N max 0.137 N min	Para 4.3.9 of ESCC 3401/029
CONNECTOR MATING & DE-MATING FORCE	Mating: 20N (9 ways) to 113N (100 ways) max Demating: 20N max / 1.3N min (9 ways) to 113N max / 7.1N min (100 ways)	Para 9.20 of ESCC 3401
CONTACT RETENTION	22.25 N for female contacts	Para 9.17 of ESCC 3401
DURABILITY	500 mating cycles min.	Para 9.18 of ESCC 3401
TEMPERATURE RANGE	-55°C / +125°C	
VIBRATION	20g's - no discontinuity > 1µs	Para 9.11 of ESCC 3401
SHOCK	50g's - no discontinuity > 1µs	Para 9.12 of ESCC 3401
SALT SPRAY	48 Hours	Para 9.22 of ESCC 3401

Materials & finish

COMPONENT	MATERIAL	FINISH
MALE CONTACT (TWIST PIN)	COPPER AND BERYLLIUM COPPER	GOLD PLATING IN ACCORDANCE WITH ASTM-B488, TYPE II, CLASS 1 (1.27µM (0.050") MIN), CODE C OVER NICKEL UNDERPLATE IN ACCORDANCE WITH SAE-AMS-QQ-N-290 ALLOY CLASS 2 (1.27µM (0.050") TO 3.81µM (0.150"))
FEMALE CONTACT	COPPER ALLOY	
METAL SHELL	ALUMINIUM ALLOY, TYPE 6061 IN ACCORDANCE WITH SAE-AMS-QQ-A-250/11	HIGH-PHOSPHOROUS ELECTROLESS NICKEL PLATING – 25.4 µm MIN. 25.4µm GOLD PLATING OVER NICKEL UNDERPLATING
PLASTIC INSERT / PCB TRAY	LIQUID CRYSTAL POLYMER, 30% LOADED GLASS FIBRE POLYESTER, 94VO, IN ACCORDANCE WITH MIL-M-24519 (200°C)	
INTERFACIAL SEAL	FLUOROSILICONE RUBBER IN ACCORDANCE WITH A-A-59588	
HARDWARE	STAINLESS STEEL, 300 SERIES	PASSIVATION IN ACCORDANCE WITH SAE-AMS2700
ENCAPSULANT	SPACE GRADE EPOXY RESIN	
INSULATED WIRE	- POLYIMIDE INSULATED WIRES IN ACCORDANCE WITH ESCC 3901/002 - PTFE INSULATED WIRES IN ACCORDANCE WITH ESCC 3901/013 - ETFE INSULATED SILVER PLATED COPPER IN ACCORDANCE WITH SAE-AS22759/33	
UNINSULATED WIRE	SOLID COPPER WIRES IN ACCORDANCE WITH QQ-W-343 TYPE 'S' GOLD PLATED ACCORDING TO MIL-G-45204, CLASS 2 GRADE C OR D	

Pigtail connectors

METAL SHELL

- Nickel or gold plated shells for space applications.
- Supplied pre-wired and fully potted.

For more information (e.g. dimensions, panel mounting guide) please refer to our Micro-D catalogue.

IDENTIFICATION CODE

MDSA 2 15 P E F 46 M

SERIES
MDSA: Micro-D Space AXON' connectors

PLATING
2: Nickel plated
5: Gold plated

NUMBER OF CONTACTS
9, 15, 21, 25, 31, 37, 51

GENDER
P: Male crimped contacts
S: Female crimped contacts

WIRE TYPE
V01301: Single wire ESCC 3901 013 - Variant01 (AWG28)
V01302: Single wire ESCC 3901 013 - Variant02 (AWG26)
V00261: Single wire ESCC 3901 002 - Variant61 (AWG28)
V00256: Single wire ESCC 3901 002 - Variant56 (AWG26)
G: Uninsulated ESCC wires AWG2501 gold plated
E: Single wire M22759/33-26 (recommended for space application by MIL-DTL-83513)
NB: Other wires upon request

WIRE COLOUR
ESCC wires only: **BLANK** (see wire descriptions and wire colours page D-9)
Uninsulated wires only: **BLANK** (see wire descriptions and wire colours page D-9)
Insulated wires:
F: Yellow (for wire code E only)
L: White (for wire code E only)
W: 10 colours code per MIL-STD-681, as required by MIL-DLT-83513 (for wire code E only)

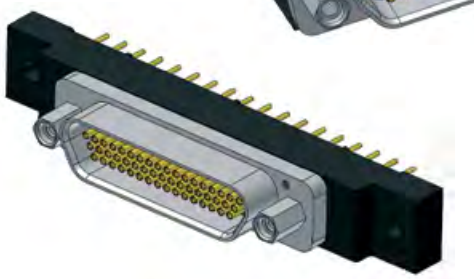
WIRE LENGTH
XXX = length in cm

L in cm (inches)	L ≤ 10 (L ≤ 3.940)	10 < L ≤ 100 (3.940 < L ≤ 39.40)	L > 100 (L > 39.40)
TOLERANCE in cm (inches)	-0 / +0.5 (-0 / +0.200)	-0 / +3 (-0 / +1.180)	-0 / +5 (-0 / +1.970)

HARDWARE
B: Fixed mounting holes (no hardware)
M: Low profile Allen head jackscrews (removable)
N: High profile Allen head jackscrews (removable)
S: Low profile slot head jackscrews (removable)
T: High profile slot head jackscrews (removable)
P: Jackpost
K: High profile slot head jackscrews (non-removable)
L: Low profile Allen head jackscrews (non-removable)
F: Floating mount (non-removable)

LAT Level to be indicated when ordering - see page D-10

PCB connectors



METAL SHELL

- Nickel or gold plated shells for space applications.
- Board right angle or straight to accomodate all configurations.
- To be used with flexible and rigid printed circuit boards.
- Several tail lengths available.

For more information (e.g. dimensions, panel mounting guide) please refer to our Micro-D catalogue.

IDENTIFICATION CODE MDSA 2 25 P CBR P G 1

SERIES
MDSA: Micro-D Space AXON' connectors

PLATING
2: Nickel plated
5: Gold plated

NUMBER OF CONTACTS
9, 15, 21, 25, 31, 37, 51

GENDER
P: Male crimped contacts
S: Female crimped contacts

TERMINATION TYPE
BS: Board Straight version
BR: Board Right Angle version
CBR: Condensed Board Right Angle version

HARDWARE
B: No jackpost or threaded PCB mounting holes
P: Jackpost installed, no threaded PCB mounting holes
T: Threaded PCB mounting holes only
W: Jackpost installed and threaded PCB mounting holes

CONDUCTOR TYPE
G: Uninsulated ESCC wires AWG2501 gold plated

TAIL LENGTH
1: 2.80 mm - 0.109"
2: 3.80 mm - 0.150"
3: 4.80 mm - 0.190"
4: 6.35 mm - 0.250"

Tolerance: ± 0.38 mm (0.015")
NB: Other wires upon request

LAT Level to be indicated when ordering - see page D-10

Wire descriptions

Insulated wire AWG28, in accordance with ESCC 3901/013 Variant 01 (V01301)

Conductor	Max Ø: 0.42 mm
	Nominal cross-section: 0.089 mm²
Insulation	Max Ø: 0.82 mm
	Max weight: 1.8 g/m
	Colour: Natural

Insulated wire AWG26, in accordance with ESCC 3901/013 Variant 02 (V01302)

Conductor	Max Ø: 0.50 mm
	Nominal cross-section: 0.14 mm²
Insulation	Max Ø: 0.89 mm
	Max weight: 2.3 g/m
	Colour: Natural

Insulated wire AWG28, in accordance with ESCC 3901/002 Variant 61 (V00261)

Conductor	Max Ø: 0.43 mm
	Nominal cross-section: 0.10 mm²
Insulation	Max Ø: 0.68 mm
	Max weight: 1.23 g/m
	Colour: Brown

Insulated wire AWG26, in accordance with ESCC 3901/002 Variant 56 (V00256)

Conductor	Max Ø: 0.53 mm
	Nominal cross-section: 0.15 mm²
Insulation	Max Ø: 0.78 mm
	Max weight: 1.93 g/m
	Colour: Black

Uninsulated solid wire AWG2501, in accordance with QQ-W-343 type "S" (G)

Gold plated per MIL-G-45204, Class 2 grade C or D
Conductor Ø: 0.455 ± 0.005 mm
Min gold plating thickness: 0.5 µm
Max weight: 1.6 g/m

Insulated wire M22759/33-26 (E)

Conductor	Nom Ø: 0.483 mm
	Nominal cross-section: 0.154 mm²
Insulation	Nom Ø: 0.81 mm
	Max weight: 2.1 g/m

LAT Levels

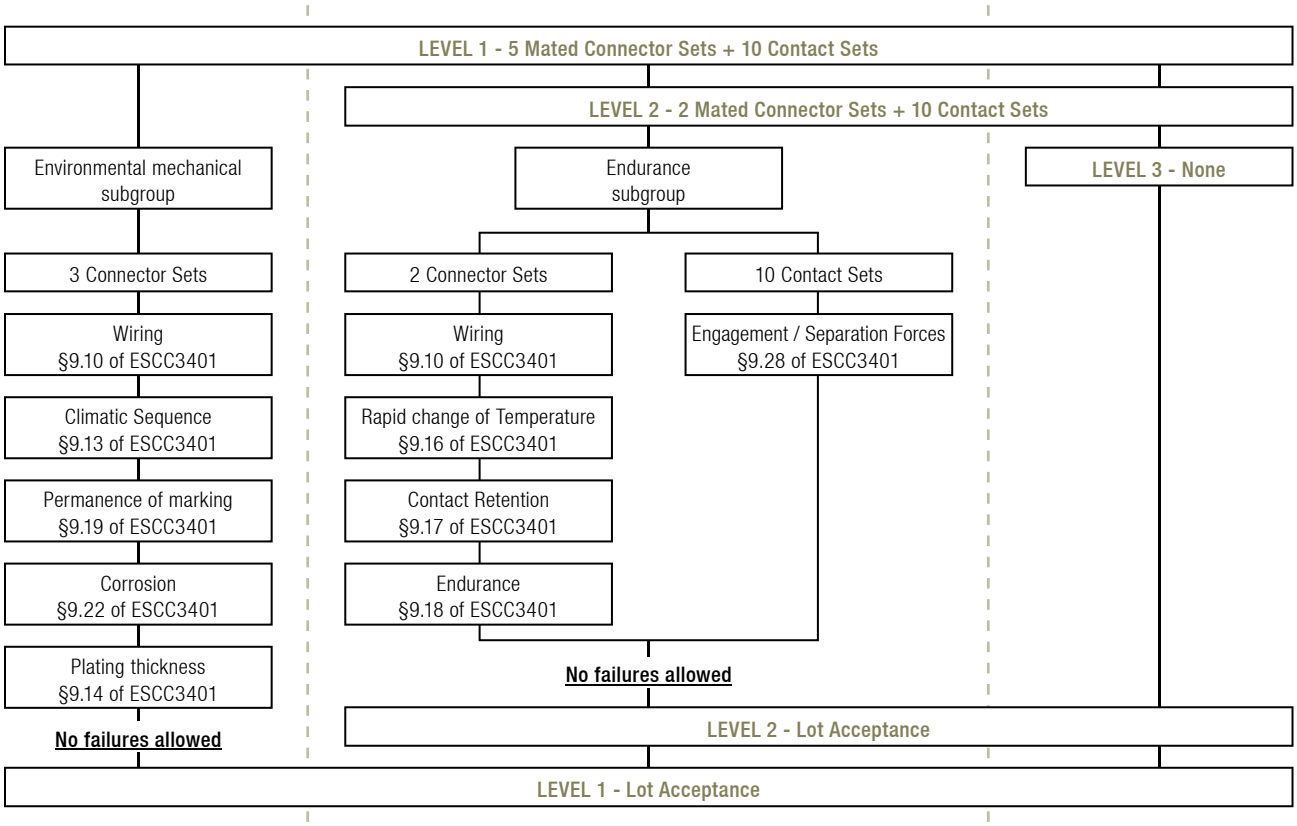
The required level of Lot Acceptance Testing is to be specified when ordering.
The sample size of the three Lot Acceptance Tests are shown in the diagram below.
All components assigned to a subgroup shall be subjected to all the tests of that subgroup in the table test sequence.

Lot Acceptance “level 3”:
No tests or inspections are required for this level.

Lot Acceptance “level 2”:
This level includes the electrical and endurance subgroup.

Lot Acceptance “level 1”:
This level includes everything in level 2 plus environmental and mechanical subgroups.

SAMPLE SIZES ACCORDING TO REQUIRED LAT LEVEL



120 Way Micro-D connectors

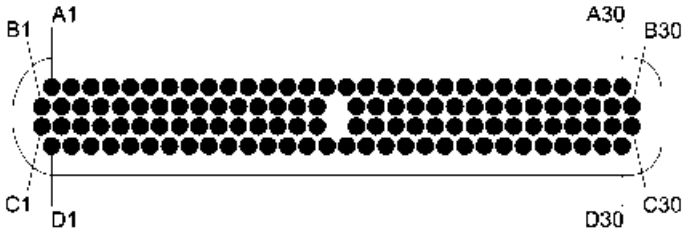
120 WAY MICRO-D CARD EDGE CONNECTOR

An enduring trend in the electronics industry is the continuing drive towards miniaturisation. This leads in turn to ever greater cabling densities with an ever larger number of signals required within limited space constraints. In answer to these challenges, AXON' CABLE has developed a range of 120 way Micro-D connectors. They are available as pigtails or within assemblies but can equally be supplied as PCB connectors in either surface mount or through hole format. Connector savers are part of the range.

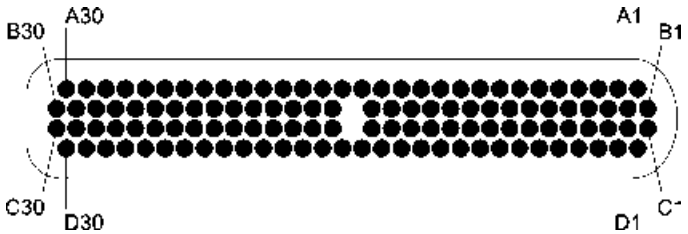
These connectors have been developed and tested for the challenging requirements of space electronics, and can be used for any applications where severe environmental conditions and high density cabling are critical. Keying hardware is an option.

AXON' can offer specific numbers of contacts for custom designed applications. Specific designs are not contained within the MIL specification but AXON's solutions remain fully compatible with the MIL-DTL-83513 standard as far as performance and construction are concerned.

Contact arrangements



MATING FACE OF THE 120 WAY MALE CONNECTOR



MATING FACE OF THE 120 WAY FEMALE CONNECTOR

1.27 mm (.050") contact spacing.
1.27 mm (.050") spacing between two rows.

References

DESCRIPTION	REFERENCE	COMMENTS	PAGE
120 WAY PLUG CONNECTOR FOR CABLE OR ASSEMBLY	MDA 2 120 P 000 J	Wire, length and colour type to be defined	D-14
120 WAY SOCKET CONNECTOR FOR CABLE OR ASSEMBLY	MDA 2 120 S 000 H	Wire, length and colour type to be defined	D-14
120 WAY SOCKET SMT	MDA 2 120 S SMT H	Can only be mated with pigtail plug	D-15
120 WAY SMT PLUG (TO MATE WITH SMT SOCKET ONLY)	MDA 2 120 P SMTX J	Can only be mated with SMT socket	D-16
120 WAY SMT SOCKET (TO MATE WITH SMT PLUG ONLY)	MDA 2 120 S SMTX H	Can only be mated with SMT plug	D-16
120 WAY SOCKET PANEL MOUNT SMT	MDA 2 120 S PSMT H		D-17
120 WAY SOCKET PANEL MOUNT PIGTAIL	MDA 2 120 S P000 H	Wire, length and colour type to be defined	D-17
120 WAY BS PLUG	MDA 2 120 P BS J		D-18
120 WAY CONNECTOR SAVER	MDA 2 120 CS 1 HJ		D-18

Keying hardware

SPECIAL 120 WAY MALE HARDWARE KIT WITH KEYWAY: J	SPECIAL 120 WAY FEMALE HARDWARE KIT WITH KEYWAY: H
	

Electrical & mechanical characteristics

CHARACTERISTICS	SPECIFICATIONS	TEST METHODS
CURRENT RATING	2.5 A max. 1.5 A max. for SMT & PCB connectors	EIA-364-70
CONTACT RESISTANCE	8 mΩ max.	EIA-364-06
INSULATION RESISTANCE	5000 MΩ min. @ 500 VDC	EIA-364-21
DIELECTRIC WITHSTANDING VOLTAGE - Sea level 0 m - Altitude 33 km (70.000 FT) SMT connectors	600 VAC 150 VAC 250 VAC	EIA-364-20
CONTACT ENGAGING & SEPARATION FORCE	170 g max. (6 oz) 14 g min. (0.5 oz)	EIA-364-37
CONNECTOR MATING & DE-MATING FORCES	283 g (10 oz) X Number of contact max.	EIA-364-13
CONTACT RETENTION	2.26 kg (5 lbs) for 5 seconds min.	EIA-364-29
DURABILITY	500 mating cycles min.	EIA-364-09
TEMPERATURE RANGE	-55°C / +125°C	
VIBRATION	20 g's - no discontinuity > 1 µs	EIA-364-28 TEST CONDITION IV
SHOCK	50 g's - no discontinuity > 1 µs	EIA-364-27 TEST CONDITION E
SALT SPRAY	48 hours	EIA-364-26 TEST CONDITION B
HUMIDITY	Insulation resistance > 1 MΩ	EIA-364-31 TEST METHOD IV

Materials & finish

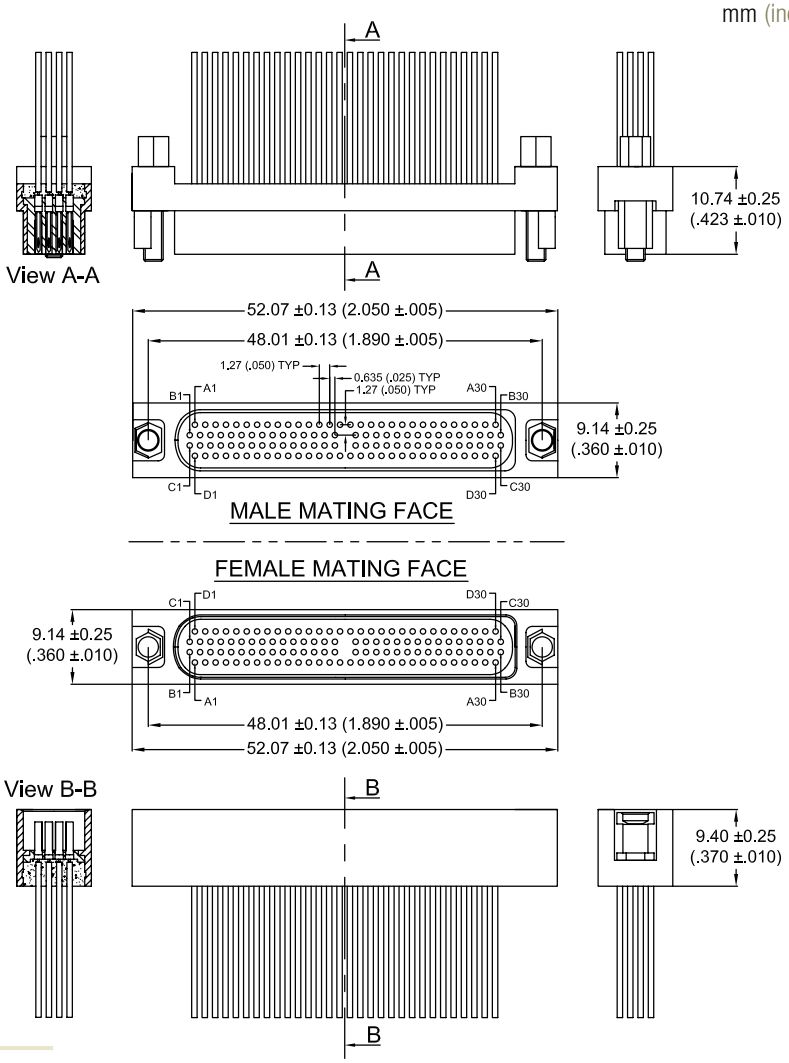
COMPONENTS	MATERIAL	FINISH
MALE CONTACT (TWIST PIN)	COPPER AND BERYLLIUM IN ACCORDANCE WITH ASTM-B-194	GOLD PLATING IN ACCORDANCE WITH ASTM-B488, TYPE II, CLASS 1 (1.27 µm MIN), CODE C, OVER NICKEL UNDERPLATE IN ACCORDANCE WITH SAE-AMS-QQ-N-290, CLASS 2 (1.27 µm TO 3.81 µm)
FEMALE CONTACT	COPPER ALLOY	
METAL SHELL	ALUMINIUM ALLOY, TYPE 6061 IN ACCORDANCE WITH SAE-AMS-QQ-A-250/11	ELECTROLESS NICKEL PLATING IN ACCORDANCE WITH SAE-AMS2404, CLASS 3 OR 4, .0005 INCH MIN.
INSERTS	LIQUID CRYSTAL POLYMER, 30% LOADED GLASS FIBRE POLYESTER, 94VO, IN ACCORDANCE WITH MIL-M-24519 (200°C)	
HARDWARE	STAINLESS STEEL, 300 SERIES	PASSIVATION IN ACCORDANCE WITH SAE-AMS2700
ENCAPSULANT	EPOXY RESIN	
UNINSULATED WIRE	AWG 2801 SOLID COPPER WIRE	GOLD PLATED IN ACCORDANCE WITH A-A-59551

120 way male and female connectors for cables and harnesses

Both male and female connectors can be assembled with various wire sizes in shielded and unshielded forms. High speed variants can also be produced, using controlled impedance shielded twisted pairs which allow data rates of up to 880 Mbps. For space applications, these connectors are assembled in a class 100.000 clean room, and can be terminated with ESA ESCC (European Space Agency) approved wires.

MDA 2 120 P 000 J
MDA 2 120 S 000 H

mm (inch)



Surface Mount PCB card edge connectors

Surface Mount (SMT) connectors have two rows of 28 AWG gold plated leads at 0.635 mm (.025") pitch spacing to terminate to PCB's by soldering. Lugs on either side of the connector allow for mechanical clamping onto the PCB.

Available versions

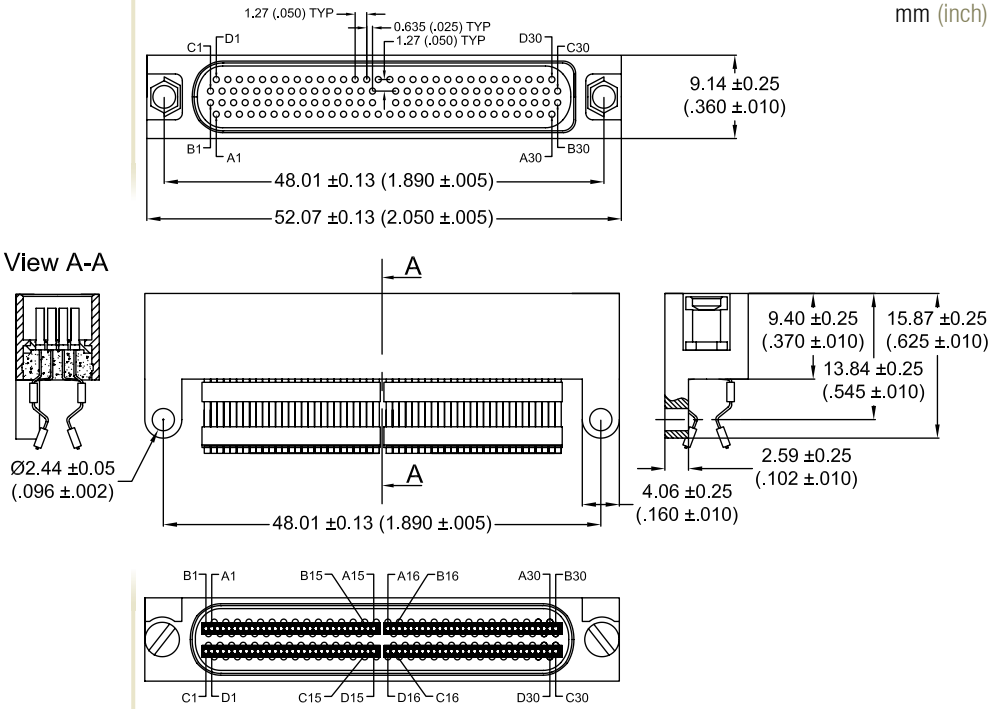
- Female style to mate a male pigtail or assembly connector.
- Male and female styles to mate together (this option has a longer shell to retain the keying hardware system).
- Female style for panel mount.

Female SMT

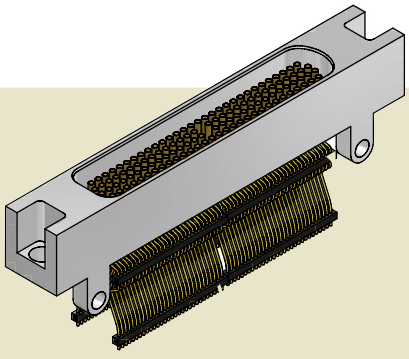
to mate a male cable connector.

MDA 2 120 S SMT H

mm (inch)



SEE CONTACT LAYOUT ON PCB PAGE D-19



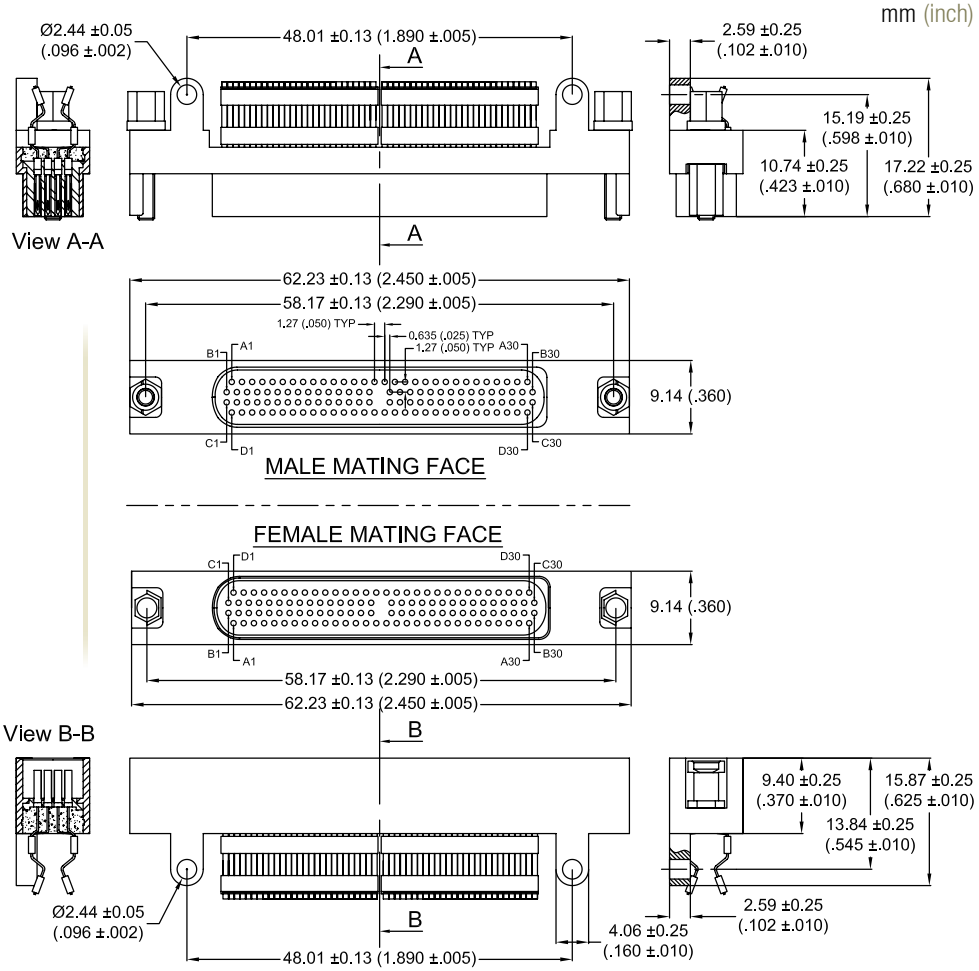
FEMALE SMT CONNECTOR

Male & female SMT connectors

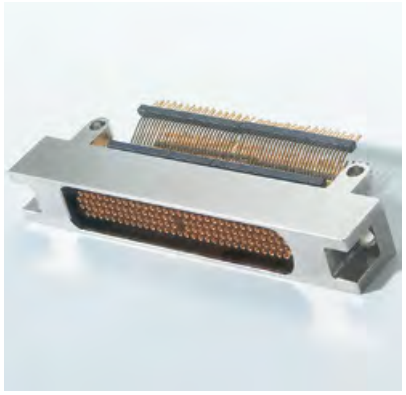
mating exclusively with each other

MDA 2 120 P SMTX J
MDA 2 120 S SMTX H

mm (inch)



SEE CONTACT LAYOUT ON PCB PAGE D-19

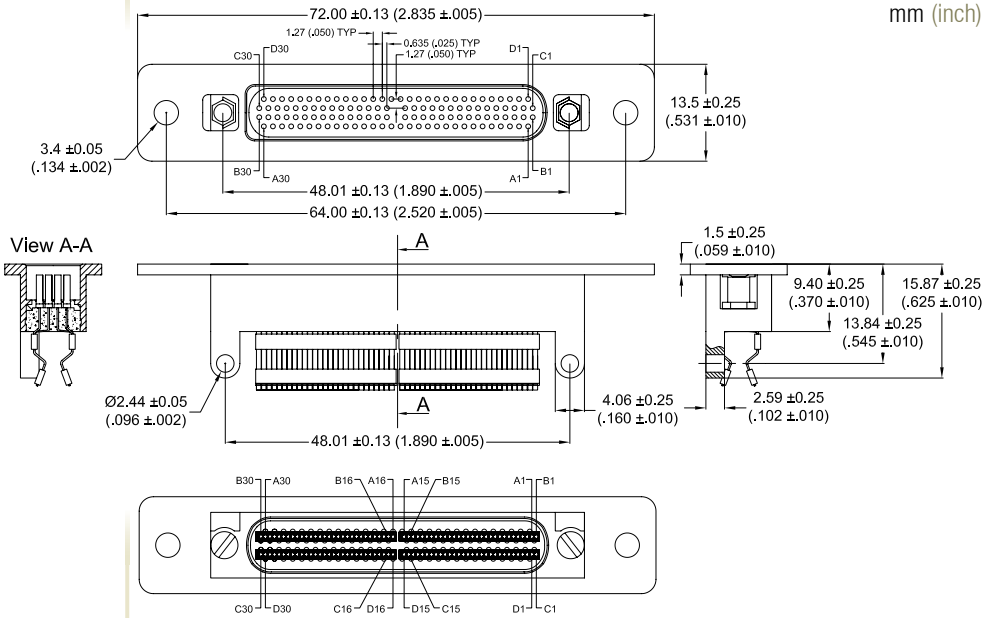


FEMALE SMT CONNECTOR

Female SMT connector for panel mount

MDA 2 120 S PSMT H

mm (inch)

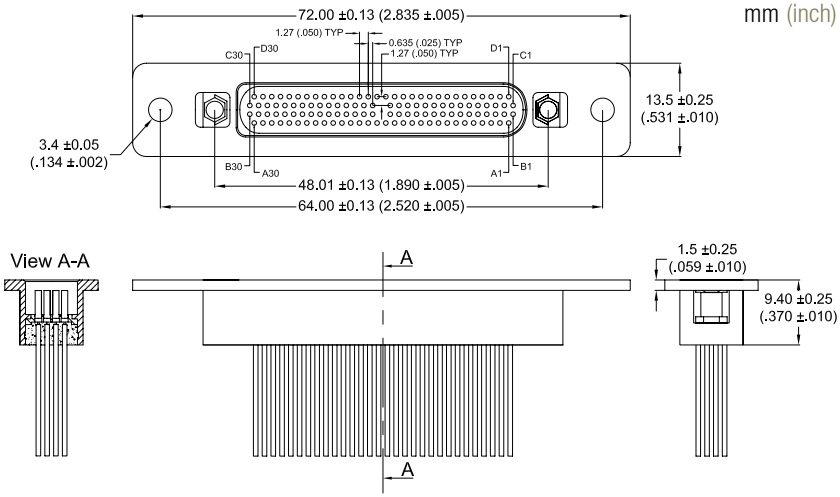


SEE CONTACT LAYOUT ON PCB PAGE D-19

Female panel mount connector for cable and assembly

MDA 2 120 S P000 H

mm (inch)

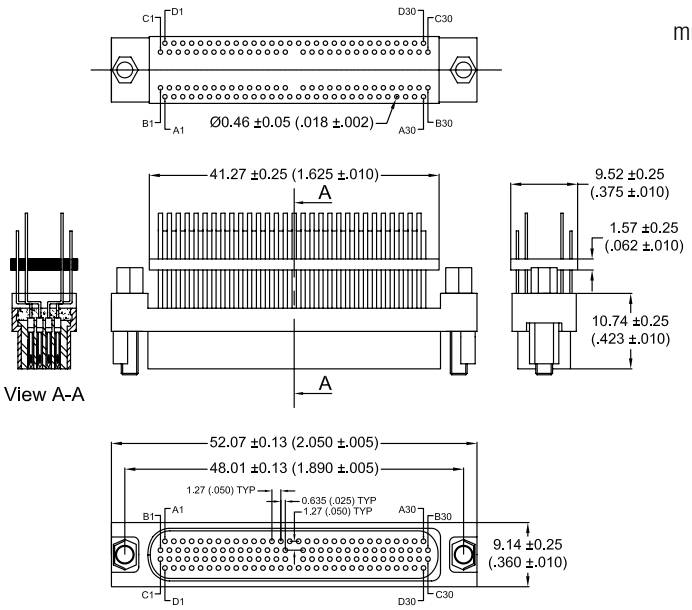


BS connector

The BS version is similar to straight PCB connector style of the MIL standard. Available in male version only.

MDA 2 120 P BS J

mm (inch)



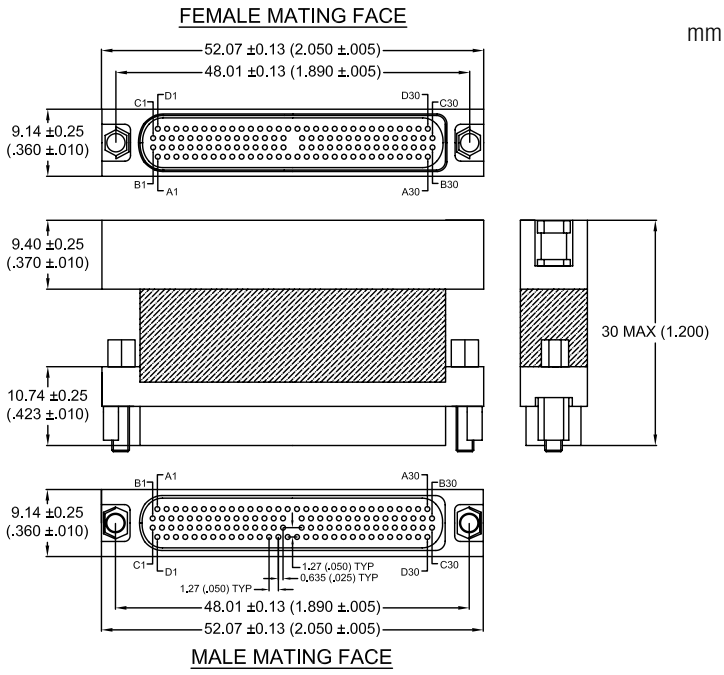
SEE CONTACT LAYOUT ON PCB PAGE D-20

Connector saver

Connector savers have been developed to protect expensive equipment. Typical applications include test equipment and space-grade instruments.

MDA 2 120 CS 1 HJ

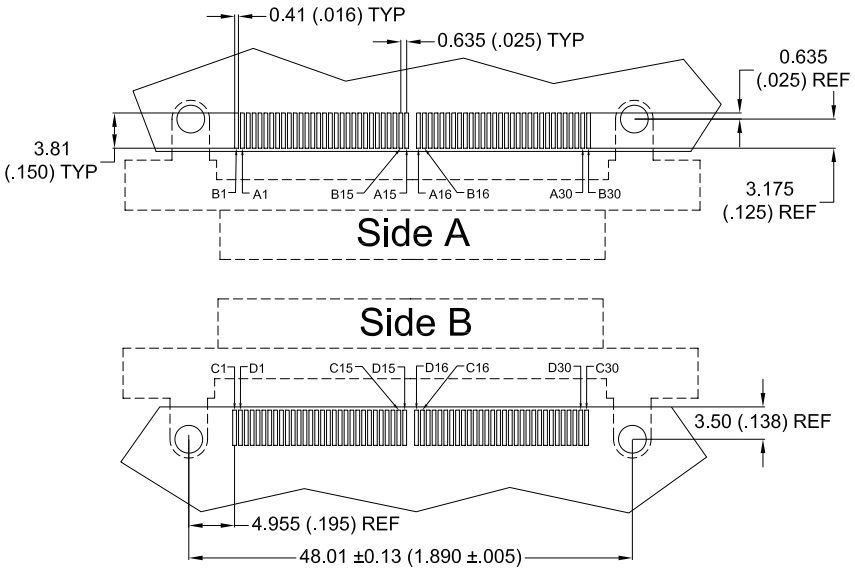
mm (inch)



PCB layout

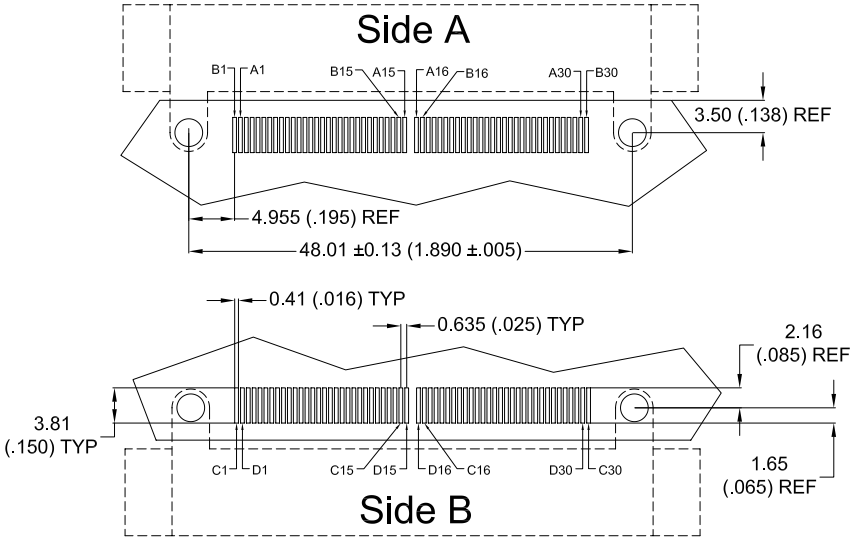
Male SMT (surface mount style) connector

mm (inch)



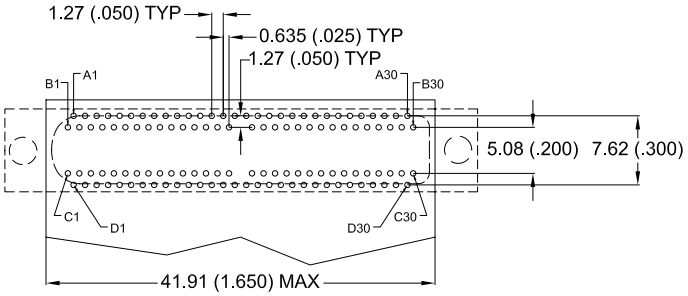
Female SMT (surface mount style) connector

mm (inch)

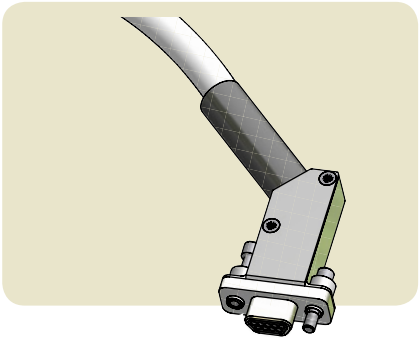


BS version (male only)

mm (inch)

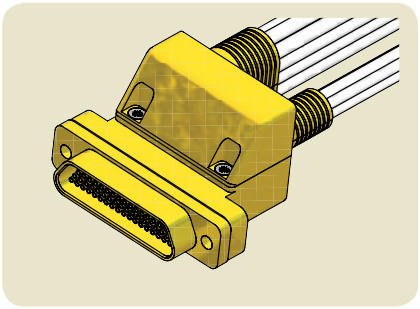


Custom space applications



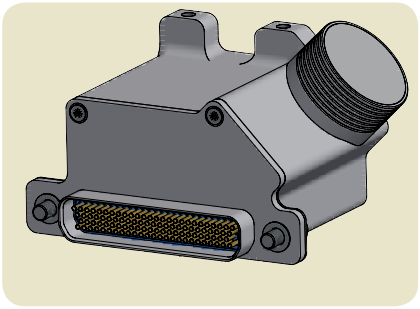
SpaceWire or IEEE 1394 with custom backshell

45° Entry for the backshell.
This addition to the High speed family features a new backshell entry. This design is used when space is limited behind the connector.



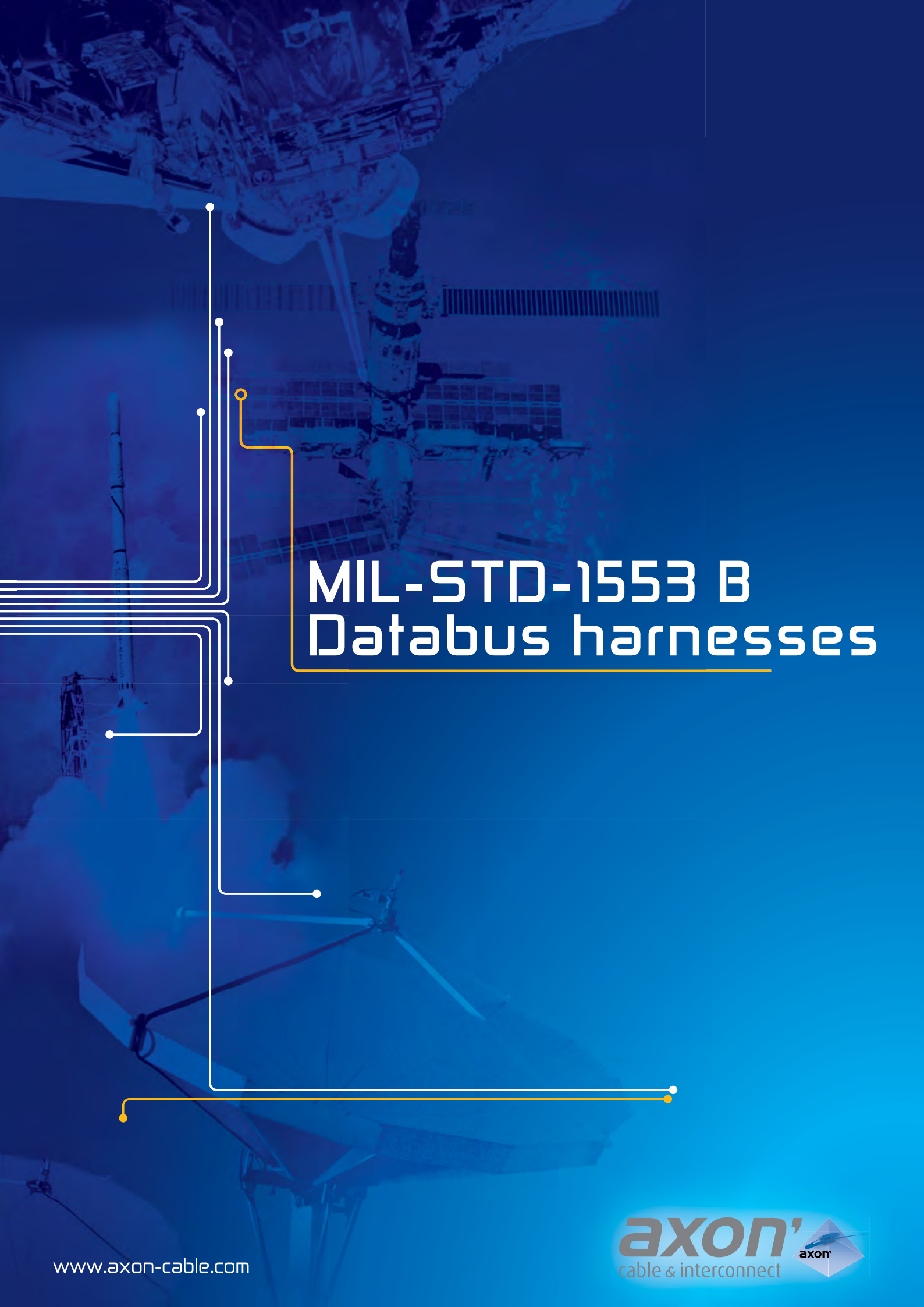
Space Micro-D with custom backshell

Two different funnel entries, making it possible to separate two different cable bundles. This request features two different bundle routings.



Multi-LVDS pairs with custom backshell

This custom backshell has two lugs with threads in order to improve the stability and the fixation of this connector, causing less stress on the contacts.



MIL-STD-1553 B Databus harnesses

www.axon-cable.com

axon' cable & interconnect

DATABUS

DATABUS

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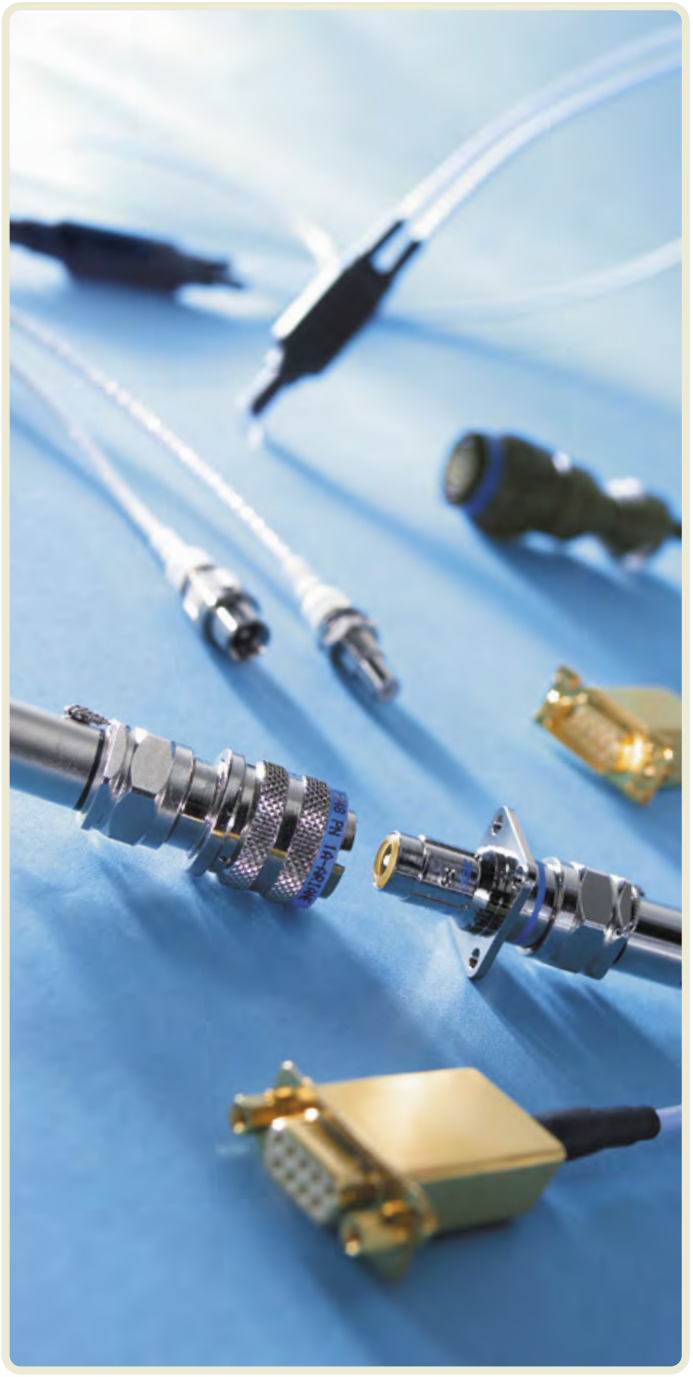


MIL-STD-1553 B databus harnesses

AXON' DATABUS HARNESSES AND COMPONENTS

Axon' Cable designs and manufactures all components used in data transmission systems in compliance with the **MIL-STD-1553 standard**. This is the protocol of dialogue for strategic **on-board** systems for aeronautics, space and military applications. These reliable transmission networks offer high security of data, signal integrity, weight and space saving, as well as rapid diagnostics of all equipment connected to the bus. Axon' has developed inline couplers, cables, terminators, splices and connectors made with space-grade materials and according to ESA manufacturing procedures (PID & French Space Agency CNES approvals).

The datasheets included in this brochure help you choose the very databus harnesses you need. The identification code (page "In-line coupler identification code", page E-4) gives you an overview of all our databus cables references including aeronautics (A) and space (S) versions.

Space databus cables

Databus cables for space applications (References: 40, 41, 43, 44 and 45) are 2219 AWG, 2419 AWG and 2619 AWG screened twisted-pair cables insulated with PTFE or PFA. They are designed to resist corrosion. The most common used are AWG2419 cables. Depending on the level of electromagnetic efficiency, single or double braid constructions are available.

Space couplers

Please consult our datasheets to choose the best solution for your routing: number of stubs, PCB routing, integrated terminators should be considered.

Databus connectors

Axon' has developed a triaxial connector called ACB1 suitable for any type of twisted shielded AWG 24 pair cables. This is the only connector approved to ESCC 3401/079 by ESA.

Terminators and splices

Axon' offers accessories including 77 or 3 Ω removable terminators and splices. Terminators with ESD protection are available.

MANUFACTURE OF HARNESSES IN ISO 8 CLEAN ROOM

MIL-STD-1553 HARNESS

In-line coupler identification code

AMB/ S - Cx - XX - XX ^ XX - XX

AXON' MICROBUS

AERONAUTICS VERSION A
EUROFIGHTER VERSION E
SPACE VERSION S

C1: 1 WAY IN-LINE COUPLER with bus lines on opposite sides of the coupler
C11: 1 WAY IN-LINE COUPLER with bus lines on same side of the coupler
C2: 2 WAY IN-LINE COUPLER with bus lines on opposite sides of the coupler
C21: 2 WAY IN-LINE COUPLER with bus lines on same side of the coupler
C3: 3 WAY IN-LINE COUPLER with bus lines on opposite sides of the coupler
C31: 3 WAY IN-LINE COUPLER with bus lines on same side of the coupler
C4: 4 WAY IN-LINE COUPLER with bus lines on opposite sides of the coupler
C41: 4 WAY IN-LINE COUPLER with bus lines on same side of the coupler

CABLE REFERENCES

(See cable construction pages E-6 & E-7)

10: TWINAX BUS 10 AWG 24 SB [single braid] according to MIL-C17/176-00002 A
20 = TWINAX BUS 20 AWG 24 SB [single braid] accord. to pr EN 3375-003 A
21 = TWINAX BUS 21 AWG 24 DB [double braid] accord. to pr EN 3375-004 A
22 = TWINAX BUS 22 AWG 24 HI [high immunity] accord. to pr EN 3375-005 A
31 = TWINAX BUS 31 AWG 24 DB [double braid] according to PAN6421 E
40 = TWINAX BUS 40 AWG 24 SB [single braid] according to SSQ 21655 Rev. E S
41 = TWINAX BUS 41 AWG 24 DB [double braid] S
43 = TWINAX BUS 43 AWG 26 SB [single braid] S
44 = TWINAX BUS 44 AWG 26 DB [double braid] S
45 = TWINAX BUS 45 AWG 22 SB [single braid] according to SSQ 21655 Rev. E S
60 = TWINAX BUS 60 AWG 24 SB [single braid] E A
61 = TWINAX BUS 61 AWG 24 DB [double braid] E A
70 = TWINAX BUS 70 AWG 26 SB [single braid] A
71 = TWINAX BUS 71 AWG 26 DB [double braid] according to ECS 0700 A
72 = TWINAX BUS 72 AWG 26 HI [high immunity] A
80 = TWINAX BUS 80 AWG 24 SB [single braid] acc. to ESCC 3902 002 20 [black] S

CABLE LENGTH

(in meters)

COLOUR OF THE BUS LINE

H = blue
L = white

COLOUR OF THE STUB LINE

H = blue
L = white
S = blue with black stripes if the bus is blue
or white with blue stripes if the bus is white
B = only for & mandatory for TWINAX BUS 80 AWG 24 SB

INTEGRATED TERMINATOR

TL = Terminator on left side of coupler
TR = Terminator on right side of coupler
TT = Terminator on both sides
Blank = No terminator

ATTENTION: please see the technical data sheets to verify the compatibility between the coupler version, cable type and cable colour. Verify also the existence of the coupler and the colour of the cable.

Terminator identification code

AMB/ S - I - XX - XX ^ X

AXON' MICROBUS

AERONAUTICS VERSION A
EUROFIGHTER VERSION E
SPACE VERSION S

IN-LINE BUS TERMINATOR

CABLE REFERENCES

(See cable specifications pages E-6 & E-7)

10: TWINAX BUS 10 AWG 24 SB [single braid] according to MIL-C17/176-00002 A
20 = TWINAX BUS 20 AWG 24 SB [single braid] accord. to pr EN 3375-003 A
21 = TWINAX BUS 21 AWG 24 DB [double braid] accord. to pr EN 3375-004 A
22 = TWINAX BUS 22 AWG 24 HI [high immunity] accord. to pr EN 3375-005 A
31 = TWINAX BUS 31 AWG 24 DB [double braid] according to PAN6421 E
40 = TWINAX BUS 40 AWG 24 SB [single braid] according to SSQ 21655 Rev. E S
41 = TWINAX BUS 41 AWG 24 DB [double braid] S
43 = TWINAX BUS 43 AWG 26 SB [single braid] S
44 = TWINAX BUS 44 AWG 26 DB [double braid] S
45 = TWINAX BUS 45 AWG 22 SB [single braid] according to SSQ 21655 Rev. E S
60 = TWINAX BUS 60 AWG 24 SB [single braid] E A
61 = TWINAX BUS 61 AWG 24 DB [double braid] E A
70 = TWINAX BUS 70 AWG 26 SB [single braid] A
71 = TWINAX BUS 71 AWG 26 DB [double braid] according to ECS 0700 A
72 = TWINAX BUS 72 AWG 26 HI [high immunity] A
80 = TWINAX BUS 80 AWG 24 SB [single braid] acc. to ESCC 3902 002 20 [black] S

CABLE LENGTH

(in meters)

COLOUR OF CABLE

H = blue
L = white
B = only for & mandatory for TWINAX BUS 80 AWG 24 SB

Databus cable

SPECIFICATIONS

MIL-STD-1553B
MIL-C-17/176-00002
pr EN 3375
PANAVIA 6421
ECS 0700
SSQ 21655

Operating temperature

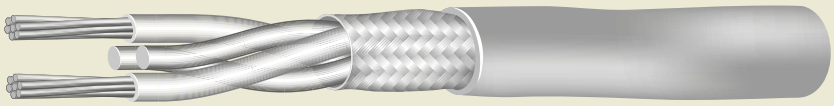
-55°C to +200°C, -65°C to +200°C, -65°C à +150°C, +200°C or -200°C to +180°C depending on applicable standards

Characteristic impedance

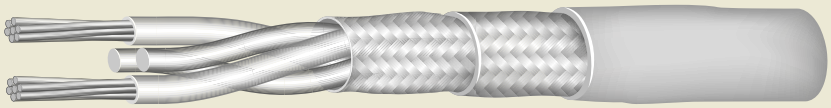
77 ±7 Ω at 1 MHz

Linear capacitance between wires see table on next page.

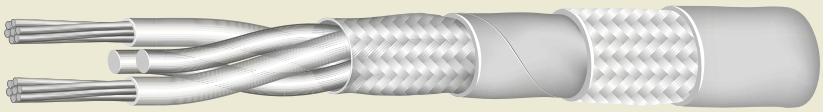
TYPE A (*)



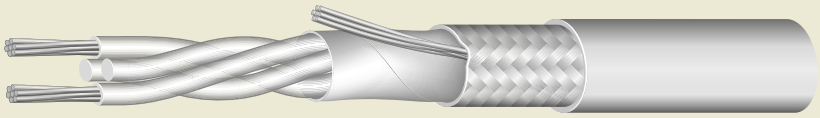
TYPE B (*)



TYPE C (*)



TYPE D (*)



(*) See cable type in the chart on the next page

Special cable versions

- Supplementary jacket or protection on the jacket.
- Insertion of the bus cables inside a complex round construction.
- In some cases possibility to differentiate bus and stub cable with a striped colour tape under the transparent jacket or the extrusion of a colour jacket.

Transfer impedance standard values (mΩ/m max)

TYPE OF CABLE	CONSTRUCTION	FREQUENCY			
		0 Hz	1 MHz	10 MHz	30 MHz
TWINAX BUS 10	A	30	40	100	200
TWINAX BUS 20	A	45	45	45	100
TWINAX BUS 21	B	15	5	5	10
TWINAX BUS 22	C	15	0.025	0.025	0.1
TWINAX BUS 31 or 61	B	20	10	10	10
TWINAX BUS 40	A	30	40	100	200
TWINAX BUS 41	B	15	5	5	10
TWINAX BUS 43 or 70	A	70	75	90	140
TWINAX BUS 44 or 71	B	30	30	15	15
TWINAX BUS 80	D	30	40	100	200

NOTE: The transfer impedance values of the TWINAX BUS 20, 21, 22 and 31 cables are specified in the corresponding standards. The values of the other cable types are guaranteed by AXON'.

Cable construction

PRODUCT DESIGNATION	VERSIONS	SPECIFICATION	CABLE TYPE	AWG	PRIMARY WIRE: CONDUCTOR MATERIALS AND CONSTRUCTION	PRIMARY WIRE: DIELECTRIC AND FILLER MATERIALS	SHIELD NOM. Ø (mm)	BRAID & TAPE MATERIAL	OUTER JACKET	INSULATED CABLE: OUTER Ø (mm)	INSULATED CABLE: WEIGHT (g/m)	CAPACITY pF/m
TWINAX BUS 10 **P502810**	A	MIL-STD-1553B MIL-C-17/176-00002	A	24	SPC alloy 19 x 0.127 mm	Extruded PTFE	2.60	Single braid: SPC alloy	PFA	3.15 to 3.40	26.80 max.	< 78.75
TWINAX BUS 20 **P502805**	A	MIL-STD-1553B NF-L-52161-1 pr EN 3375-003	A	24	SPC alloy 19 x 0.120 mm	Extruded PTFE	2.58	Single braid: SPC	FEP	3.10 to 3.30	24.00 max.	< 78.75
TWINAX BUS 21 **P512806**	A	MIL-STD-1553B NF-L-52161-2 pr EN 3375-004	B	24	SPC alloy 19 x 0.120 mm	Extruded PTFE	3.00	Double braid: SPC	FEP	3.60 to 3.80	37.00 max.	< 78.75
TWINAX BUS 22 **P512807**	A	MIL-STD-1553B NF-L-52161-3 pr EN 3375-005	C	24	SPC alloy 19 x 0.120 mm	Extruded PTFE	3.10	Double braid: SPC - High magnetic permeability tape	FEP	3.70 to 3.90	43.30 max.	< 78.75
TWINAX BUS 31 **PANAVIA BUS** **P507991**	E	MIL-STD-1553B PAN 6421	B	24	SPC alloy 19 x 0.118 mm	Polyimide tape and PTFE filler	3.24	Double braid: SPC	FEP	3.50 to 3.80	29.00 max.	< 98.40
TWINAX BUS 40 BUS BOEING/NASA NDBC-TFE-24S2SJ-75 **P512296**	S	MIL-STD-1553B SSQ 21655 Rev. E	A	24	SPC alloy 19 x 0.127 mm Silver plating 2µm	Extruded PTFE	2.58	Single braid: SPC alloy Silver plating 2µm	FEP	3.175 to 3.37	22.00 nom.	< 80.00
TWINAX BUS 41 **P546162**	S	MIL-STD-1553B	B	24	SPC alloy 19 x 0.120 mm Silver plating 2µm	Extruded PTFE	3.00	Double braid: SPC Silver plating 2µm	FEP	3.60 to 3.80	37.00 max.	< 78.75
TWINAX BUS 43 **P541610**	S	MIL-STD-1553B	A	26*	SPC alloy 19 x 0.102 mm Silver plating 2µm	Extruded PTFE	2.05	Single braid: SPC Silver plating 2µm	FEP	2.40 to 2.60	14.60 nom.	< 78.75
TWINAX BUS 44 **P530781**	S	MIL-STD-1553B	B	26*	SPC alloy 19 x 0.102 mm Silver plating 2µm	Extruded PTFE	2.40	Double braid: SPC Silver plating 2µm	FEP	2.80 to 3.00	20.00 nom.	< 80.00
TWINAX BUS 45 BUS BOEING/NASA NDBC-TFE-22S2SJ-75 **P812302**	S	MIL-STD-1553B SSQ 21655 Rev. E	A	22*	SPC alloy 19 x 0.16 mm Silver plating 2µm	CELLOFLON® expanded PTFE	3.09	Single braid: SPC alloy Silver plating 2µm	FEP	3.76 to 4.06	27.70 nom.	< 80.00
TWINAX BUS 60 **P819845**	A	MIL-STD-1553B	A	24	SPC alloy 19 x 0.127 mm	CELLOFLON® expanded PTFE	2.41	Single braid: SPC alloy	FEP	2.90 to 3.10	18.00 nom.	< 70.00
TWINAX BUS 61 **P815721**	A	MIL-STD-1553B	B	24	SPC alloy 19 x 0.127 mm	CELLOFLON® expanded PTFE	2.76	Double braid: SPC alloy	FEP	3.10 to 3.30	24.00 nom.	< 70.00
TWINAX BUS 70 **P504621**	A	MIL-STD-1553B	A	26*	SPC 19 x 0.102 mm	Extruded PTFE	2.05	Single braid: SPC	FEP	2.40 to 2.60	14.60 nom.	< 78.75
TWINAX BUS 71 **P517417**	A	MIL-STD-1553B ECS 0700	B	26*	SPC alloy 19 x 0.102 mm	Extruded PTFE	2.40	Double braid: SPC	FEP	2.80 to 3.00	21.00 max.	< 80.00
TWINAX BUS 72 **P511981**	A	MIL-STD-1553B	C	26	SPC 19 x 0.102 mm	Extruded PTFE	2.45	Double braid: SPC-High magnetic permeability tape	FEP	2.90 to 3.10	25.00 nom.	< 80.00
TWINAX BUS 80 ESCC 3902.002.20 **P538524**	S	ESCC 3902.002.20	D	24	SPC alloy 19 x 0.126 mm Silver plating 2µm	**Dielectric:** Wrapped PTFE **Filler:** Extruded PTFE	2.75	Single braid: SPC alloy Silver plating 2,5µm	PFA	3.90 max.	24.00 max.	<68.00

OTHER CABLES ON REQUEST.
SPC: Silver Plated Copper - * In case of AWG 26 or AWG 22 cable, please ask AXON' for compatibility with crimp connectors.
A = AERONAUTICS - E = EUROFIGHTER - S = SPACE
To see how are constructed each cable type, please see page E-6.

1 way in-line coupler

SPECIFICATIONS

Microcoupler
MIL-STD-1553B (STANAG 3838)
SSQ 21676 (NASA-BOEING)
PID (CNES), SPE-J-403-A-0070

Testing
AS-SAE-4115

Resistor
MIL-R-39007

Solder
ECSS-Q-ST-70-08,
MIL-STD-2000, NHB 5300.4.

Derating
ECSS-Q-ST-30-11

Potting material
ECSS-Q-ST-70-02, ASTM E595,
and ECSS-Q-ST-70-29
or NHB 8060.1.

Connector assemblies
ECSS-Q-ST-70-26
or NHB 5300.4.

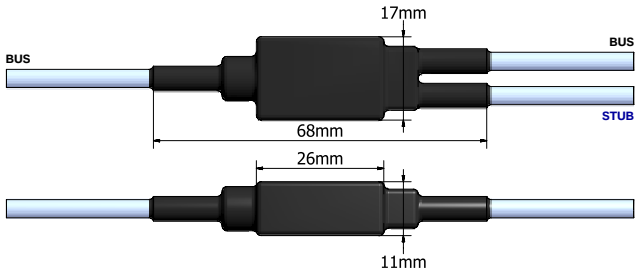
Transformer
JN1081 approved
DDP-J-403-A-022
ESA approved
(COF-BCS-PAD01)

All processes, materials
and components are
approved by CNES
(see CNES-PID-02-AXON')
and BOEING/NASA.

ESA: European Space Agency
CNES: French Space Agency
PID: Part Identification Document

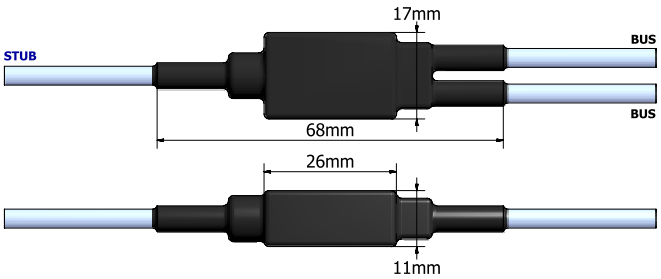
AMB / S - C1 - XX

Version with bus lines on opposite sides of the coupler.



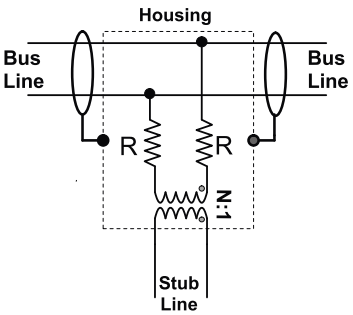
AMB / S - C11 - XX

Version with bus lines on same side of the coupler.



Electrical scheme

N = 1.41 ±3%
R = fault protection resistance
R = 0.75 Zo = 57.6 Ω ±1%



Identification code

AMB /	S	CX	XX
AXON' MICROBUS (see complete reference of the coupler on Bus Standard sheet, page E-4).	**S: SPACE VERSION**	**1: 1 WAY IN-LINE COUPLER** Version with bus lines on opposite sides of the coupler. **11: 1 WAY IN-LINE COUPLER** Version with bus lines on same side of the coupler.	CABLE REFERENCES **40: TWINAX BUS AWG 24 SB** (single braid) acc. to SSQ 21655 (NASA qualified). **41: TWINAX BUS AWG 24 DB** (double braid). **43: TWINAX BUS AWG 26 SB** (single braid). **44: TWINAX BUS AWG 26 DB** (double braid). **45: TWINAX BUS AWG 22 SB** (single braid) acc. to SSQ 21655 (NASA qualified). **80: TWINAX BUS AWG 24 SB** (single braid) according to ESCC 3902.002.20.

NOTE: CABLE LENGTH AND CABLE COLOUR TO BE DEFINED WHEN ORDERING (possibility to differentiate bus and stub cable with a striped colour tape under the transparent jacket or the extrusion of a colour jacket).
See page E-10 for couplers with integrated terminator(s).

Electrical characteristics

PARAMETERS	REQUIRED	ACTUAL
Nominal line impedance*	70 to 84 Ω	77 Ω
Turn ratio	1.41 ±3%	1.41 ±3%
CMR	< -45 dB at 1 MHz	< -50 dB at 1 MHz
Input impedance	> 3000 Ω in the frequency range (75 kHz to 1 MHz) and in the indicated temp. range (-65°C to 150°C)	> 3000 Ω
Fault protection insulation resistors in series on each bus winding connection	0.75 Zo ±2%	57.6 Ω ±1%
Insulation resistance between: - bus / stub - inner wires / shield	 100 MΩ 100 MΩ	 > 1 000 MΩ at 250 VDC > 1 000 MΩ at 500 VDC
Transfer impedance	-	plot available
Shield continuity	-	10 mΩ maximum
Shield coverage	Cable 90% Connection 75%	Cable 90% minimum Connection 100%
Dielectric withstanding strength: - between shield and inner wires - between outer insulation and shield	 500 VRMS 500 VRMS	 500 VRMS 500 VRMS

* Impedance: seen from the stub when the bus line is loaded with Zo at both sides of the coupler.

Environmental characteristics

PARAMETERS	REQUIRED	ACTUAL
Operating temperature	-	-65°C to +150°C
Out-gassing	SP-R-0022 - TML < 1% ASTM-E-595 - CVCM < 0.1% ECSS-Q-ST-70-02	TML = 0.0005% RML = 0000027% CVCM = 0%
Off-gassing	NHB 8060.1 Test 7 ECSS-Q-ST-70-29	T = 0.00024 for 65 m^3 volume per coupler* MLW (#) = 2112 for 65 m^3 volume*
MTBF according to MIL HDBK-217	-	5.25 x 10^7 hrs at 25°C and Space Flight environment

Out and Off-gassing results, flammability available for all materials used.
* Typical values obtained by AMB/S-C1 coupler during qualification phase.

Mechanical characteristics

PARAMETERS	REQUIRED	ACTUAL
Weight	-	≤ 10 g
Life test	-	1000 hrs at 120°C
Shocks	-	15 *g*'s in all directions
Acceleration		20 *g*'s in all directions
Random vibrations	MIL-STD-810, Method 514.5	Fonctional at 120°C = 16.35 *g* RMS Endurance at 20°C = 33.23 *g* RMS

Other mechanical and environmental tests available on request.

Transformer characteristics

PARAMETERS	REQUIRED VALUES (MIL-STD-1553B or SAE AS-4115)	NOMINAL VALUE OR AXON' REQUIRED VALUE		
		NOMINAL VALUE		REQUIRED BY AXON' / QUALITY PLAN
The Curie point	-	-		Over 195°C
Turn ratio	√2 ±3%	√2 ±3%		√2 ±3%
Secondary DC resistance	Rs < 5 Ω	Rs = 2 Ω		Rs < 2.5 Ω
Insulation resistance (winding to winding)	Ri > 100 MΩ	-		Ri > 1 000 MΩ with a 250 VDC test voltage
Transformer open circuit impedance	IZI > 3 kΩ on full temperature operating range	IZI > 10 kΩ at 25°C IZI > 4.8 kΩ at -65°C	IZI > 4 kΩ at -85°C	IZI > 9.4 kΩ at 25°C***
Primary parallel inductance	-	22 mH		> 20 mH
Primary parallel capacitance	-	10 pF		< 11.4 pF
Inter-winding capacitance	-	45 pF		-
Primary leakage inductance	-	-		< 6.0 µH
Droop*	< 20%	4.5%**		< 20%**
Overshoot and ringing*	±1 V	0.30 V**		< ±1 V**

* Tested with a 250 kHz square waveform of 27 VPP with 100 ns rise and fall times through a 360 ±5% Ω resistor.
** Average values taken during the JN1081N qualification.
*** 9.4 kΩ at 25°C guarantees 3 kΩ from -65°C to +150°C

1 way in-line coupler with terminator

SPECIFICATIONS

Microcoupler
MIL-STD-1553B (STANAG 3838)
SSQ 21676 (NASA-BOEING)
PID (CNES), SPE-J-403-A-0070

Testing
AS-SAE-4115

Resistor
MIL-R-39007

Solder
ECSS-Q-ST-70-08,
MIL-STD-2000, NHB 5300.4.

Derating
ECSS-Q-ST-30-11

Potting material
ECSS-Q-ST-70-02, ASTM E595,
and ECSS-Q-ST-70-29
or NHB 8060.1.

Connector assemblies
ECSS-Q-ST-70-26
or NHB 5300.4.

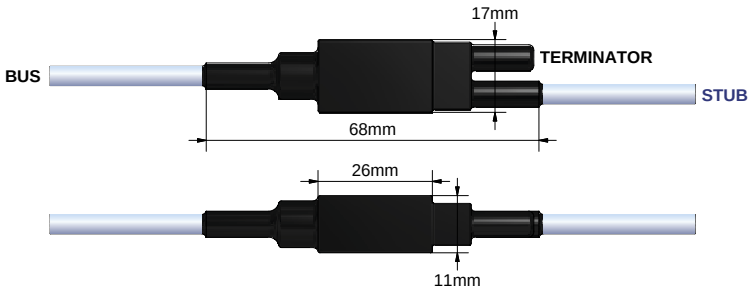
Transformer
JN1081 approved
DDP-J-403-A-022
ESA approved
(COF-BCS-PAD01)

All processes, materials
and components are
approved by CNES
(see CNES-PID-02-AXON')
and BOEING/NASA.

ESA: European Space Agency
CNES: French Space Agency
PID: Part Identification Document

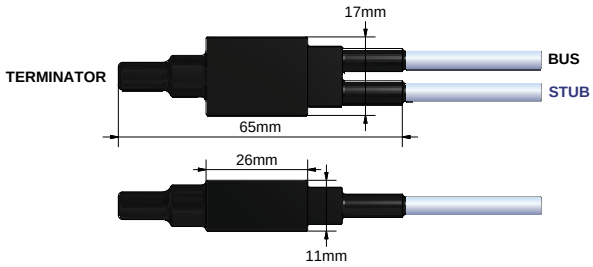
AMB / S - C1 - XX - T RIGHT 'TR'

Version with bus and stub lines on opposite sides of the coupler.



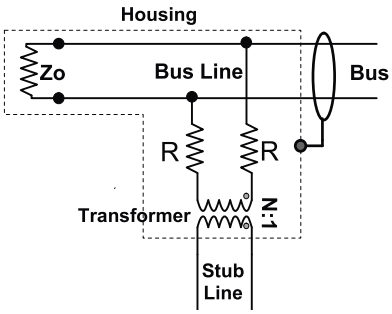
AMB / S - C1 - XX - T LEFT 'TL'

Version with bus and stub lines on same side of the coupler.



Electrical scheme

N = 1.41 ±3%
R = fault protection resistance
R = 0.75 Zo = 57.6 Ω ±1%



Identification code

AMB /	S	CX	XX	XX
AXON' MICROBUS (see complete reference of the coupler on Bus Standard sheet, page E-4).	**S: SPACE VERSION**	**1: 1 WAY IN-LINE COUPLER** Version with bus lines on opposite sides of the coupler.	CABLE REFERENCES **40: TWINAX BUS AWG 24 SB** (single braid) acc. to SSQ 21655 (NASA qualified). **41: TWINAX BUS AWG 24 DB** (double braid). **43: TWINAX BUS AWG 26 SB** (single braid). **44: TWINAX BUS AWG 26 DB** (double braid). **45: TWINAX BUS AWG 22 SB** (single braid) acc. to SSQ 21655 (NASA qualified). **80: TWINAX BUS AWG 24 SB** (single braid) according to ESCC 3902.002.20.	**TR: T RIGHT** Bus and stub on opposite sides. **TL: T LEFT** Bus and stub on same side of the coupler.

NOTE: CABLE LENGTH AND CABLE COLOUR TO BE DEFINED WHEN ORDERING (possibility to differentiate bus and stub cable with a striped colour tape under the transparent jacket or the extrusion of a colour jacket).
See page E-8 for couplers without integrated terminator(s).

Electrical characteristics

PARAMETERS	REQUIRED	ACTUAL
Nominal line impedance*	70 to 84 Ω	77 Ω
Turn ratio	1.41 ±3%	1.41 ±3%
CMR	< -45 dB at 1 MHz	< -50 dB at 1 MHz
Terminator impedance	77 Ω ±2%	77 Ω ±1%
Fault protection insulation resistors in series on each bus winding connection	0.75 Zo ±2%	57.6 Ω ±1%
Insulation resistance between: - bus / stub - inner wires / shield	 100 MΩ 100 MΩ	 > 1 000 MΩ at 250 VDC > 1 000 MΩ at 500 VDC
Transfer impedance	-	plot available
Shield continuity	-	10 mΩ maximum
Shield coverage	Cable 90% Connection 75%	Cable 90% minimum Connection 100%
Dielectric withstanding strength: - between shield and inner wires - between outer insulation and shield	 500 VRMS 500 VRMS	 500 VRMS 500 VRMS

* Impedance: seen from the stub when the bus line is loaded with Zo at both sides of the coupler.

Environmental characteristics

PARAMETERS	REQUIRED	ACTUAL
Operating temperature	-	-65°C to +150°C
Out-gassing	SP-R-0022 - TML < 1% ASTM-E-595 - CVCM < 0.1% ECSS-Q-ST-70-02	TML = 0.0005% RML = 0000027% CVCM = 0%
Off-gassing	NHB 8060.1 Test 7 ECSS-Q-ST-70-29	T = 0.00024 for 65 m^3 volume per coupler* MLW (#) = 2112 for 65 m^3 volume*
MTBF according to MIL HDBK-217	-	5.24 x 10^7 hrs at 25°C and Space Flight environment

Out and Off-gassing results, flammability available for all materials used.
* Typical values obtained by AMB/S-C1 coupler during qualification phase.

Mechanical characteristics

PARAMETERS	REQUIRED	ACTUAL
Weight	-	≤ 12 g
Life test	-	1000 hrs at 120°C
Shocks	-	15 *g*'s in all directions
Acceleration		20 *g*'s in all directions
Random vibrations	MIL-STD-810, Method 514.5	Fonctional at 120°C = 16.35 *g* RMS Endurance at 20°C = 33.23 *g* RMS

Other mechanical and environmental tests available on request.

Transformer characteristics

PARAMETERS	REQUIRED VALUES (MIL-STD-1553B or SAE AS-4115)	NOMINAL VALUE OR AXON' REQUIRED VALUE	
		NOMINAL VALUE	REQUIRED BY AXON' / QUALITY PLAN
The Curie point	-	-	Over 195°C
Turn ratio	√2 ±3%	√2 ±3%	√2 ±3%
Secondary DC resistance	Rs < 5 Ω	Rs = 2 Ω	Rs < 2.5 Ω
Insulation resistance (winding to winding)	Ri > 100 MΩ	-	Ri > 1 000 MΩ with a 250 VDC test voltage
Transformer open circuit impedance	IZI > 3 kΩ on full temperature operating range	IZI > 10 kΩ at 25°C IZI > 4.8 kΩ at -65°C IZI > 4 kΩ at -85°C	IZI > 9.4 kΩ at 25°C***
Primary parallel inductance	-	22 mH	> 20 mH
Primary parallel capacitance	-	10 pF	< 11.4 pF
Inter-winding capacitance	-	45 pF	-
Primary leakage inductance	-	-	< 6.0 µH
Droop*	< 20%	4.5%**	< 20%**
Overshoot and ringing*	±1 V	0.30 V**	< ±1 V**

* Tested with a 250 kHz square waveform of 27 VPP with 100 ns rise and fall times through a 360 ±5% Ω resistor.
** Average values taken during the JN1081N qualification.
*** 9.4 kΩ at 25°C guarantees 3 kΩ from -65°C to +150°C

2 way in-line coupler

SPECIFICATIONS

Microcoupler
MIL-STD-1553B (STANAG 3838)
SSQ 21676 (NASA-BOEING)
PID (CNES), SPE-J-403-A-0070

Testing
AS-SAE-4115

Resistor
MIL-R-39007

Solder
ECSS-Q-ST-70-08,
MIL-STD-2000, NHB 5300.4.

Derating
ECSS-Q-ST-30-11

Potting material
ECSS-Q-ST-70-02, ASTM E595,
and ECSS-Q-ST-70-29
or NHB 8060.1.

Connector assemblies
ECSS-Q-ST-70-26
or NHB 5300.4.

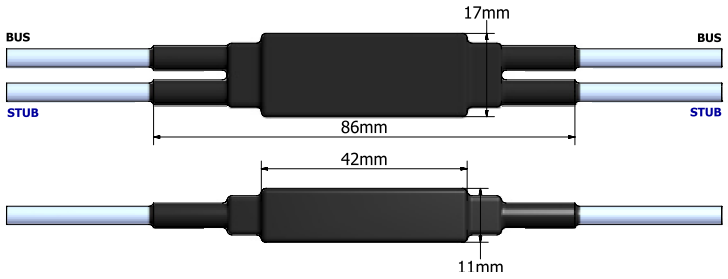
Transformer
JN1081 approved
DDP-J-403-A-022
ESA approved
(COF-BCS-PAD01)

All processes, materials
and components are
approved by CNES
(see CNES-PID-02-AXON')
and BOEING/NASA.

ESA: European Space Agency
CNES: French Space Agency
PID: Part Identification Document

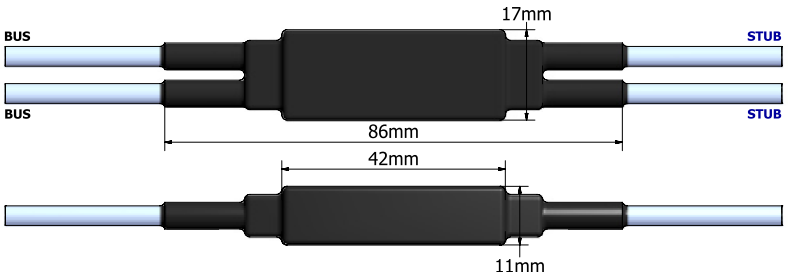
AMB / S - C2 - XX

Version with bus lines on opposite sides of the coupler.



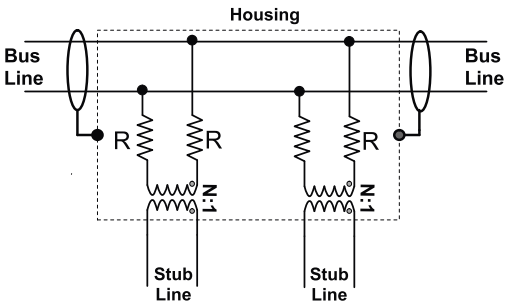
AMB / S - C21 - XX

Version with bus lines on same side of the coupler.



Electrical scheme

N = 1.41 ±3%
R = fault protection resistance
R = 0.75 Zo = 57.6 Ω ±1%



Identification code

AMB /	S	CX	XX
AXON' MICROBUS (see complete reference of the coupler on Bus Standard sheet, page E-4).	**S: SPACE VERSION**	**2: 2 WAY INLINE COUPLER** Version with bus lines on opposite sides of the coupler. **21: 2 WAY INLINE COUPLER** Version with bus lines on same side of the coupler.	CABLE REFERENCES **40: TWINAX BUS AWG 24 SB** (single braid) acc. to SSQ 21655 (NASA qualified). **41: TWINAX BUS AWG 24 DB** (double braid). **43: TWINAX BUS AWG 26 SB** (single braid). **44: TWINAX BUS AWG 26 DB** (double braid). **45: TWINAX BUS AWG 22 SB** (single braid) acc. to SSQ 21655 (NASA qualified). **80: TWINAX BUS AWG 24 SB** (single braid) according to ESCC 3902.002.20.

NOTE: CABLE LENGTH AND CABLE COLOUR TO BE DEFINED WHEN ORDERING (possibility to differentiate bus and stub cable with a striped colour tape under the transparent jacket or the extrusion of a colour jacket).
See page E-14 for couplers with integrated terminator(s).

Electrical characteristics

PARAMETERS	REQUIRED	ACTUAL
Nominal line impedance*	70 to 84 Ω	77 Ω
Turn ratio	1.41 ±3%	1.41 ±3%
CMR	< -45 dB at 1 MHz	< -50 dB at 1 MHz
Input impedance	> 1500 Ω in the frequency range (75 kHz to 1 MHz) and in the indicated temp. range (-65°C to 150°C)	> 1500 Ω
Fault protection insulation resistors in series on each bus winding connection	0.75 Zo ±2%	57.6 Ω ±1%
Insulation resistance between: - bus / stub - inner wires / shield	 100 MΩ 100 MΩ	 > 1 000 MΩ at 250 VDC > 1 000 MΩ at 500 VDC
Transfer impedance	-	plot available
Shield continuity	-	10 mΩ maximum
Shield coverage	Cable 90% Connection 75%	Cable 90% minimum Connection 100%
Dielectric withstanding strength: - between shield and inner wires - between outer insulation and shield	 500 VRMS 500 VRMS	 500 VRMS 500 VRMS

* Impedance: seen from the stub when the bus line is loaded with Zo at both sides of the coupler.

Environmental characteristics

PARAMETERS	REQUIRED	ACTUAL
Operating temperature	-	-65°C to +150°C
Out-gassing	SP-R-0022 - TML < 1% ASTM-E-595 - CVCM < 0.1% ECSS-Q-ST-70-02	TML = 0.0005% RML = 0000027% CVCM = 0%
Off-gassing	NHB 8060.1 Test 7 ECSS-Q-ST-70-29	T = 0.00024 for 65 m^3 volume per coupler* MLW (#) = 2112 for 65 m^3 volume*
MTBF according to MIL HDBK-217	-	2.75 x 10^7 hrs at 25°C and Space Flight environment

Out and Off-gassing results, flammability available for all materials used.
* Typical values obtained by AMB/S-C1 coupler during qualification phase.

Mechanical characteristics

PARAMETERS	REQUIRED	ACTUAL
Weight	-	≤ 16 g
Life test	-	1000 hrs at 120°C
Shocks	-	15 *g*'s in all directions
Acceleration		20 *g*'s in all directions
Random vibrations	MIL-STD-810, Method 514.5	Fonctional at 120°C = 16.35 g RMS Endurance at 20°C = 33.23 g RMS

Other mechanical and environmental tests available on request.

Transformer characteristics

PARAMETERS	REQUIRED VALUES (MIL-STD-1553B or SAE AS-4115)	NOMINAL VALUE OR AXON' REQUIRED VALUE		
		NOMINAL VALUE		REQUIRED BY AXON' / QUALITY PLAN
The Curie point	-	-		Over 195°C
Turn ratio	√2 ±3%	√2 ±3%		√2 ±3%
Secondary DC resistance	Rs < 5 Ω	Rs = 2 Ω		Rs < 2.5 Ω
Insulation resistance (winding to winding)	Ri > 100 MΩ	-		Ri > 1 000 MΩ with a 250 VDC test voltage
Transformer open circuit impedance	IZI > 3 kΩ on full temperature operating range	IZI > 10 kΩ at 25°C IZI > 4.8 kΩ at -65°C	IZI > 4 kΩ at -85°C	IZI > 9.4 kΩ at 25°C***
Primary parallel inductance	-	22 mH		> 20 mH
Primary parallel capacitance	-	10 pF		< 11.4 pF
Inter-winding capacitance	-	45 pF		-
Primary leakage inductance	-	-		< 6.0 µH
Droop*	< 20%	4.5%**		< 20%**
Overshoot and ringing*	±1 V	0.30 V**		< ±1 V**

* Tested with a 250 kHz square waveform of 27 VPP with 100 ns rise and fall times through a 360 ±5% Ω resistor.
** Average values taken during the JN1081N qualification.
*** 9.4 kΩ at 25°C guarantees 3 kΩ from -65°C to +150°C

2 way in-line coupler with terminator

SPECIFICATIONS

Microcoupler
MIL-STD-1553B (STANAG 3838)
SSQ 21676 (NASA-BOEING)
PID (CNES), SPE-J-403-A-0070

Testing
AS-SAE-4115

Resistor
MIL-R-39007

Solder
ECSS-Q-ST-70-08,
MIL-STD-2000, NHB 5300.4.

Derating
ECSS-Q-ST-30-11

Potting material
ECSS-Q-ST-70-02, ASTM E595,
and ECSS-Q-ST-70-29
or NHB 8060.1.

Connector assemblies
ECSS-Q-ST-70-26
or NHB 5300.4.

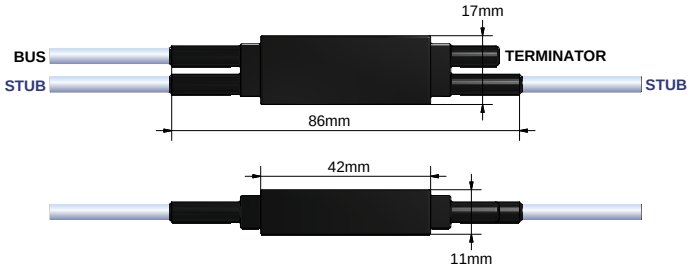
Transformer
JN1081 approved
DDP-J-403-A-022
ESA approved
(COF-BCS-PAD01)

All processes, materials
and components are
approved by CNES
(see CNES-PID-02-AXON')
and BOEING/NASA.

ESA: European Space Agency
CNES: French Space Agency
PID: Part Identification Document

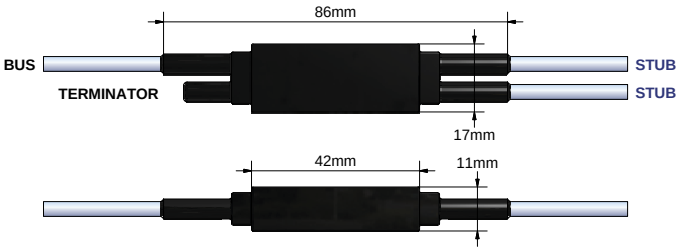
AMB / S - C2 - XX - T RIGHT 'TR'

Version with bus lines on opposite sides of the coupler.



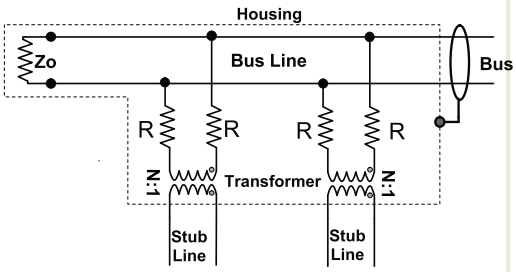
AMB / S - C21 - XX - T LEFT 'TL'

Version with bus lines on same side of the coupler.



Electrical scheme

N = 1.41 ±3%
R = fault protection resistance
R = 0.75 Zo = 57.6 Ω ±1%



Identification code

AMB /	S	CX	XX	XX
AXON' MICROBUS (see complete reference of the coupler on Bus Standard sheet, page E-4).	**S: SPACE VERSION**	**2: 2 WAY INLINE COUPLER** Version with bus lines on opposite sides of the coupler. **21: 2 WAY INLINE COUPLER** Version with bus lines on same side of the coupler.	CABLE REFERENCES **40: TWINAX BUS AWG 24 SB** (single braid) acc. to SSQ 21655 (NASA qualified). **41: TWINAX BUS AWG 24 DB** (double braid). **43: TWINAX BUS AWG 26 SB** (single braid). **44: TWINAX BUS AWG 26 DB** (double braid). **45: TWINAX BUS AWG 22 SB** (single braid) acc. to SSQ 21655 (NASA qualified). **80: TWINAX BUS AWG 24 SB** (single braid) according to ESCC 3902.002.20.	**TR: T RIGHT** Bus and stub on opposite sides. **TL: T LEFT** Bus and stub on same side of the coupler.

NOTE: CABLE LENGTH AND CABLE COLOUR TO BE DEFINED WHEN ORDERING (possibility to differentiate bus and stub cable with a striped colour tape under the transparent jacket or the extrusion of a colour jacket).
See page E-12 for couplers without integrated terminator(s).

Electrical characteristics

PARAMETERS	REQUIRED	ACTUAL
Nominal line impedance*	70 to 84 Ω	77 Ω
Turn ratio	1.41 ±3%	1.41 ±3%
CMR	< -45 dB at 1 MHz	< -50 dB at 1 MHz
Terminator impedance	77 Ω ±2%	77 Ω ±1%
Fault protection insulation resistors in series on each bus winding connection	0.75 Zo ±2%	57.6 Ω ±1%
Insulation resistance between: - bus / stub - inner wires / shield	 100 MΩ 100 MΩ	 > 1 000 MΩ at 250 VDC > 1 000 MΩ at 500 VDC
Transfer impedance	-	plot available
Shield continuity	-	10 mΩ maximum
Shield coverage	Cable 90% Connection 75%	Cable 90% minimum Connection 100%
Dielectric withstanding strength: - between shield and inner wires - between outer insulation and shield	 500 VRMS 500 VRMS	 500 VRMS 500 VRMS

* Impedance: seen from the stub when the bus line is loaded with Zo at both sides of the coupler.

Environmental characteristics

PARAMETERS	REQUIRED	ACTUAL
Operating temperature	-	-65°C to +150°C
Out-gassing	SP-R-0022 - TML < 1% ASTM-E-595 - CVCM < 0.1% ECSS-Q-ST-70-02	TML = 0.0005% RML = 0000027% CVCM = 0%
Off-gassing	NHB 8060.1 Test 7 ECSS-Q-ST-70-29	T = 0.00024 for 65 m^3 volume per coupler* MLW (#) = 2112 for 65 m^3 volume*
MTBF according to MIL HDBK-217	-	2.75 x 10^7 hrs at 25°C and Space Flight environment

Out and Off-gassing results, flammability available for all materials used.
* Typical values obtained by AMB/S-C1 coupler during qualification phase.

Mechanical characteristics

PARAMETERS	REQUIRED	ACTUAL
Weight	-	≤ 18 g
Life test	-	1000 hrs at 120°C
Shocks	-	15 *g*'s in all directions
Acceleration		20 *g*'s in all directions
Random vibrations	MIL-STD-810, Method 514.5	Fonctional at 120°C = 16.35 *g* RMS Endurance at 20°C = 33.23 *g* RMS

Other mechanical and environmental tests available on request.

Transformer characteristics

PARAMETERS	REQUIRED VALUES (MIL-STD-1553B or SAE AS-4115)	NOMINAL VALUE OR AXON' REQUIRED VALUE		
		NOMINAL VALUE		REQUIRED BY AXON' / QUALITY PLAN
The Curie point	-	-		Over 195°C
Turn ratio	√2 ±3%	√2 ±3%		√2 ±3%
Secondary DC resistance	Rs < 5 Ω	Rs = 2 Ω		Rs < 2.5 Ω
Insulation resistance (winding to winding)	Ri > 100 MΩ	-		Ri > 1 000 MΩ with a 250 VDC test voltage
Transformer open circuit impedance	IZI > 3 kΩ on full temperature operating range	IZI > 10 kΩ at 25°C IZI > 4.8 kΩ at -65°C	IZI > 4 kΩ at -85°C	IZI > 9.4 kΩ at 25°C***
Primary parallel inductance	-	22 mH		> 20 mH
Primary parallel capacitance	-	10 pF		< 11.4 pF
Inter-winding capacitance	-	45 pF		-
Primary leakage inductance	-	-		< 6.0 µH
Droop*	< 20%	4.5%**		< 20%**
Overshoot and ringing*	±1 V	0.30 V**		< ±1 V**

* Tested with a 250 kHz square waveform of 27 VPP with 100 ns rise and fall times through a 360 ±5% Ω resistor.
** Average values taken during the JN1081N qualification.
*** 9.4 kΩ at 25°C guarantees 3 kΩ from -65°C to +150°C

3 way in-line coupler

SPECIFICATIONS

Microcoupler
MIL-STD-1553B (STANAG 3838)
SSQ 21676 (NASA-BOEING)
PID (CNES), SPE-J-403-A-0070

Testing
AS-SAE-4115

Resistor
MIL-R-39007

Solder
ECSS-Q-ST-70-08,
MIL-STD-2000, NHB 5300.4.

Derating
ECSS-Q-ST-30-11

Potting material
ECSS-Q-ST-70-02, ASTM E595,
and ECSS-Q-ST-70-29
or NHB 8060.1.

Connector assemblies
ECSS-Q-ST-70-26
or NHB 5300.4.

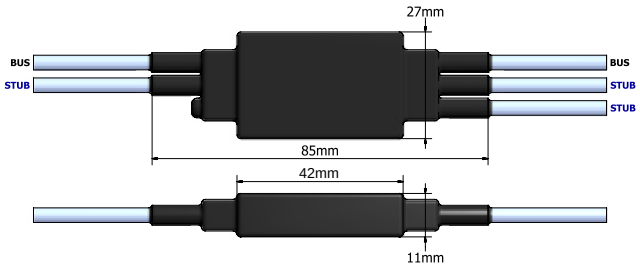
Transformer
JN1081 approved
DDP-J-403-A-022
ESA approved
(COF-BCS-PAD01)

All processes, materials
and components are
approved by CNES
(see CNES-PID-02-AXON')
and BOEING/NASA.

ESA: European Space Agency
CNES: French Space Agency
PID: Part Identification Document

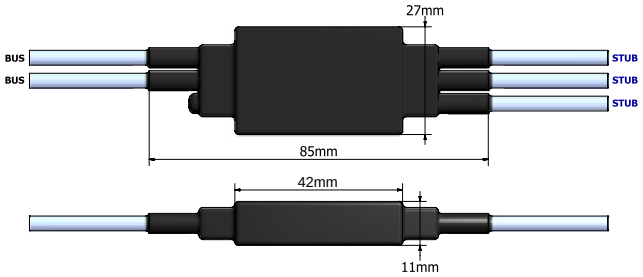
AMB / S - C3 - XX

Version with bus lines on opposite sides of the coupler.



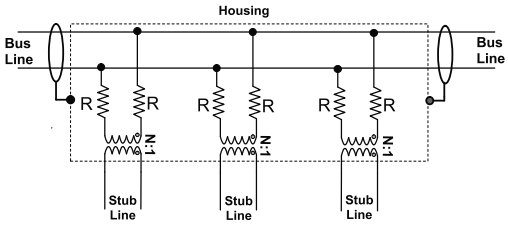
AMB / S - C31 - XX

Version with bus lines on same side of the coupler.



Electrical scheme

N = 1.41 ±3%
R = fault protection resistance
R = 0.75 Zo = 57.6 Ω ±1%



Identification code

AMB /	S	CX	XX
AXON' MICROBUS (see complete reference of the coupler on Bus Standard sheet, page E-4).	**S: SPACE VERSION**	**3: 3 WAY IN-LINE COUPLER** Version with bus lines on opposite sides of the coupler. **31: 3 WAY IN-LINE COUPLER** Version with bus lines on same side of the coupler.	CABLE REFERENCES **40: TWINAX BUS AWG 24 SB** (single braid) acc. to SSQ 21655 (NASA qualified). **41: TWINAX BUS AWG 24 DB** (double braid). **43: TWINAX BUS AWG 26 SB** (single braid). **44: TWINAX BUS AWG 26 DB** (double braid). **45: TWINAX BUS AWG 22 SB** (single braid) acc. to SSQ 21655 (NASA qualified). **80: TWINAX BUS AWG 24 SB** (single braid) according to ESCC 3902.002.20.

NOTE: CABLE LENGTH AND CABLE COLOUR TO BE DEFINED WHEN ORDERING (possibility to differentiate bus and stub cable with a striped colour tape under the transparent jacket or the extrusion of a colour jacket).
See page E-18 for couplers with integrated terminator(s).

Electrical characteristics

PARAMETERS	REQUIRED	ACTUAL
Nominal line impedance*	70 to 84 Ω	77 Ω
Turn ratio	1.41 ±3%	1.41 ±3%
CMR	< -45 dB at 1 MHz	< -50 dB at 1 MHz
Input impedance	> 1000 Ω in the frequency range (75 kHz to 1 MHz) and in the indicated temp. range (-65°C to 150°C)	> 1000 Ω
Fault protection insulation resistors in series on each bus winding connection	0.75 Zo ±2%	57.6 Ω ±1%
Insulation resistance between: - bus / stub - inner wires / shield	 100 MΩ 100 MΩ	 > 1 000 MΩ at 250 VDC > 1 000 MΩ at 500 VDC
Transfer impedance	-	plot available
Shield continuity	-	10 mΩ maximum
Shield coverage	Cable 90% Connection 75%	Cable 90% minimum Connection 100%
Dielectric withstanding strength: - between shield and inner wires - between outer insulation and shield	 500 VRMS 500 VRMS	 500 VRMS 500 VRMS

* Impedance: seen from the stub when the bus line is loaded with Zo at both sides of the coupler.

Environmental characteristics

PARAMETERS	REQUIRED	ACTUAL
Operating temperature	-	-65°C to +150°C
Out-gassing	SP-R-0022 - TML < 1% ASTM-E-595 - CVCM < 0.1% ECSS-Q-ST-70-02	TML = 0.0005% RML = 0000027% CVCM = 0%
Off-gassing	NHB 8060.1 Test 7 ECSS-Q-ST-70-29	T = 0.00024 for 65 m^3 volume per coupler* MLW (#) = 2112 for 65 m^3 volume*
MTBF according to MIL HDBK-217	-	1.87 x 10^7 hrs at 25°C and Space Flight environment

Out and Off-gassing results, flammability available for all materials used.
* Typical values obtained by AMB/S-C1 coupler during qualification phase.

Mechanical characteristics

PARAMETERS	REQUIRED	ACTUAL
Weight	-	≤ 25 g
Life test	-	1000 hrs at 120°C
Shocks	-	15 *g*'s in all directions
Acceleration		20 *g*'s in all directions
Random vibrations	MIL-STD-810, Method 514.5	Fonctional at 120°C = 16.35 *g* RMS Endurance at 20°C = 33.23 *g* RMS

Other mechanical and environmental tests available on request.

Transformer characteristics

PARAMETERS	REQUIRED VALUES (MIL-STD-1553B or SAE AS-4115)	NOMINAL VALUE OR AXON' REQUIRED VALUE		
		NOMINAL VALUE		REQUIRED BY AXON' / QUALITY PLAN
The Curie point	-	-		Over 195°C
Turn ratio	√2 ±3%	√2 ±3%		√2 ±3%
Secondary DC resistance	Rs < 5 Ω	Rs = 2 Ω		Rs < 2.5 Ω
Insulation resistance (winding to winding)	Ri > 100 MΩ	-		Ri > 1 000 MΩ with a 250 VDC test voltage
Transformer open circuit impedance	IZI > 3 kΩ on full temperature operating range	IZI > 10 kΩ at 25°C IZI > 4.8 kΩ at -65°C	IZI > 4 kΩ at -85°C	IZI > 9.4 kΩ at 25°C***
Primary parallel inductance	-	22 mH		> 20 mH
Primary parallel capacitance	-	10 pF		< 11.4 pF
Inter-winding capacitance	-	45 pF		-
Primary leakage inductance	-	-		< 6.0 µH
Droop*	< 20%	4.5%**		< 20%**
Overshoot and ringing*	±1 V	0.30 V**		< ±1 V**

* Tested with a 250 kHz square waveform of 27 VPP with 100 ns rise and fall times through a 360 ±5% Ω resistor.
** Average values taken during the JN1081N qualification.
*** 9.4 kΩ at 25°C guarantees 3 kΩ from -65°C to +150°C

3 way in-line coupler with terminator

SPECIFICATIONS

Microcoupler
MIL-STD-1553B (STANAG 3838)
SSQ 21676 (NASA-BOEING)
PID (CNES), SPE-J-403-A-0070

Testing
AS-SAE-4115

Resistor
MIL-R-39007

Solder
ECSS-Q-ST-70-08,
MIL-STD-2000, NHB 5300.4.

Derating
ECSS-Q-ST-30-11

Potting material
ECSS-Q-ST-70-02, ASTM E595,
and ECSS-Q-ST-70-29
or NHB 8060.1.

Connector assemblies
ECSS-Q-ST-70-26
or NHB 5300.4.

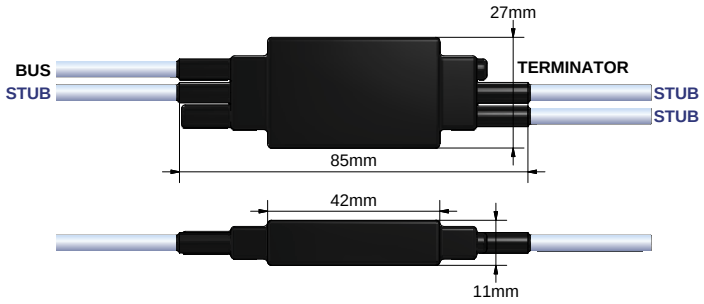
Transformer
JN1081 approved
DDP-J-403-A-022
ESA approved
(COF-BCS-PAD01)

All processes, materials
and components are
approved by CNES
(see CNES-PID-02-AXON')
and BOEING/NASA.

ESA: European Space Agency
CNES: French Space Agency
PID: Part Identification Document

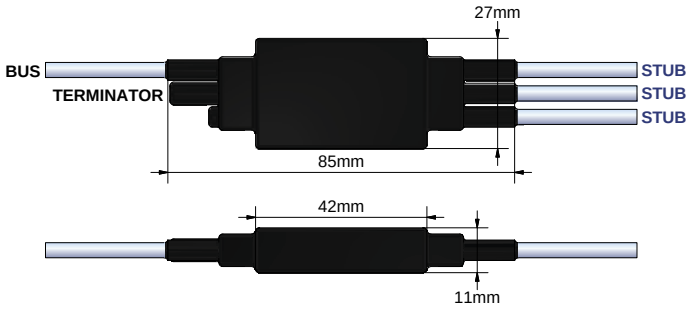
AMB / S - C3 - XX - T RIGHT 'TR'

Version with bus lines on opposite sides of the coupler.



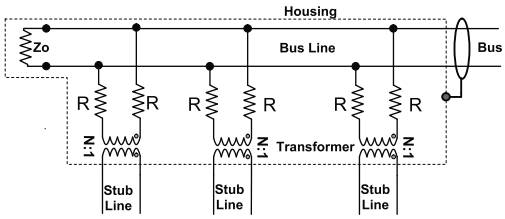
AMB / S - C31 - XX - T LEFT 'TL'

Version with bus lines on same side of the coupler.



Electrical scheme

N = 1.41 ±3%
R = fault protection resistance
R = 0.75 Zo = 57.6 Ω ±1%



Identification code

AMB /	S	CX	XX	XX
AXON' MICROBUS (see complete reference of the coupler on Bus Standard sheet, page E-4).	**S: SPACE VERSION**	**3: 3 WAY IN-LINE COUPLER** Version with bus lines on opposite sides of the coupler. **31: 3 WAY IN-LINE COUPLER** Version with bus lines on same side of the coupler.	CABLE REFERENCES **40: TWINAX BUS AWG 24 SB** (single braid) acc. to SSQ 21655 (NASA qualified). **41: TWINAX BUS AWG 24 DB** (double braid). **43: TWINAX BUS AWG 26 SB** (single braid). **44: TWINAX BUS AWG 26 DB** (double braid). **45: TWINAX BUS AWG 22 SB** (single braid) acc. to SSQ 21655 (NASA qualified). **80: TWINAX BUS AWG 24 SB** (single braid) according to ESCC 3902.002.20.	**TR: T RIGHT** Bus and stub on opposite sides. **TL: T LEFT** Bus and stub on same side of the coupler.

NOTE: CABLE LENGTH AND CABLE COLOUR TO BE DEFINED WHEN ORDERING (possibility to differentiate bus and stub cable with a striped colour tape under the transparent jacket or the extrusion of a colour jacket).
See page E-16 for couplers without integrated terminator(s).

Electrical characteristics

PARAMETERS	REQUIRED	ACTUAL
Nominal line impedance*	70 to 84 Ω	77 Ω
Turn ratio	1.41 ±3%	1.41 ±3%
CMR	< -45 dB at 1 MHz	< -50 dB at 1 MHz
Terminator impedance	77 Ω ±2%	77 Ω ±1%
Fault protection insulation resistors in series on each bus winding connection	0.75 Zo ±2%	57.6 Ω ±1%
Insulation resistance between: - bus / stub - inner wires / shield	 100 MΩ 100 MΩ	 > 1 000 MΩ at 250 VDC > 1 000 MΩ at 500 VDC
Transfer impedance	-	plot available
Shield continuity	-	10 mΩ maximum
Shield coverage	Cable 90% Connection 75%	Cable 90% minimum Connection 100%
Dielectric withstanding strength: - between shield and inner wires - between outer insulation and shield	 500 VRMS 500 VRMS	 500 VRMS 500 VRMS

* Impedance: seen from the stub when the bus line is loaded with Zo at both sides of the coupler.

Environmental characteristics

PARAMETERS	REQUIRED	ACTUAL
Operating temperature	-	-65°C to +150°C
Out-gassing	SP-R-0022 - TML < 1% ASTM-E-595 - CVCM < 0.1% ECSS-Q-ST-70-02	TML = 0.0005% RML = 0000027% CVCM = 0%
Off-gassing	NHB 8060.1 Test 7 ECSS-Q-ST-70-29	T = 0.00024 for 65 m^3 volume per coupler* MLW (#) = 2112 for 65 m^3 volume*
MTBF according to MIL HDBK-217	-	1.87 x 10^7 hrs at 25°C and Space Flight environment

Out and Off-gassing results, flammability available for all materials used.
* Typical values obtained by AMB/S-C1 coupler during qualification phase.

Mechanical characteristics

PARAMETERS	REQUIRED	ACTUAL
Weight	-	≤ 27 g
Life test	-	1000 hrs at 120°C
Shocks	-	15 *g*'s in all directions
Acceleration		20 *g*'s in all directions
Random vibrations	MIL-STD-810, Method 514.5	Fonctional at 120°C = 16.35 *g* RMS Endurance at 20°C = 33.23 *g* RMS

Other mechanical and environmental tests available on request.

Transformer characteristics

PARAMETERS	REQUIRED VALUES (MIL-STD-1553B or SAE AS-4115)	NOMINAL VALUE OR AXON' REQUIRED VALUE	
		NOMINAL VALUE	REQUIRED BY AXON' / QUALITY PLAN
The Curie point	-	-	Over 195°C
Turn ratio	√2 ±3%	√2 ±3%	√2 ±3%
Secondary DC resistance	Rs < 5 Ω	Rs = 2 Ω	Rs < 2.5 Ω
Insulation resistance (winding to winding)	Ri > 100 MΩ	-	Ri > 1 000 MΩ with a 250 VDC test voltage
Transformer open circuit impedance	IZI > 3 kΩ on full temperature operating range	IZI > 10 kΩ at 25°C IZI > 4.8 kΩ at -65°C IZI > 4 kΩ at -85°C	IZI > 9.4 kΩ at 25°C***
Primary parallel inductance	-	22 mH	> 20 mH
Primary parallel capacitance	-	10 pF	< 11.4 pF
Inter-winding capacitance	-	45 pF	-
Primary leakage inductance	-	-	< 6.0 µH
Droop*	< 20%	4.5%**	< 20%**
Overshoot and ringing*	±1 V	0.30 V**	< ±1 V**

* Tested with a 250 kHz square waveform of 27 VPP with 100 ns rise and fall times through a 360 ±5% Ω resistor.
** Average values taken during the JN1081N qualification.
*** 9.4 kΩ at 25°C guarantees 3 kΩ from -65°C to +150°C

4 way in-line coupler

SPECIFICATIONS

Microcoupler
MIL-STD-1553B (STANAG 3838)
SSQ 21676 (NASA-BOEING)
PID (CNES), SPE-J-403-A-0070

Testing
AS-SAE-4115

Resistor
MIL-R-39007

Solder
ECSS-Q-ST-70-08,
MIL-STD-2000, NHB 5300.4.

Derating
ECSS-Q-ST-30-11

Potting material
ECSS-Q-ST-70-02, ASTM E595,
and ECSS-Q-ST-70-29
or NHB 8060.1.

Connector assemblies
ECSS-Q-ST-70-26
or NHB 5300.4.

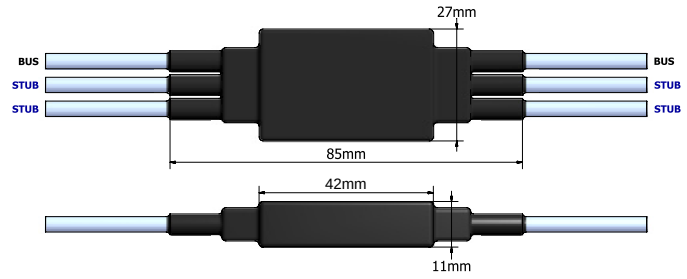
Transformer
JN1081 approved
DDP-J-403-A-022
ESA approved
(COF-BCS-PAD01)

All processes, materials
and components are
approved by CNES
(see CNES-PID-02-AXON')
and BOEING/NASA.

ESA: European Space Agency
CNES: French Space Agency
PID: Part Identification Document

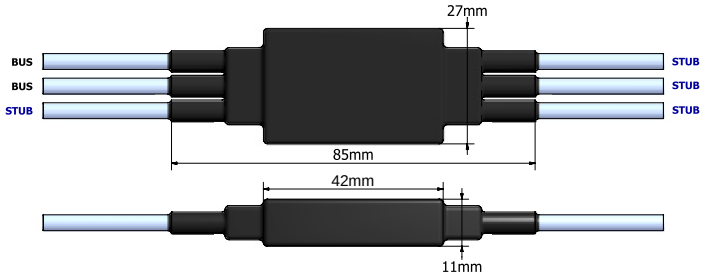
AMB / S - C4 - XX

Version with bus lines on opposite sides of the coupler.



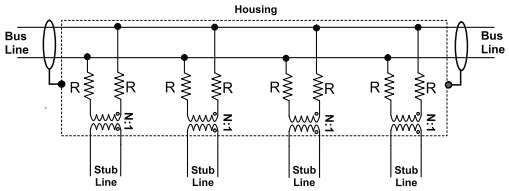
AMB / S - C41 - XX

Version with bus lines on same side of the coupler.



Electrical scheme

N = 1.41 ±3%
R = fault protection resistance
R = 0.75 Zo = 57.6 Ω ±1%



Identification code

AMB /	S	CX	XX
AXON' MICROBUS (see complete reference of the coupler on Bus Standard sheet, page E-4).	**S: SPACE VERSION**	**4: 4 WAY IN-LINE COUPLER** Version with bus lines on opposite sides of the coupler. **41: 4 WAY IN-LINE COUPLER** Version with bus lines on same side of the coupler.	CABLE REFERENCES **40: TWINAX BUS AWG 24 SB** (single braid) acc. to SSQ 21655 (NASA qualified). **41: TWINAX BUS AWG 24 DB** (double braid). **43: TWINAX BUS AWG 26 SB** (single braid). **44: TWINAX BUS AWG 26 DB** (double braid). **45: TWINAX BUS AWG 22 SB** (single braid) acc. to SSQ 21655 (NASA qualified). **80: TWINAX BUS AWG 24 SB** (single braid) according to ESCC 3902.002.20.

NOTE: CABLE LENGTH AND CABLE COLOUR TO BE DEFINED WHEN ORDERING (possibility to differentiate bus and stub cable with a striped colour tape under the transparent jacket or the extrusion of a colour jacket).
See page E-22 for couplers with integrated terminator(s).

Electrical characteristics

PARAMETERS	REQUIRED	ACTUAL
Nominal line impedance*	70 to 84 Ω	77 Ω
Turn ratio	1.41 ±3%	1.41 ±3%
CMR	< -45 dB at 1 MHz	< -50 dB at 1 MHz
Input impedance	> 750 Ω in the frequency range (75 kHz to 1 MHz) and in the indicated temp. range (-65°C to 150°C)	> 750 Ω
Fault protection insulation resistors in series on each bus winding connection	0.75 Zo ±2%	57.6 Ω ±1%
Insulation resistance between: - bus / stub - inner wires / shield	 100 MΩ 100 MΩ	 > 1 000 MΩ at 250 VDC > 1 000 MΩ at 500 VDC
Transfer impedance	-	plot available
Shield continuity	-	10 mΩ maximum
Shield coverage	Cable 90% Connection 75%	Cable 90% minimum Connection 100%
Dielectric withstanding strength: - between shield and inner wires - between outer insulation and shield	 - -	 500 VRMS 500 VRMS

* Impedance: seen from the stub when the bus line is loaded with Zo at both sides of the coupler.

Environmental characteristics

PARAMETERS	REQUIRED	ACTUAL
Operating temperature	-	-65°C to +150°C
Out-gassing	SP-R-0022 - TML < 1% ASTM-E-595 - CVCM < 0.1% ECSS-Q-ST-70-02	TML = 0.0005% RML = 0000027% CVCM = 0%
Off-gassing	NHB 8060.1 Test 7 ECSS-Q-ST-70-29	T = 0.00024 for 65 m^3 volume per coupler* MLW (#) = 2112 for 65 m^3 volume*
MTBF according to MIL HDBK-217	-	1.41 x 10^7 hrs at 25°C and Space Flight environment

Out and Off-gassing results, flammability available for all materials used.
* Typical values obtained by AMB/S-C1 coupler during qualification phase.

Mechanical characteristics

PARAMETERS	REQUIRED	ACTUAL
Weight	-	≤ 25 g
Life test	-	1000 hrs at 120°C
Shocks	-	15 *g*'s in all directions
Acceleration		20 *g*'s in all directions
Random vibrations	MIL-STD-810, Method 514.5	Fonctional at 120°C = 16.35 *g* RMS Endurance at 20°C = 33.23 *g* RMS

Other mechanical and environmental tests available on request.

Transformer characteristics

PARAMETERS	REQUIRED VALUES (MIL-STD-1553B or SAE AS-4115)	NOMINAL VALUE OR AXON' REQUIRED VALUE		
		NOMINAL VALUE		REQUIRED BY AXON' / QUALITY PLAN
The Curie point	-	-		Over 195°C
Turn ratio	√2 ±3%	√2 ±3%		√2 ±3%
Secondary DC resistance	Rs < 5 Ω	Rs = 2 Ω		Rs < 2.5 Ω
Insulation resistance (winding to winding)	Ri > 100 MΩ	-		Ri > 1 000 MΩ with a 250 VDC test voltage
Transformer open circuit impedance	IZI > 3 kΩ on full temperature operating range	IZI > 10 kΩ at 25°C IZI > 4.8 kΩ at -65°C	IZI > 4 kΩ at -85°C	IZI > 9.4 kΩ at 25°C***
Primary parallel inductance	-	22 mH		> 20 mH
Primary parallel capacitance	-	10 pF		< 11.4 pF
Inter-winding capacitance	-	45 pF		-
Primary leakage inductance	-	-		< 6.0 µH
Droop*	< 20%	4.5%**		< 20%**
Overshoot and ringing*	±1 V	0.30 V**		< ±1 V**

* Tested with a 250 kHz square waveform of 27 VPP with 100 ns rise and fall times through a 360 ±5% Ω resistor.
** Average values taken during the JN1081N qualification.
*** 9.4 kΩ at 25°C guarantees 3 kΩ from -65°C to +150°C

4 way in-line coupler with terminator

SPECIFICATIONS

Microcoupler
MIL-STD-1553B (STANAG 3838)
SSQ 21676 (NASA-BOEING)
PID (CNES), SPE-J-403-A-0070

Testing
AS-SAE-4115

Resistor
MIL-R-39007

Solder
ECSS-Q-ST-70-08,
MIL-STD-2000, NHB 5300.4.

Derating
ECSS-Q-ST-30-11

Potting material
ECSS-Q-ST-70-02, ASTM E595,
and ECSS-Q-ST-70-29
or NHB 8060.1.

Connector assemblies
ECSS-Q-ST-70-26
or NHB 5300.4.

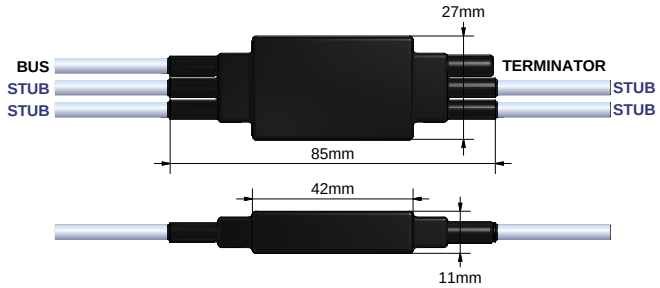
Transformer
JN1081 approved
DDP-J-403-A-022
ESA approved
(COF-BCS-PAD01)

All processes, materials
and components are
approved by CNES
(see CNES-PID-02-AXON')
and BOEING/NASA.

ESA: European Space Agency
CNES: French Space Agency
PID: Part Identification Document

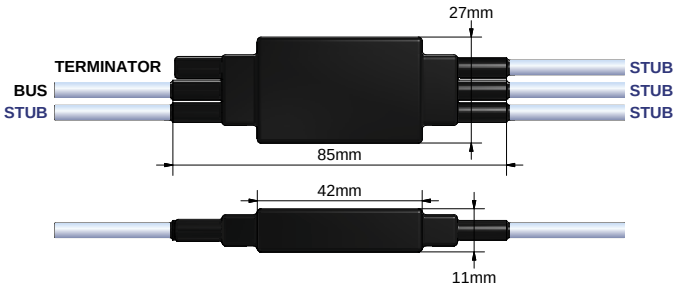
AMB / S - C4 - XX - T RIGHT 'TR'

Version with bus lines on opposite sides of the coupler.



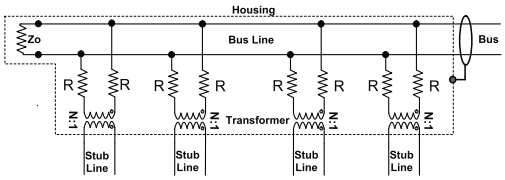
AMB / S - C41 - XX - T LEFT 'TL'

Version with bus lines on same side of the coupler.



Electrical scheme

N = 1.41 ±3%
R = fault protection resistance
R = 0.75 Zo = 57.6 Ω ±1%



Identification code

AMB /	S	CX	XX	TX
AXON' MICROBUS (see complete reference of the coupler on Bus Standard sheet, page E-4).	**S: SPACE VERSION**	**4: 4 WAY IN-LINE COUPLER** Version with bus lines on opposite sides of the coupler. **41: 4 WAY IN-LINE COUPLER** Version with bus lines on same side of the coupler.	CABLE REFERENCES **40: TWINAX BUS AWG 24 SB** (single braid) acc. to SSQ 21655 (NASA qualified). **41: TWINAX BUS AWG 24 DB** (double braid). **43: TWINAX BUS AWG 26 SB** (single braid). **44: TWINAX BUS AWG 26 DB** (double braid). **45: TWINAX BUS AWG 22 SB** (single braid) acc. to SSQ 21655 (NASA qualified). **80: TWINAX BUS AWG 24 SB** (single braid) according to ESCC 3902.002.20.	**TR: T RIGHT** Bus and stub on opposite sides. **TL: T LEFT** Bus and stub on same side of the coupler.

NOTE: CABLE LENGTH AND CABLE COLOUR TO BE DEFINED WHEN ORDERING (possibility to differentiate bus and stub cable with a striped colour tape under the transparent jacket or the extrusion of a colour jacket).
See page E-20 for couplers without integrated terminator(s).

Electrical characteristics

PARAMETERS	REQUIRED	ACTUAL
Nominal line impedance*	70 to 84 Ω	77 Ω
Turn ratio	1.41 ±3%	1.41 ±3%
CMR	< -45 dB at 1 MHz	< -50 dB at 1 MHz
Terminator impedance	77 Ω ±2%	77 Ω ±1%
Fault protection insulation resistors in series on each bus winding connection	0.75 Zo ±2%	57.6 Ω ±1%
Insulation resistance between: - bus / stub - inner wires / shield	 100 MΩ 100 MΩ	 > 1 000 MΩ at 250 VDC > 1 000 MΩ at 500 VDC
Transfer impedance	-	plot available
Shield continuity	-	10 mΩ maximum
Shield coverage	Cable 90% Connection 75%	Cable 90% minimum Connection 100%
Dielectric withstanding strength: - between shield and inner wires - between outer insulation and shield	 - -	 500 VRMS 500 VRMS

* Impedance: seen from the stub when the bus line is loaded with Zo at both sides of the coupler.

Environmental characteristics

PARAMETERS	REQUIRED	ACTUAL
Operating temperature	-	-65°C to +150°C
Out-gassing	SP-R-0022 - TML < 1% ASTM-E-595 - CVCM < 0.1% ECSS-Q-ST-70-02	TML = 0.0005% RML = 0000027% CVCM = 0%
Off-gassing	NHB 8060.1 Test 7 ECSS-Q-ST-70-29	T = 0.00024 for 65 m^3 volume per coupler* MLW (#) = 2112 for 65 m^3 volume*
MTBF according to MIL HDBK-217	-	1.41 x 10^7 hrs at 25°C and Space Flight environment

Out and Off-gassing results, flammability available for all materials used.
* Typical values obtained by AMB/S-C1 coupler during qualification phase.

Mechanical characteristics

PARAMETERS	REQUIRED	ACTUAL
Weight	-	≤ 27 g
Life test	-	1000 hrs at 120°C
Shocks	-	15 *g*'s in all directions
Acceleration		20 *g*'s in all directions
Random vibrations	MIL-STD-810, Method 514.5	Fonctional at 120°C = 16.35 *g* RMS Endurance at 20°C = 33.23 *g* RMS

Other mechanical and environmental tests available on request.

Transformer characteristics

PARAMETERS	REQUIRED VALUES (MIL-STD-1553B or SAE AS-4115)	NOMINAL VALUE OR AXON' REQUIRED VALUE		
		NOMINAL VALUE		REQUIRED BY AXON' / QUALITY PLAN
The Curie point	-	-		Over 195°C
Turn ratio	√2 ±3%	√2 ±3%		√2 ±3%
Secondary DC resistance	Rs < 5 Ω	Rs = 2 Ω		Rs < 2.5 Ω
Insulation resistance (winding to winding)	Ri > 100 MΩ	-		Ri > 1 000 MΩ with a 250 VDC test voltage
Transformer open circuit impedance	IZI > 3 kΩ on full temperature operating range	IZI > 10 kΩ at 25°C IZI > 4.8 kΩ at -65°C	IZI > 4 kΩ at -85°C	IZI > 9.4 kΩ at 25°C***
Primary parallel inductance	-	22 mH		> 20 mH
Primary parallel capacitance	-	10 pF		< 11.4 pF
Inter-winding capacitance	-	45 pF		-
Primary leakage inductance	-	-		< 6.0 µH
Droop*	< 20%	4.5%**		< 20%**
Overshoot and ringing*	±1 V	0.30 V**		< ±1 V**

* Tested with a 250 kHz square waveform of 27 VPP with 100 ns rise and fall times through a 360 ±5% Ω resistor.
** Average values taken during the JN1081N qualification.
*** 9.4 kΩ at 25°C guarantees 3 kΩ from -65°C to +150°C

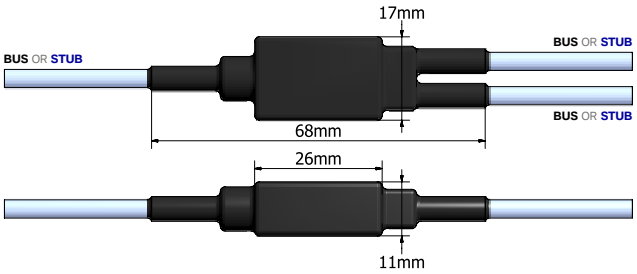
1 way in-line direct coupler

SPECIFICATIONS

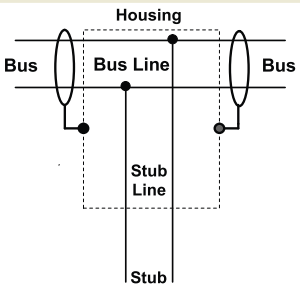
MIL-STD-1553B
STANAG 3838
SAE AS4115

AMBD / S - C1 - XX

Bus and stub can be placed anywhere as long as there are two bus lines and one stub line.



Electrical scheme



Identification code

AMBD /	S	C1	XX
AXON' MICROBUS DIRECT COUPLER	**S : SPACE VERSION**	**1 : 1 WAY IN-LINE DIRECT COUPLER**	CABLE REFERENCES **40: TWINAX BUS AWG 24 SB** (single braid) acc. to SSQ 21655 (NASA qualified). **41: TWINAX BUS AWG 24 DB** (double braid). **43: TWINAX BUS AWG 26 SB** (single braid). **44: TWINAX BUS AWG 26 DB** (double braid). **45: TWINAX BUS AWG 22 SB** (single braid) acc. to SSQ 21655 (NASA qualified). **80: TWINAX BUS AWG 24 SB** (single braid) according to ESCC 3902.002.20.

NOTE: CABLE LENGTH AND CABLE COLOUR TO BE DEFINED WHEN ORDERING (possibility to differentiate bus and stub cable with a striped colour tape under the transparent jacket or the extrusion of a colour jacket).

Electrical characteristics

PARAMETERS	REQUIRED	ACTUAL
Nominal line impedance*	70 to 84 Ω	77 Ω
Turn ratio	1.41 ±3%	1.41 ±3%
CMR	< -45 dB at 1 MHz	< -50 dB at 1 MHz
Input impedance	> 1500 Ω in the frequency range (75 kHz to 1 MHz) and in the indicated temp. range (-65°C to 150°C)	> 1500 Ω
Fault protection insulation resistors in series on each bus winding connection	0.75 Zo ±2%	57.6 Ω ±1%
Stub line bleed off resistor		2 MΩ ±2%
Insulation resistance between: - bus / stub - bus / shield	 100 MΩ 100 MΩ	 > 1 000 MΩ at 250 VDC > 1 000 MΩ at 500 VDC
Transfer impedance	-	plot available
Shield continuity	-	10 mΩ maximum
Shield coverage	Cable 90% Connection 75%	Cable 90% minimum Connection 100%
Dielectric withstanding strength: - between shield and bus line - between outer insulation and shield	 500 VRMS 500 VRMS	 500 VRMS 500 VRMS

* Impedance: seen from the stub when the bus line is loaded with Zo at both sides of the coupler.

Environmental characteristics

PARAMETERS	REQUIRED	ACTUAL
Operating temperature	-	-65°C to +150°C
Out-gassing	SP-R-0022 - TML < 1% ASTM-E-595 - CVCM < 0.1% ECSS-Q-ST-70-02	TML = 0.0005% RML = 0000027% CVCM = 0%
Off-gassing	NHB 8060.1 Test 7 ECSS-Q-ST-70-29	T = 0.00024 for 65 m^3 volume per coupler* MLW (#) = 2112 for 65 m^3 volume*
MTBF according to MIL HDBK-217	-	1.78 x 10^8 at 25°C and Space Flight environment

Out and Off-gassing results, flammability available for all materials used.
* Typical values obtained by AMB/S-C1 coupler during qualification phase.

1 way in-line ESD coupler

SPECIFICATIONS

Microcoupler
MIL-STD-1553B (STANAG 3838)
SSQ 21676 (NASA-BOEING)
PID (CNES), SPE-J-403-A-0070

Testing
AS-SAE-4115

Resistor
MIL-R-39007
MIL-PRF-39017

Solder
ECSS-Q-ST-70-08,
MIL-STD-2000, NHB 5300.4.

Derating
ECSS-Q-ST-30-11

Potting material
ECSS-Q-ST-70-02, ASTM E595,
and ECSS-Q-ST-70-29
or NHB 8060.1.

Connector assemblies
ECSS-Q-ST-70-26
or NHB 5300.4.

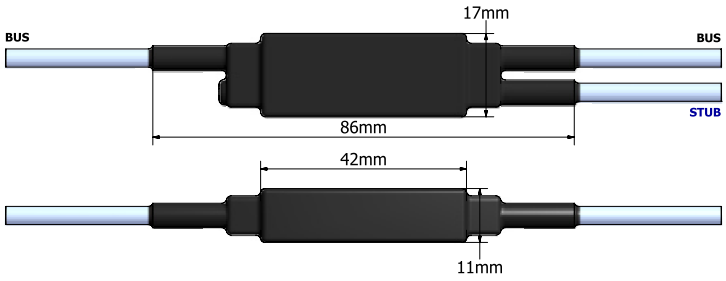
Transformer
JN1081 approved
DDP-J-403-A-022
ESA approved
(COF-BCS-PAD01)

All processes, materials
and components are
approved by CNES
(see CNES-PID-02-AXON')
and BOEING/NASA.

ESA: European Space Agency
CNES: French Space Agency
PID: Part Identification Document

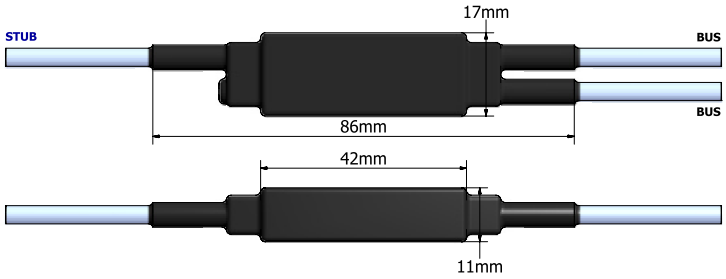
AMB / S - C1 - XX - X ESD

Version with bus lines on opposite sides of the coupler.



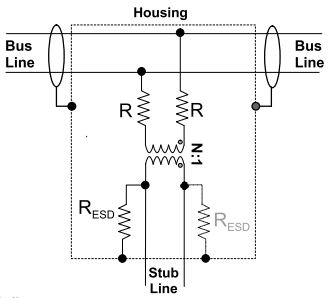
AMB / S - C11 - XX - X ESD

Version with bus lines on same side of the coupler.



Electrical scheme

N = 1.41 ±3%
R = fault protection resistance
R = 0.75 Zo = 57.6 Ω ±1%
R_{ESD} = 2 MΩ



Possibility to have 1 or 2 bleed off resistors of 2 MΩ for each stub line.

Identification code

AMB /	S	CX	XX	X ESD
AXON' MICROBUS	**S: SPACE VERSION**	**1: 1 WAY IN-LINE COUPLER** Version with bus lines on opposite sides of the coupler.	CABLE REFERENCES **40: TWINAX BUS AWG 24 SB** (single braid) according to SSQ 21655 (NASA qualified). **41: TWINAX BUS AWG 24 DB** (double braid). **43: TWINAX BUS AWG 26 SB** (single braid). **44: TWINAX BUS AWG 26 DB** (double braid). **45: TWINAX BUS AWG 22 SB** (single braid) according to SSQ 21655 (NASA qualified). **80: TWINAX BUS AWG 24 SB** (single braid) according to ESCC 3902.002.20.	**1:** One bleed off resistor for each stub line. **2:** Two bleed off resistors for each stub line.

NOTE: CABLE LENGTH AND CABLE COLOUR TO BE DEFINED WHEN ORDERING (possibility to differentiate bus and stub cable with a striped colour tape under the transparent jacket or the extrusion of a colour jacket).

Electrical characteristics

PARAMETERS	REQUIRED	ACTUAL
Nominal line impedance*	70 to 84 Ω	77 Ω
Turn ratio	1.41 ±3%	1.41 ±3%
CMR	< -45 dB at 1 MHz	< -50 dB at 1 MHz
Input impedance	> 3000 Ω in the frequency range (75 kHz to 1 MHz) and in the indicated temp. range (-65°C to 150°C)	> 3000 Ω
Fault protection insulation resistors in series on each bus winding connection	0.75 Zo ±2%	57.6 Ω ±1%
Stub line bleed off resistor		2 MΩ ±2%
Insulation resistance between: - bus / stub - bus / shield	 100 MΩ 100 MΩ	 > 1 000 MΩ at 250 VDC > 1 000 MΩ at 500 VDC
Transfer impedance	-	plot available
Shield continuity	-	10 mΩ maximum
Shield coverage	Cable 90% Connection 75%	Cable 90% minimum Connection 100%
Dielectric withstanding strength: - between shield and bus line - between outer insulation and shield	 500 VRMS 500 VRMS	 500 VRMS 500 VRMS

* Impedance: seen from the stub when the bus line is loaded with Zo at both sides of the coupler.

Environmental characteristics

PARAMETERS	REQUIRED	ACTUAL
Operating temperature	-	-65°C to +150°C
Out-gassing	SP-R-0022 - TML < 1% ASTM-E-595 - CVCM < 0.1% ECSS-Q-ST-70-02	TML = 0.0005% RML = 0000027% CVCM = 0%
Off-gassing	NHB 8060.1 Test 7 ECSS-Q-ST-70-29	T = 0.00024 for 65 m^3 volume per coupler* MLW (#) = 2112 for 65 m^3 volume*
MTBF according to MIL HDBK-217	-	5.11 x 10^7 hrs at 25°C and Space Flight environment

Out and Off-gassing results, flammability available for all materials used.
* Typical values obtained by AMB/S-C1 coupler during qualification phase.

Mechanical characteristics

PARAMETERS	REQUIRED	ACTUAL
Weight	-	≤ 18 g
Life test	-	1000 hrs at 120°C
Shocks	-	15 *g*'s in all directions
Acceleration		20 *g*'s in all directions
Random vibrations	MIL-STD-810, Method 514.5	Fonctional at 120°C = 16.35 *g* RMS Endurance at 20°C = 33.23 *g* RMS

Other mechanical and environmental tests available on request.

Transformer characteristics

PARAMETERS	REQUIRED VALUES (MIL-STD-1553B or SAE AS-4115)	NOMINAL VALUE OR AXON' REQUIRED VALUE		
		NOMINAL VALUE		REQUIRED BY AXON' / QUALITY PLAN
The Curie point	-	-		Over 195°C
Turn ratio	√2 ±3%	√2 ±3%		√2 ±3%
Secondary DC resistance	Rs < 5 Ω	Rs = 2 Ω		Rs < 2.5 Ω
Insulation resistance (winding to winding)	Ri > 100 MΩ	-		Ri > 1 000 MΩ with a 250 VDC test voltage
Transformer open circuit impedance	IZI > 3 kΩ on full temperature operating range	IZI > 10 kΩ at 25°C IZI > 4.8 kΩ at -65°C	IZI > 4 kΩ at -85°C	IZI > 9.4 kΩ at 25°C***
Primary parallel inductance	-	22 mH		> 20 mH
Primary parallel capacitance	-	10 pF		< 11.4 pF
Inter-winding capacitance	-	45 pF		-
Primary leakage inductance	-	-		< 6.0 µH
Droop*	< 20%	4.5%**		< 20%**
Overshoot and ringing*	±1 V	0.30 V**		< ±1 V**

* Tested with a 250 kHz square waveform of 27 VPP with 100 ns rise and fall times through a 360 ±5% Ω resistor.
** Average values taken during the JN1081N qualification.
*** 9.4 kΩ at 25°C guarantees 3 kΩ from -65°C to +150°C

2 way in-line ESD coupler

SPECIFICATIONS

Microcoupler
MIL-STD-1553B (STANAG 3838)
SSQ 21676 (NASA-BOEING)
PID (CNES), SPE-J-403-A-0070

Testing
AS-SAE-4115

Resistor
MIL-R-39007
MIL-PRF-39017

Solder
ECSS-Q-ST-70-08,
MIL-STD-2000, NHB 5300.4.

Derating
ECSS-Q-ST-30-11

Potting material
ECSS-Q-ST-70-02, ASTM E595,
and ECSS-Q-ST-70-29
or NHB 8060.1.

Connector assemblies
ECSS-Q-ST-70-26
or NHB 5300.4.

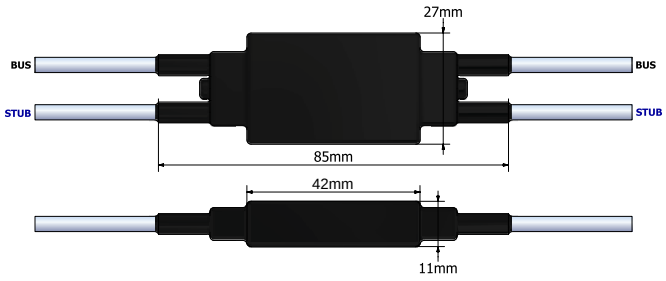
Transformer
JN1081 approved
DDP-J-403-A-022
ESA approved
(COF-BCS-PAD01)

All processes, materials
and components are
approved by CNES
(see CNES-PID-02-AXON')
and BOEING/NASA.

ESA: European Space Agency
CNES: French Space Agency
PID: Part Identification Document

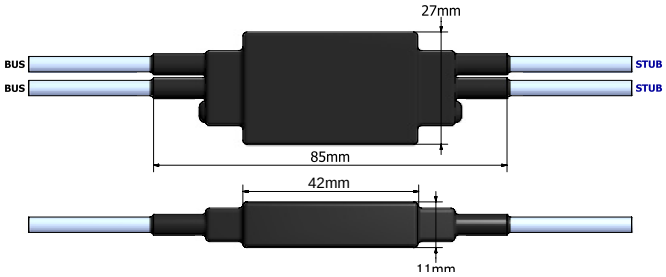
AMB / S - C2 - XX - X ESD

Version with bus lines on opposite sides of the coupler.



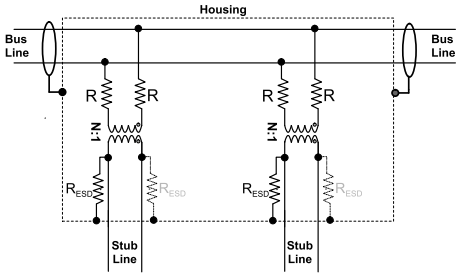
AMB / S - C21 - XX - X ESD

Version with bus lines on same side of the coupler.



Electrical scheme

N = 1.41 ±3%
R = fault protection resistance
R = 0.75 Zo = 57.6 Ω ±1%
R_{ESD} = 2 MΩ



Possibility to have 1 or 2 bleed off resistors of 2 MΩ for each stub line.

Identification code

AMB /	S	CX	XX	X ESD
AXON' MICROBUS	**S: SPACE VERSION**	**2: 2 WAY IN-LINE COUPLER** Version with bus lines on opposite sides of the coupler.	CABLE REFERENCES **40: TWINAX BUS AWG 24 SB** (single braid) according to SSQ 21655 (NASA qualified). **41: TWINAX BUS AWG 24 DB** (double braid). **43: TWINAX BUS AWG 26 SB** (single braid). **44: TWINAX BUS AWG 26 DB** (double braid). **45: TWINAX BUS AWG 22 SB** (single braid) according to SSQ 21655 (NASA qualified). **80: TWINAX BUS AWG 24 SB** (single braid) according to ESCC 3902.002.20.	**1:** One bleed off resistor for each stub line. **2:** Two bleed off resistors for each stub line.

NOTE: CABLE LENGTH AND CABLE COLOUR TO BE DEFINED WHEN ORDERING (possibility to differentiate bus and stub cable with a striped colour tape under the transparent jacket or the extrusion of a colour jacket).

Electrical characteristics

PARAMETERS	REQUIRED	ACTUAL
Nominal line impedance*	70 to 84 Ω	77 Ω
Turn ratio	1.41 ±3%	1.41 ±3%
CMR	< -45 dB at 1 MHz	< -50 dB at 1 MHz
Input impedance	> 1500 Ω in the frequency range (75 kHz to 1 MHz) and in the indicated temp. range (-65°C to 150°C)	> 1500 Ω
Fault protection insulation resistors in series on each bus winding connection	0.75 Zo ±2%	57.6 Ω ±1%
Stub line bleed off resistor		2 MΩ ±2%
Insulation resistance between: - bus / stub - bus / shield	 100 MΩ 100 MΩ	 > 1 000 MΩ at 250 VDC > 1 000 MΩ at 500 VDC
Transfer impedance	-	plot available
Shield continuity	-	10 mΩ maximum
Shield coverage	Cable 90% Connection 75%	Cable 90% minimum Connection 100%
Dielectric withstanding strength: - between shield and bus line - between outer insulation and shield	 500 VRMS 500 VRMS	 500 VRMS 500 VRMS

* Impedance: seen from the stub when the bus line is loaded with Zo at both sides of the coupler.

Environmental characteristics

PARAMETERS	REQUIRED	ACTUAL
Operating temperature	-	-65°C to +150°C
Out-gassing	SP-R-0022 - TML < 1% ASTM-E-595 - CVCM < 0.1% ECSS-Q-ST-70-02	TML = 0.0005% RML = 0000027% CVCM = 0%
Off-gassing	NHB 8060.1 Test 7 ECSS-Q-ST-70-29	T = 0.00024 for 65 m^3 volume per coupler* MLW (#) = 2112 for 65 m^3 volume*
MTBF according to MIL HDBK-217	-	2.17 x 10^7 hrs at 25°C and Space Flight environment

Out and Off-gassing results, flammability available for all materials used.
* Typical values obtained by AMB/S-C1 coupler during qualification phase.

Mechanical characteristics

PARAMETERS	REQUIRED	ACTUAL
Weight	-	≤ 27 g
Life test	-	1000 hrs at 120°C
Shocks	-	15 *g*'s in all directions
Acceleration		20 *g*'s in all directions
Random vibrations	MIL-STD-810, Method 514.5	Fonctional at 120°C = 16.35 *g* RMS Endurance at 20°C = 33.23 *g* RMS

Other mechanical and environmental tests available on request.

Transformer characteristics

PARAMETERS	REQUIRED VALUES (MIL-STD-1553B or SAE AS-4115)	NOMINAL VALUE OR AXON' REQUIRED VALUE		
		NOMINAL VALUE		REQUIRED BY AXON' / QUALITY PLAN
The Curie point	-	-		Over 195°C
Turn ratio	√2 ±3%	√2 ±3%		√2 ±3%
Secondary DC resistance	Rs < 5 Ω	Rs = 2 Ω		Rs < 2.5 Ω
Insulation resistance (winding to winding)	Ri > 100 MΩ	-		Ri > 1 000 MΩ with a 250 VDC test voltage
Transformer open circuit impedance	IZI > 3 kΩ on full temperature operating range	IZI > 10 kΩ at 25°C IZI > 4.8 kΩ at -65°C	IZI > 4 kΩ at -85°C	IZI > 9.4 kΩ at 25°C***
Primary parallel inductance	-	22 mH		> 20 mH
Primary parallel capacitance	-	10 pF		< 11.4 pF
Inter-winding capacitance	-	45 pF		-
Primary leakage inductance	-	-		< 6.0 µH
Droop*	< 20%	4.5%**		< 20%**
Overshoot and ringing*	±1 V	0.30 V**		< ±1 V**

* Tested with a 250 kHz square waveform of 27 VPP with 100 ns rise and fall times through a 360 ±5% Ω resistor.
** Average values taken during the JN1081N qualification.
*** 9.4 kΩ at 25°C guarantees 3 kΩ from -65°C to +150°C

3 way in-line ESD coupler

SPECIFICATIONS

Microcoupler
MIL-STD-1553B (STANAG 3838)
SSQ 21676 (NASA-BOEING)
PID (CNES), SPE-J-403-A-0070

Testing
AS-SAE-4115

Resistor
MIL-R-39007
MIL-PRF-39017

Solder
ECSS-Q-ST-70-08,
MIL-STD-2000, NHB 5300.4.

Derating
ECSS-Q-ST-30-11

Potting material
ECSS-Q-ST-70-02, ASTM E595,
and ECSS-Q-ST-70-29
or NHB 8060.1.

Connector assemblies
ECSS-Q-ST-70-26
or NHB 5300.4.

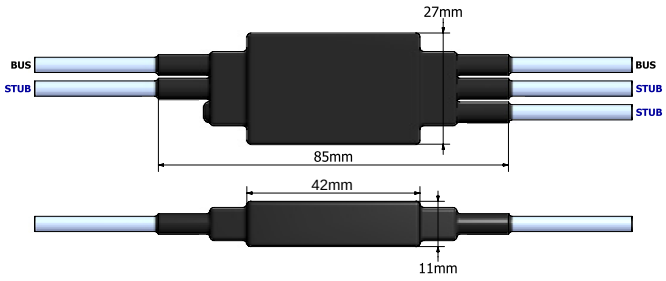
Transformer
JN1081 approved
DDP-J-403-A-022
ESA approved
(COF-BCS-PAD01)

All processes, materials
and components are
approved by CNES
(see CNES-PID-02-AXON')
and BOEING/NASA.

ESA: European Space Agency
CNES: French Space Agency
PID: Part Identification Document

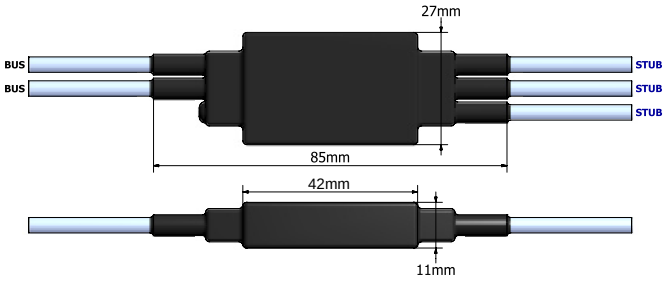
AMB / S - C3 - XX - 1ESD

Version with bus lines on opposite sides of the coupler.



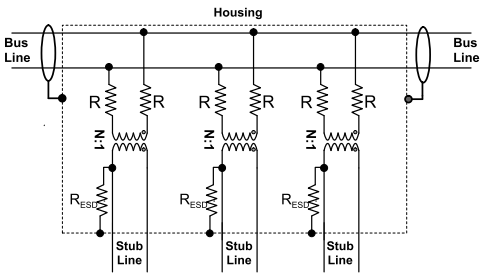
AMB / S - C31 - XX - 1ESD

Version with bus lines on same side of the coupler.



Electrical scheme

N = 1.41 ±3%
R = fault protection resistance
R = 0.75 Zo = 57.6 Ω ±1%
R_{ESD} = 2 MΩ



Possibility to have only 1 bleed off resistor of 2 MΩ for each stub line.

Identification code

AMB /	S	CX	XX	1ESD
AXON' MICROBUS	**S: SPACE VERSION**	**3: 3 WAY IN-LINE COUPLER** Version with bus lines on opposite sides of the coupler.	CABLE REFERENCES **40: TWINAX BUS AWG 24 SB** (single braid) according to SSQ 21655 (NASA qualified). **41: TWINAX BUS AWG 24 DB** (double braid). **43: TWINAX BUS AWG 26 SB** (single braid). **44: TWINAX BUS AWG 26 DB** (double braid). **45: TWINAX BUS AWG 22 SB** (single braid) according to SSQ 21655 (NASA qualified). **80: TWINAX BUS AWG 24 SB** (single braid) according to ESCC 3902.002.20.	**1:** One bleed off resistor for each stub line

NOTE: CABLE LENGTH AND CABLE COLOUR TO BE DEFINED WHEN ORDERING (possibility to differentiate bus and stub cable with a striped colour tape under the transparent jacket or the extrusion of a colour jacket).

Electrical characteristics

PARAMETERS	REQUIRED	ACTUAL
Nominal line impedance*	70 to 84 Ω	77 Ω
Turn ratio	1.41 ±3%	1.41 ±3%
CMR	< -45 dB at 1 MHz	< -50 dB at 1 MHz
Input impedance	> 1000 Ω in the frequency range (75 kHz to 1 MHz) and in the indicated temp. range (-65°C to 150°C)	> 1000 Ω
Fault protection insulation resistors in series on each bus winding connection	0.75 Zo ±2%	57.6 Ω ±1%
Stub line bleed off resistor		2 MΩ ±2%
Insulation resistance between: - bus / stub - bus / shield	 100 MΩ 100 MΩ	 > 1 000 MΩ at 250 VDC > 1 000 MΩ at 500 VDC
Transfer impedance	-	plot available
Shield continuity	-	10 mΩ maximum
Shield coverage	Cable 90% Connection 75%	Cable 90% minimum Connection 100%
Dielectric withstanding strength: - between shield and bus line - between outer insulation and shield	 500 VRMS 500 VRMS	 500 VRMS 500 VRMS

* Impedance: seen from the stub when the bus line is loaded with Zo at both sides of the coupler.

Environmental characteristics

PARAMETERS	REQUIRED	ACTUAL
Operating temperature	-	-65°C to +150°C
Out-gassing	SP-R-0022 - TML < 1% ASTM-E-595 - CVCM < 0.1% ECSS-Q-ST-70-02	TML = 0.0005% RML = 0000027% CVCM = 0%
Off-gassing	NHB 8060.1 Test 7 ECSS-Q-ST-70-29	T = 0.00024 for 65 m^3 volume per coupler* MLW (#) = 2112 for 65 m^3 volume*
MTBF according to MIL HDBK-217	-	1.87 x 10^7 hrs at 25°C and Space Flight environment

Out and Off-gassing results, flammability available for all materials used.
* Typical values obtained by AMB/S-C1 coupler during qualification phase.

Mechanical characteristics

PARAMETERS	REQUIRED	ACTUAL
Weight	-	≤ 27 g
Life test	-	1000 hrs at 120°C
Shocks	-	15 *g*'s in all directions
Acceleration		20 *g*'s in all directions
Random vibrations	MIL-STD-810, Method 514.5	Fonctional at 120°C = 16.35 *g* RMS Endurance at 20°C = 33.23 *g* RMS

Other mechanical and environmental tests available on request.

Transformer characteristics

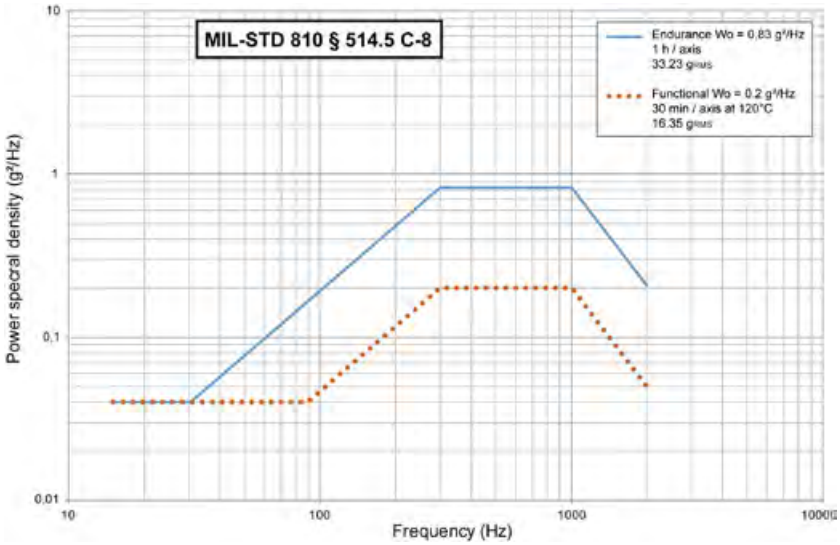
PARAMETERS	REQUIRED VALUES (MIL-STD-1553B or SAE AS-4115)	NOMINAL VALUE OR AXON' REQUIRED VALUE		
		NOMINAL VALUE		REQUIRED BY AXON' / QUALITY PLAN
The Curie point	-	-		Over 195°C
Turn ratio	√2 ±3%	√2 ±3%		√2 ±3%
Secondary DC resistance	Rs < 5 Ω	Rs = 2 Ω		Rs < 2.5 Ω
Insulation resistance (winding to winding)	Ri > 100 MΩ	-		Ri > 1 000 MΩ with a 250 VDC test voltage
Transformer open circuit impedance	IZI > 3 kΩ on full temperature operating range	IZI > 10 kΩ at 25°C IZI > 4.8 kΩ at -65°C	IZI > 4 kΩ at -85°C	IZI > 9.4 kΩ at 25°C***
Primary parallel inductance	-	22 mH		> 20 mH
Primary parallel capacitance	-	10 pF		< 11.4 pF
Inter-winding capacitance	-	45 pF		-
Primary leakage inductance	-	-		< 6.0 µH
Droop*	< 20%	4.5%**		< 20%**
Overshoot and ringing*	±1 V	0.30 V**		< ±1 V**

* Tested with a 250 kHz square waveform of 27 VPP with 100 ns rise and fall times through a 360 ±5% Ω resistor.
** Average values taken during the JN1081N qualification.
*** 9.4 kΩ at 25°C guarantees 3 kΩ from -65°C to +150°C

Detailed AMB technical informations

Random vibration profile

MIL-STD 810



ACB1 databus connectors & contacts

AXON' have developed a triaxial connector called ACB1 (AXON' Connector Bus series 1) suitable for any type of twisted shielded AWG 24 pair cables. The connector is crimped on to cables and assemblies designed and manufactured to MIL-STD-1553.

Advantages

A single crimping tool M22520/5-01 with an AXON' die is required to assemble the connector: no need for two crimp tools, one die and one or two positioning tools like most connectors.

- ACB1 connectors make assembly easier.
- ACB1 connectors reduce the time for mounting.
- No potting is required.
- ACB1 connectors and mating halves can integrate with either pin or socket contacts: the connector is mounted to your needs.
- ACB1 connectors have gone through test sequences defined by the EN3716 standard.
- The only connector approved to ESCC3401/079 by ESA.

Versions

- 2 types of connectors:
  - bulkhead jack series (BK),
  - Plug series (PG).

Please contact us for ACB1 connectors in space rated version.

- For each type of connectors, there are 2 versions available:
  - bayonet (4 keyings),
  - threaded.

ACB1 DATABUS CONNECTOR

Pin and socket contact

for ACB1 connectors

SPECIFICATIONS

MIL-STD-1553B
Digital time division command / response multiplex databus

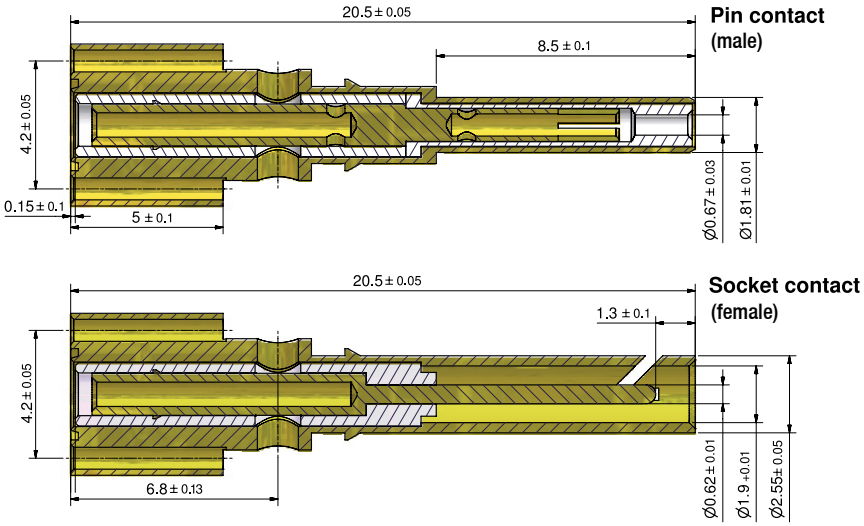
MIL-STD-1344
General environmental tests

ASTM-B-196
Material for contact

MIL-G-45204 Class 1
Surface treatment for contact

ACB1 SERIES

Dimensions are in millimetres



AXON's ACB1 series contact (pin or socket) are designed for databus applications.
This contact is to be crimped on AWG24 databus cable and mounted on ACB1 connectors series.

Identification code

ACB1	SR	X
AXON' CONNECTOR BUS TYPE 1	**SR:** Space Rated.	**TYPE OF CONTACT** **P:** pin contact. **S:** socket contact.

Materials and surface treatment

PARAMETERS	ACTUAL
Socket contact	Copper alloy / gold plating in accordance with MIL-G-45204 CLASS 1 (> 1.27 µm)
Pin contact	Copper alloy / gold plating in accordance with MIL-G-45204 CLASS 1 (> 1.27 µm)
Insulator	PTFE

Electrical characteristics

PARAMETERS	ACTUAL
Insulation resistance between inner and outer contacts (sea level)	5 000 MΩ minimum at 500 V_{DC}
Dielectric withstanding voltage between inner and outer contacts (sea level)	900 V_{RMS} maximum
Contact resistance	8 mΩ maximum

Mechanical and environmental characteristics

PARAMETERS	ACTUAL
Operating temperature	-65°C + 150°C
Socket contact weight	1.5 g maximum
Pin contact weight	1.5 g maximum
Durability (mounting / dismounting)	500 cycles
Sinusoidal vibration	IEC N° 512-4, test 6d, 10-2000 Hz, 20 g
Random vibration	IEC N° 68-2-35, test Fda, 20-2000 Hz, 20 g $_{RMS}$
Shock	IEC N° 512-4, test 6c, half sine pulse, 11 ms, 50 g

Type of cables

PARAMETERS	ACTUAL
Type of cables	All types of AWG 24 twisted shielded pairs with an outer diameter ≤ 3.8 mm

Tooling used for crimping the contact on the cable

TYPE OF CRIMPING	CRIMPING TOOL	DIE
Contact	M 22520/5-01	AX-CD-02 or AX-CD-03 (*)

(*) Depends on the connector version (refers to technical data sheet)
Crimping according to assembly instructions «CON-1553-GF-27»

ACB1 databus connector

STRAIGHT & BAYONET VERSION

SPECIFICATIONS

ESCC 3401
Connectors, electrical, non-filtered circular and rectangular

ESCC 3401 079
Connectors, electrical, triaxial, bayonet coupling, MIL-STD-1553B databus with non-removable crimp contacts

MIL-STD-1553B
Digital time division command / response multiplex databus

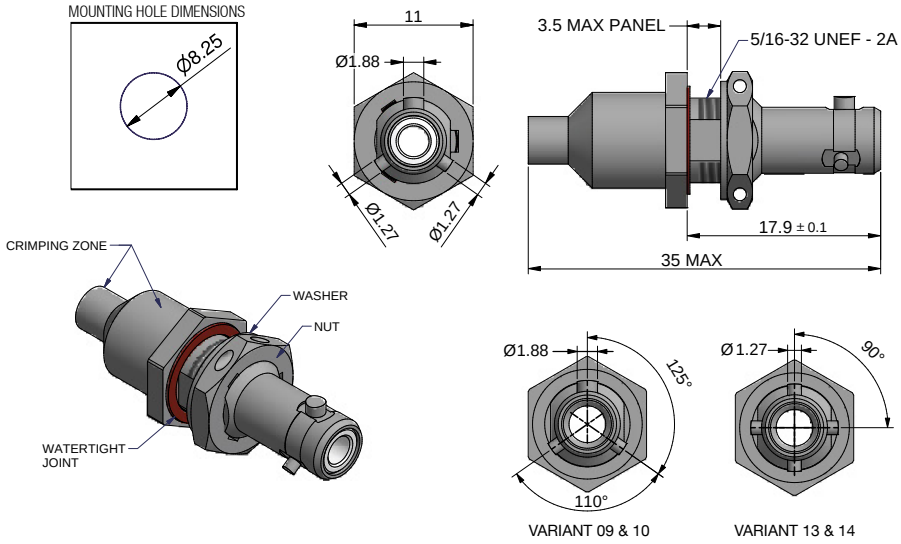
MIL-STD-1344
General environmental tests

ASTM-B-733
or MIL-C-26074
Surface treatment for body and ferrule

MIL-G-45204 Class 1
Surface treatment for contact

ESCC 3401 079 variants 09, 10, 13 & 14

Dimensions are in millimetres



AXON' ACB1 connectors series is specifically designed for MIL-STD-1553 B databus application.
Available in bayonet coupling 3A or 4.
These connectors are to be crimped on AWG 24 databus cables. The bulkhead jacks are designed to be fixed by using a jam nut and a washer.

CHARACTERISTICS

The connector is composed by 4 main pieces:
- 1 ferrule,
- 1 body,
- 1 insulator and
- 1 contact (pin or socket),

and 4 additional pieces:
- 1 nut,
- 1 washer,
- 1 watertight joint and
- 1 heat shrinkable strain relief.

Variant definition

VARIANT	TYPE	REAR	LOCKING	CONTACT	CABLE
ESCC 3401 079 variant 09	bulkhead jack	straight	3 lug bayonet	socket	cable ≤ Ø 3.4 mm
ESCC 3401 079 variant 10	bulkhead jack	straight	3 lug bayonet	socket	Ø 3.4 mm < cable ≤ Ø 3.8 mm
ESCC 3401 079 variant 13	bulkhead jack	straight	4 lug bayonet	socket	cable ≤ Ø 3.4 mm
ESCC 3401 079 variant 14	bulkhead jack	straight	4 lug bayonet	socket	Ø 3.4 mm < cable ≤ Ø 3.8 mm

Materials and surface treatment

PARTS	ACTUAL
Body	Brass / Electroless nickel plating according to ASTM-B-733 (5 ±1 µm)
Socket contact	Copper alloy / gold plating in accordance with MIL-G-45204 CLASS 1 (> 1.27 µm)
Pin contact	Copper alloy / gold plating in accordance with MIL-G-45204 CLASS 1 (> 1.27 µm)
Ferrule	Copper alloy / Electroless nickel plating according to ASTM-B-733 (5 ±1 µm)
Insulator	PTFE
Shrinkable strain relief	VITON®
Watertight joint	Silicon

Electrical characteristics

PARAMETERS	ACTUAL
Contact resistance	8 mΩ maximum
Insulation resistance (sea level)	5 000 MΩ minimum at 500 VDC
Voltage strength (sea level)	900 VRMS maximum
Operating voltage	200 VRMS maximum

Mechanical and environmental characteristics

PARAMETERS	ACTUAL
Operating temperature	-55°C +150°C
Bulkhead jack with ferrule and contact weight	9 g maximum
Thickness panel	3.5 mm maximum
Torque of fixing nut	2.0 ±0.1 N.m
Salt spray	500 hours
Durability (mounting / dismounting)	500 cycles
Sinusoidal vibration	IEC N° 512-4, test 6d, 10-2000 Hz, 20 g
Random vibration	IEC N° 68-2-35, test Fda, 20-2000 Hz, 20 g RMS
Shock	IEC N° 512-4, test 6c, half sine pulse, 11 ms, 50 g

Type of cables

PARAMETERS	ACTUAL
Type of cables	All types of AWG 24 twisted shield pair with an outer diameter ≤ 3.8 mm

Tooling used for crimping the connector on the cable

TYPE OF CONNECTOR	TYPE OF CRIMPING	CRIMPING TOOL	DIE
Straight versions	Contact	M 22520/5-01	AX-CD-02
	Straight ferrule	M 22520/5-01	AX-CD-02

Crimping according to assembly instructions «CON-1553-GF-27»

VITON® IS A REGISTERED TRADEMARK OF DUPONT

ACB1 databus connector

ELBOW & BAYONET VERSION

SPECIFICATIONS

ESCC 3401
Connectors, electrical, non-filtered circular and rectangular

ESCC 3401 079
Connectors, electrical, triaxial, bayonet coupling, MIL-STD-1553B databus with non-removable crimp contacts

MIL-STD-1553B
Digital time division command / response multiplex databus

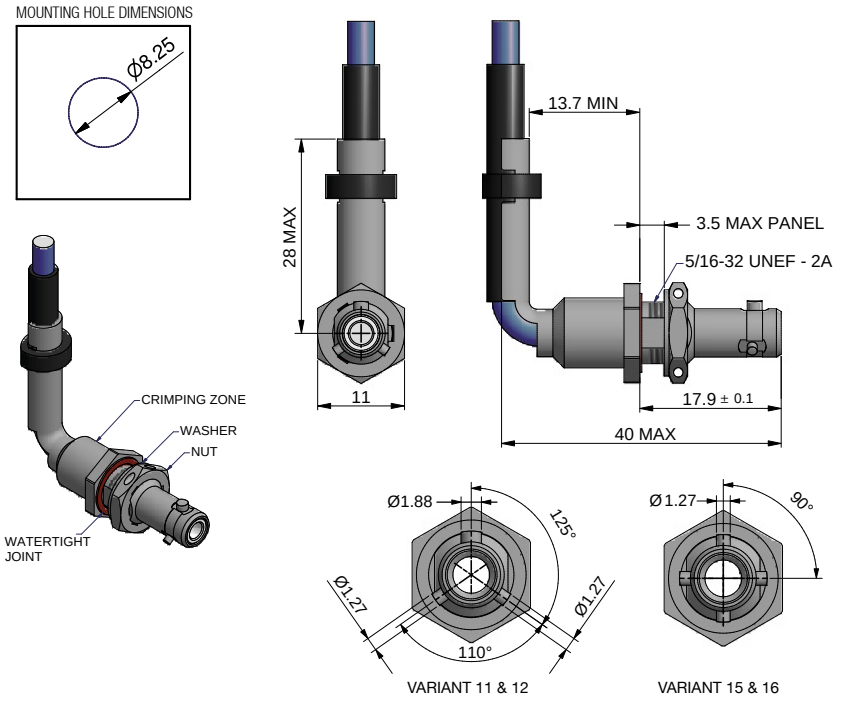
MIL-STD-1344
General environmental tests

ASTM-B-733
or MIL-C-26074
Surface treatment for body and ferrule

MIL-G-45204 Class 1
Surface treatment for contact

ESCC 3401 079 variants 11, 12, 15 & 16

Dimensions are in millimetres



AXON' ACB1 connectors series is specifically designed for MIL-STD-1553 B databus application.
Available in bayonet coupling 3A or 4.
These connectors are to be crimped on AWG 24 databus cables. The bulkhead jacks are designed to be fixed by using a jam nut and a washer.

CHARACTERISTICS

The connector is composed by 4 main pieces:
- 1 ferrule,
- 1 body,
- 1 insulator and
- 1 contact (pin or socket),

and 4 additional pieces:
- 1 nut,
- 1 washer,
- 1 watertight joint and
- 1 heat shrinkable strain relief.

Variant definition

VARIANT	TYPE	REAR	LOCKING	CONTACT	CABLE
ESCC 3401 079 variant 11	bulkhead jack	right angle	3 lug bayonet	socket	cable ≤ Ø 3.4 mm
ESCC 3401 079 variant 12	bulkhead jack	right angle	3 lug bayonet	socket	Ø 3.4 mm < cable ≤ Ø 3.8 mm
ESCC 3401 079 variant 15	bulkhead jack	right angle	4 lug bayonet	socket	cable ≤ Ø 3.4 mm
ESCC 3401 079 variant 16	bulkhead jack	right angle	4 lug bayonet	socket	Ø 3.4 mm < cable ≤ Ø 3.8 mm

Materials and surface treatment

PARTS	ACTUAL
Body	Brass / Electroless nickel plating according to ASTM-B-733 (5 ±1 µm)
Socket contact	Copper alloy / gold plating in accordance with MIL-G-45204 CLASS 1 (> 1.27 µm)
Pin contact	Copper alloy / gold plating in accordance with MIL-G-45204 CLASS 1 (> 1.27 µm)
Ferrule	Copper alloy / Electroless nickel plating according to ASTM-B-733 (5 ±1 µm)
Insulator	PTFE
Shrinkable strain relief	VITON®
Watertight joint	Silicon

Electrical characteristics

PARAMETERS	ACTUAL
Contact resistance	8 mΩ maximum
Insulation resistance (sea level)	5 000 MΩ minimum at 500 VDC
Voltage strength (sea level)	900 VRMS maximum
Operating voltage	200 VRMS maximum

Mechanical and environmental characteristics

PARAMETERS	ACTUAL
Operating temperature	-55°C +150°C
Bulkhead jack with ferrule and contact weight	11.5 g maximum
Thickness panel	3.5 mm maximum
Torque of fixing nut	2.0 ±0.1 N.m
Salt spray	500 hours
Durability (mounting / dismounting)	500 cycles
Sinusoidal vibration	IEC N° 512-4, test 6d, 10-2000 Hz, 20 g
Random vibration	IEC N° 68-2-35, test Fda, 20-2000 Hz, 20 g RMS
Shock	IEC N° 512-4, test 6c, half sine pulse, 11 ms, 50 g

Type of cables

PARAMETERS	ACTUAL
Type of cables	All types of AWG 24 twisted shield pair with an outer diameter ≤ 3.8 mm

Tooling used for crimping the connector on the cable

TYPE OF CONNECTOR	TYPE OF CRIMPING	CRIMPING TOOL	DIE
Swept elbow connectors	Contact	M 22520/5-01	AX-CD-03
	Swept elbow ferrule	M 22520/5-01	AX-CD-03

Crimping according to assembly instructions «CON-1553-GF-27»
A tie-wrap or a lacing lane can be used to maintain the cable onto the ferrule. These items can be provided upon request

VITON® IS A REGISTERED TRADEMARK OF DUPONT

ACB1 databus connector

STRAIGHT & BAYONET VERSION

SPECIFICATIONS

ESCC 3401
Connectors, electrical, non-filtered circular and rectangular

ESCC 3401 079
Connectors, electrical, triaxial, bayonet coupling, MIL-STD-1553B databus with non-removable crimp contacts

MIL-STD-1553B
Digital time division command / response multiplex databus

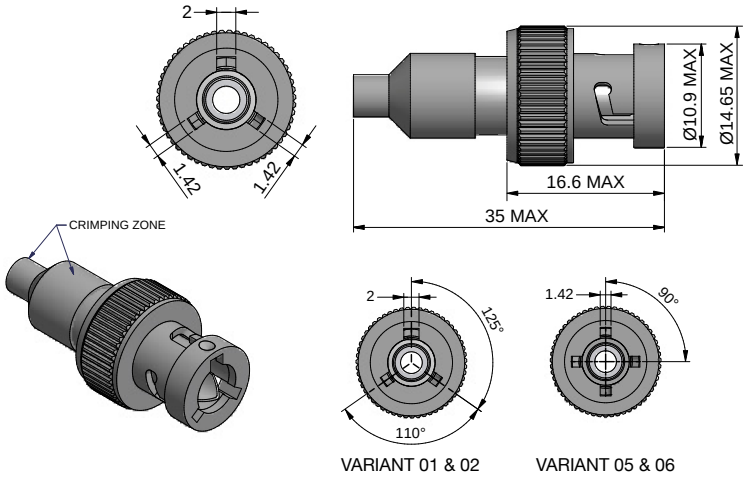
MIL-STD-1344
General environmental tests

ASTM-B-733
or MIL-C-26074
Surface treatment for body and ferrule

MIL-G-45204 Class 1
Surface treatment for contact

ESCC 3401 079 variants 01, 02, 05 & 06

Dimensions are in millimetres



VARIANT 01 & 02 VARIANT 05 & 06

AXON' ACB1 connectors series is specifically designed for MIL-STD-1553 B databus application.
Available in bayonet coupling 3A or 4.
These connectors are to be crimped on AWG 24 databus cables.

CHARACTERISTICS

The connector is composed by 4 main pieces:
- 1 ferrule,
- 1 body,
- 1 insulator and
- 1 contact (pin or socket),

and 1 additional piece:
- 1 heat shrinkable strain relief.

Variant definition

VARIANT	TYPE	REAR	LOCKING	CONTACT	CABLE
ESCC 3401 079 variant 01	plug	straight	3 lug bayonet	pin	cable ≤ Ø 3.4 mm
ESCC 3401 079 variant 02	plug	straight	3 lug bayonet	pin	Ø 3.4 mm < cable ≤ Ø 3.8 mm
ESCC 3401 079 variant 05	plug	straight	4 lug bayonet	pin	cable ≤ Ø 3.4 mm
ESCC 3401 079 variant 06	plug	straight	4 lug bayonet	pin	Ø 3.4 mm < cable ≤ Ø 3.8 mm

Materials and surface treatment

PARTS	ACTUAL
Body	Brass / Electroless nickel plating according to ASTM-B-733 (5 ±1 µm)
Socket contact	Copper alloy / gold plating in accordance with MIL-G-45204 CLASS 1 (> 1.27 µm)
Pin contact	Copper alloy / gold plating in accordance with MIL-G-45204 CLASS 1 (> 1.27 µm)
Ferrule	Copper alloy / Electroless nickel plating according to ASTM-B-733 (5 ±1 µm)
Insulator	PTFE
Shrinkable strain relief	VITON®

Electrical characteristics

PARAMETERS	ACTUAL
Contact resistance	8 mΩ maximum
Insulation resistance (sea level)	5 000 MΩ minimum at 500 VDC
Voltage strength (sea level)	900 VRMS maximum
Operating voltage	200 VRMS maximum

Mechanical and environmental characteristics

PARAMETERS	ACTUAL
Operating temperature	-55°C +150°C
Plug with ferrule and contact weight	14 g maximum
Salt spray	500 hours
Durability (mounting / dismounting)	500 cycles
Sinusoidal vibration	IEC N° 512-4, test 6d, 10-2000 Hz, 20 g
Random vibration	IEC N° 68-2-35, test Fda, 20-2000 Hz, 20 g RMS
Shock	IEC N° 512-4, test 6c, half sine pulse, 11 ms, 50 g

Type of cables

PARAMETERS	ACTUAL
Type of cables	All types of AWG 24 twisted shield pair with an outer diameter ≤ 3.8 mm

Tooling used for crimping the connector on the cable

TYPE OF CONNECTOR	TYPE OF CRIMPING	CRIMPING TOOL	DIE
Straight versions	Contact	M 22520/5-01	AX-CD-02
	Straight ferrule	M 22520/5-01	AX-CD-02

Crimping according to assembly instructions «CON-1553-GF-27»

VITON® IS A REGISTERED TRADEMARK OF DUPONT

ACB1 databus connector

ELBOW & BAYONET VERSION

SPECIFICATIONS

ESCC 3401
Connectors, electrical, non-filtered circular and rectangular

ESCC 3401 079
Connectors, electrical, triaxial, bayonet coupling, MIL-STD-1553B databus with non-removable crimp contacts

MIL-STD-1553B
Digital time division command / response multiplex databus

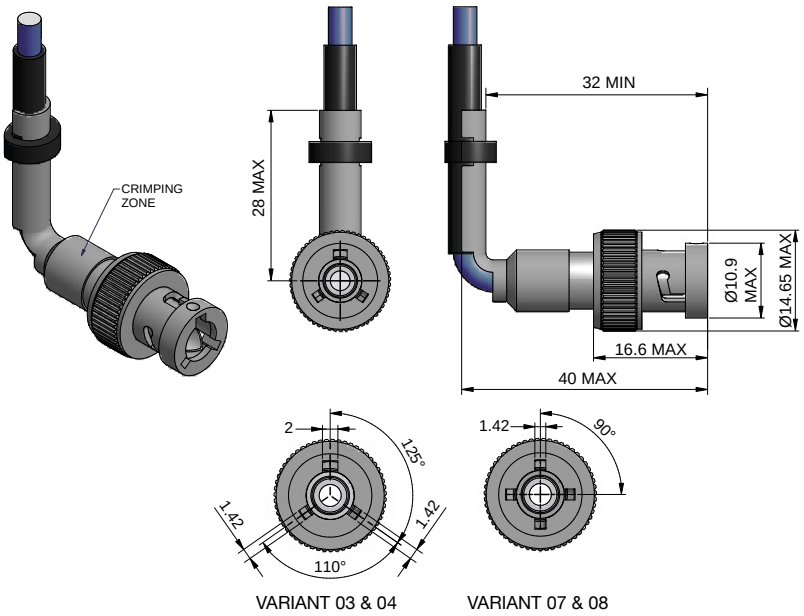
MIL-STD-1344
General environmental tests

ASTM-B-733
or MIL-C-26074
Surface treatment for body and ferrule

MIL-G-45204 Class 1
Surface treatment for contact

ESCC 3401 079 variants 03, 04, 07 & 08

Dimensions are in millimetres



VARIANT 03 & 04 VARIANT 07 & 08

AXON' ACB1 connectors series is specifically designed for MIL-STD-1553 B databus application.
Available in bayonet coupling 3A or 4.
These connectors are to be crimped on AWG 24 databus cables.

CHARACTERISTICS

The connector is composed by 4 main pieces:
- 1 ferrule,
- 1 body,
- 1 insulator and
- 1 contact (pin or socket),

and 1 additional piece:
- 1 heat shrinkable strain relief.

Variant definition

VARIANT	TYPE	REAR	LOCKING	CONTACT	CABLE
ESCC 3401 079 variant 03	plug	right angle	3 lug bayonet	pin	cable ≤ Ø 3.4 mm
ESCC 3401 079 variant 04	plug	right angle	3 lug bayonet	pin	Ø 3.4 mm < cable ≤ Ø 3.8 mm
ESCC 3401 079 variant 07	plug	right angle	4 lug bayonet	pin	cable ≤ Ø 3.4 mm
ESCC 3401 079 variant 08	plug	right angle	4 lug bayonet	pin	Ø 3.4 mm < cable ≤ Ø 3.8 mm

Materials and surface treatment

PARTS	ACTUAL
Body	Brass / electroless nickel plating according to ASTM-B-733 (5 ±1 µm)
Socket contact	Copper alloy / gold plating in accordance with MIL-G-45204 CLASS 1 (> 1.27 µm)
Pin contact	Copper alloy / gold plating in accordance with MIL-G-45204 CLASS 1 (> 1.27 µm)
Ferrule	Copper alloy / electroless nickel plating according to ASTM-B-733 (5 ±1 µm)
Insulator	PTFE
Shrinkable strain relief	VITON®

Electrical characteristics

PARAMETERS	ACTUAL
Contact resistance	8 mΩ maximum
Insulation resistance (sea level)	5 000 MΩ minimum at 500 VDC
Voltage strength (sea level)	900 VRMS maximum
Operating voltage	200 VRMS maximum

Mechanical and environmental characteristics

PARAMETERS	ACTUAL
Operating temperature	-55°C to +150°C
Plug with ferrule and contact weight	16.5 g maximum
Salt spray	500 hours
Durability (mounting / dismounting)	500 cycles
Sinusoidal vibration	IEC N° 512-4, test 6d, 10-2000 Hz, 20 g
Random vibration	IEC N° 68-2-35, test Fda, 20-2000 Hz, 20 g RMS
Shock	IEC N° 512-4, test 6c, half sine pulse, 11 ms, 50 g

Type of cables

PARAMETERS	ACTUAL
Type of cables	All types of AWG 24 twisted shield pair with an outer diameter ≤ 3.8 mm

Tooling used for crimping the connector on the cable

TYPE OF CONNECTOR	TYPE OF CRIMPING	CRIMPING TOOL	DIE
Swept elbow connectors	Contact	M 22520/5-01	AX-CD-03
	Swept elbow ferrule	M 22520/5-01	AX-CD-03

Crimping according to assembly instructions «CON-1553-GF-27»

VITON® IS A REGISTERED TRADEMARK OF DUPONT

ACB1 databus connector

PIGTAIL & BAYONET VERSION

SPECIFICATIONS

ESCC 3401
Connectors, electrical, non-filtered circular and rectangular

ESCC 3401 079
Connectors, electrical, triaxial, bayonet coupling, MIL-STD-1553B databus with non-removable crimp contacts

MIL-STD-1553B
Digital time division command / response multiplex databus

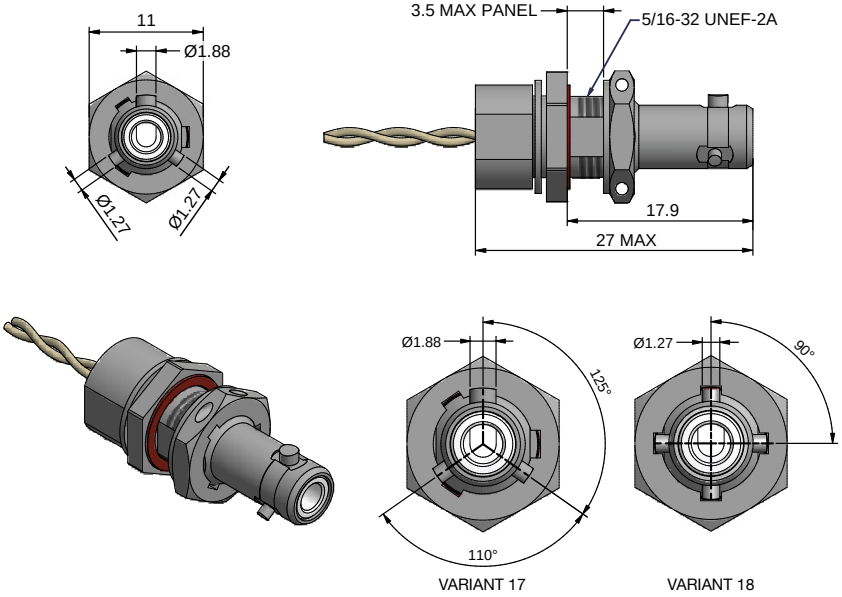
MIL-STD-1344
General environmental tests

ASTM-B-733
or MIL-C-26074
Surface treatment for body and ferrule

MIL-G-45204 Class 1
Surface treatment for contact

ESCC 3401 079 variants 17 & 18

Dimensions are in millimetres



AXON' ACB1 connectors series is specifically designed for MIL-STD-1553 B databus application.
Available in bayonet coupling 3A or 4.

CHARACTERISTICS

The connector is supplied assembled with 30 cm of 24AWG twisted pair cable per ESCC 3901.013 variant 08 or equivalent.

Variant definition

VARIANT	TYPE	REAR	LOCKING	CONTACT
ESCC 3401 079 variant 17	bulkhead jack	pigtail	3 lug bayonet	socket
ESCC 3401 079 variant 18	bulkhead jack	pigtail	4 lug bayonet	socket

Materials and surface treatment

PARTS	ACTUAL
Body	Brass / electroless nickel plating according to ASTM-B-733 (5 ±1 µm)
Socket contact	Copper alloy / gold plating in accordance with MIL-G-45204 CLASS 1 (> 1.27 µm)
Pin contact	Copper alloy / gold plating in accordance with MIL-G-45204 CLASS 1 (> 1.27 µm)
Insulator	PTFE
Watertight joint	Silicon

Electrical characteristics

PARAMETERS	ACTUAL
Contact resistance	8 mΩ maximum
Insulation resistance (sea level)	5 000 MΩ minimum at 500 V_{DC}
Voltage strength (sea level)	900 V_{RMS} maximum
Operating voltage	200 V_{RMS} maximum

Mechanical and environmental characteristics

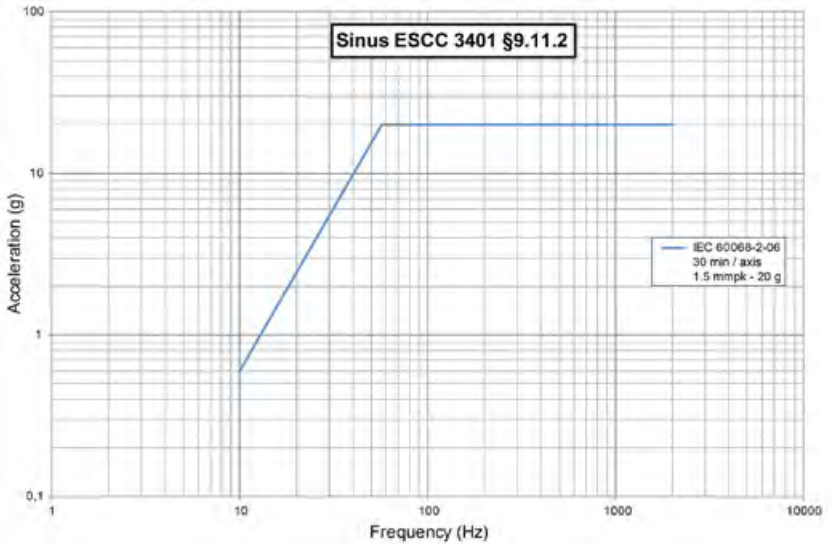
PARAMETERS	ACTUAL
Operating temperature	-55°C to +150°C
Plug with ferrule and contact weight	12 g maximum
Salt spray	500 hours
Durability (mounting / dismounting)	500 cycles
Sinusoidal vibration	IEC N° 512-4, test 6d, 10-2000 Hz, 20 g
Random vibration	IEC N° 68-2-35, test Fda, 20-2000 Hz, 20 g $_{RMS}$
Shock	IEC N° 512-4, test 6c, half sine pulse, 11 ms, 50 g

Detailed ACB1 technical informations

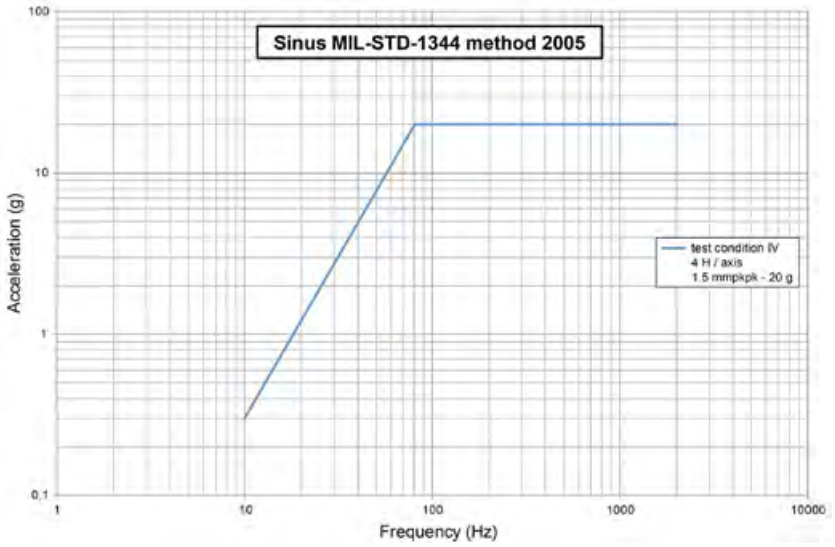
Sinusoidal vibration profiles

ESCC 3401

ESCC3401 vibration profile in accordance with IEC standard.



MIL-STD-1344



Splices & terminators

Splices

Splices are used to interconnect databus systems without connectors or for repair and maintenance. Their advantages are:

- Controlled impedance,
- Good mechanical characteristics,
- Cost-effective solution,
- Installed with standard tooling,
- Lightweight.

Terminators

77 Ω bus terminators used to match the bus line and 3kΩ (or other value on request) terminators used to load a stub line exist in:

- inline version with or without bleed of resistor
- dismountable version on ACB1, D-Sub or other specified connector.

D-SUB DISMOUNTABLE TERMINATOR

In-line databus terminator

SPECIFICATIONS

MIL-STD-1553B (STANAG 3838)

PID (CNES)

Resistor
MIL-R-39007

Solder
ECSS-Q-ST-70-08
MIL-STD-2000, NHB 5300.4

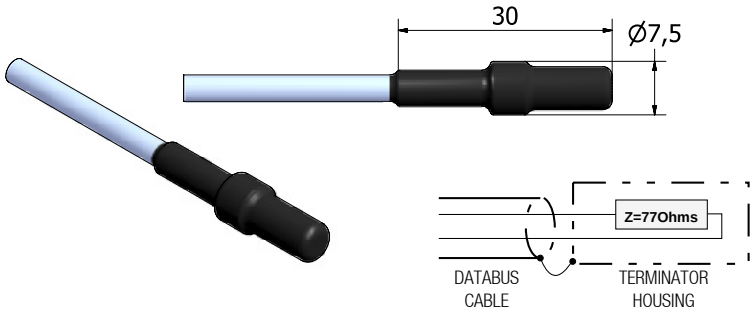
Derating
ECSS-Q-ST-30-11

Potting material
ECSS-Q-ST-70-02, ASTM E595
and ECSS-Q-ST-70-29
or NHB 8060.1.

All processes, materials
and components are
approved by CNES
(see CNES-PID-02AXON').

ESA: European Space Agency
CNES: French Space Agency
PID: Part Identification Document

AMB / S - I - XX



Electrical characteristics

- Impedance: Z = 77 Ω ±2%
- Insulation resistance (500 VDC):
  - Outer jacket / conductor: > 1000 MΩ min.
  - Between shield / conductors: > 1000 MΩ min.
- Dielectric withstanding strength:
  - outer jacket / shield: 500 VRMS
  - Between shield / conductors: 500 VRMS
- Shield connection resistance: 10 mΩ max.
- MTBF available following MIL-HDBK 217
  (environment and operating temperature to be specified)

Main characteristics

- Weight: < 3 g (without harnessing accessories)
- Traction resistance: 100 N
- Excellent vibration and shock resistance
- Crush resistance: 500 N

Environmental characteristics

- Operating temperature: -65°C to +150°C

Identification code

AMB /	S	I	XX
AXON' MICROBUS (see complete reference of the coupler on Bus Standard sheet, page 103).	**S: SPACE VERSION**	**IN-LINE BUS TERMINATOR**	CABLE REFERENCES **40: TWINAX BUS AWG 24 SB** (single braid) according to SSQ 21655 (NASA qualified). **41: TWINAX BUS AWG 24 DB** (double braid). **43: TWINAX BUS AWG 26 SB** (single braid). **44: TWINAX BUS AWG 26 DB** (double braid). **45: TWINAX BUS AWG 22 SB** (single braid) according to SSQ 21655 (NASA qualified). **80: TWINAX BUS AWG 24 SB** (single braid) according to ESCC 3902.002.20.

NOTE: CABLE LENGTH AND CABLE COLOUR TO BE DEFINED WHEN ORDERING.
These impedances can be integrated in the couplers

In-line ESD databus terminator

SPECIFICATIONS

MIL-STD-1553B (STANAG 3838)

PID (CNES)

Resistor
MIL-R-39007

Solder
ECSS-Q-ST-70-08
MIL-STD-2000, NHB 5300.4

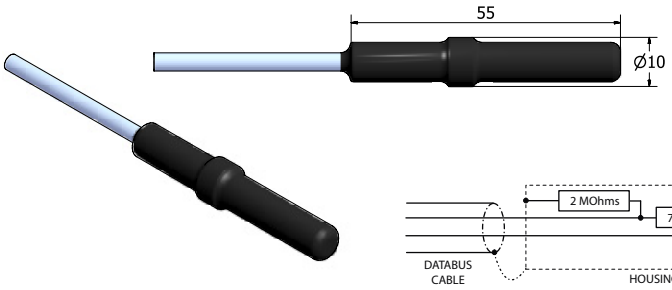
Derating
ECSS-Q-ST-30-11

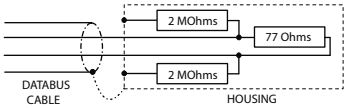
Potting material
ECSS-Q-ST-70-02, ASTM E595
and ECSS-Q-ST-70-29
or NHB 8060.1.

All processes, materials
and components are
approved by CNES
(see CNES-PID-02AXON').

ESA: European Space Agency
CNES: French Space Agency
PID: Part Identification Document

AMB / S - I - XX - X ESD





Electrical characteristics

- Impedance: Z = 77 Ω ±2%
- Insulation resistance (500 V_{DC}):
  - Outer jacket / conductor: > 1000 MΩ min.
  - Between shield / conductors: > 1000M Ω min.
- Dielectric withstanding strength:
  - outer jacket / shield: 500 V_{RMS}
  - Between shield / conductors: 500 V_{RMS}
- Shield connection resistance: 10 m Ω max.
- MTBF available following MIL-HDBK 217
  (environment and operating temperature to be specified).

Main characteristics

- Weight: < 12 g (without harnessing accessories)
- Traction resistance: 100 N
- Excellent vibration and shock resistance
- Crush resistance: 500 N

Environmental characteristics

- Operating temperature: -65°C to +150°C

Identification code

AMB /	S	I	XX	X ESD
AXON' MICROBUS	**S: SPACE VERSION**	**IN-LINE BUS TERMINATOR**	CABLE REFERENCES **40: TWINAX BUS AWG 24 SB** (single braid) according to SSQ 21655 (NASA qualified). **41: TWINAX BUS AWG 24 DB** (double braid). **43: TWINAX BUS AWG 26 SB** (single braid). **44: TWINAX BUS AWG 26 DB** (double braid). **45: TWINAX BUS AWG 22 SB** (single braid) according to SSQ 21655 (NASA qualified). **80: TWINAX BUS AWG 24 SB** (single braid) according to ESCC 3902.002.20.	**1:** one bleed off resistor. **2:** two bleed off resistors.

NOTE: CABLE LENGTH AND CABLE COLOUR TO BE DEFINED WHEN ORDERING.
These impedances can be integrated in the couplers

Dismountable bus terminator or stub impedance

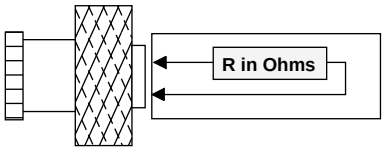
SPECIFICATIONS

MIL-STD-1553B (STANAG 3838)

PID (CNES)

AMB / S - R - or AMB / S - D

CONNECTOR REFERENCE TO BE DEFINED ACCORDING TO YOUR NEEDS



Electrical characteristics

PARAMETERS	ACTUAL
Impedance - AMB / S-D = bus terminator - AMB / S-R = stub impedance	 77 Ω 3k Ω or value to be specified
Insulation resistance between shield and conductors	> 1 000 MΩ minimum at 500 V_{DC}
Dielectric strength between shield and conductors	500 V_{RMS}
Shield connection resistance	Function of connector type

Mechanical and environmental characteristics

PARAMETERS	ACTUAL
Operating temperature	-65°C to +150°C (*)
Weight	according to connector type
Robust, light, compact construction (maximum reduction of space requirement)	
MTBF available following MIL-HDBK 217 (environment and operating temperature to be specified)	

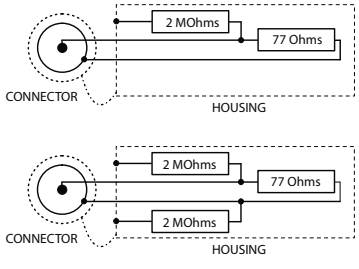
(*) Depends on the connector type.

To match the bus line (AMB / S -D) or to load a stub line by high impedance value, the type of connector must be specified)

ESD protection

on request when possible.
A protective passive resistance can be added to evacuate Electrical Static Discharge.

77 Ω TERMINATOR WITH ESD PROTECTION



Identification code

AMB /	S	X	CONNECTOR IDENTIFICATION
AXON' MICROBUS connector series to be specified.	**S: SPACE VERSION**	**R: DISMOUNTABLE STUB IMPEDANCE** 3 kΩ or value to be specified. **D: DISMOUNTABLE BUS TERMINATOR** 77 Ω.	**Specified on request.**

D-Sub dismountable bus terminator or stub impedance

SPECIFICATIONS

MIL-STD-1553B (STANAG 3838)

PID (CNES)

AMB / S - R
AMB / S - D
D-SUB SERIES

CONNECTOR TO BE DEFINED
ACCORDING TO YOUR NEEDS
(NUMBER OF CONTACTS, DENSITY, SEX)

Use

To match the bus line (AMB / S - D) or to load a stub line by high impedance value, the connector type must be specified.

Electrical characteristics

- Impedance:
  - AMB / S - D = Bus terminator (77 Ω)
  - AMB / S - R = Stub impedance (3 kΩ or value to be specified)
- Shield connection resistance: depends on connector type.
- MTBF available following MIL-HDBK 217
  (environment and operating temperature to be specified)

Mechanical characteristics

- Weight: according to connector type
- Robust, lightweight, compact construction

Environmental characteristics

- Operating temperature: -65°C to +150°C

ESD protection

on request when possible.
A protective passive resistance can be added to evacuate Electrical Static Discharge.

Identification code

AMB /	S	X	CONNECTOR IDENTIFICATION
AXON' MICROBUS Connector series to be specified.	**S: SPACE VERSION**	**R: DISMOUNTABLE STUB IMPEDANCE** 3 kΩ or value to be specified. **D: DISMOUNTABLE BUS TERMINATOR** 77 Ω.	**Specified on request.**

ACB1 dismountable databus terminator or stub impedance

SPECIFICATIONS

MIL-STD-1553B
Digital time division
command/ response
multiplex databus

MIL-G-45204 Class 1
Surface treatment
for contact

ASTM-B-733
Surface treatment
for body and ferrule

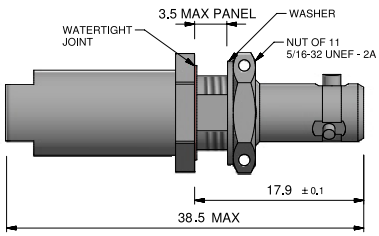
AMB / SR - R
AMB / SR - D
ACB1 SERIES

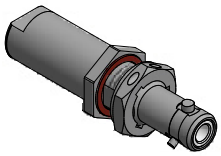
BULKHEAD JACK TERMINATOR

SEE THE RELEVANT SPECIFICATION OF THE CONNECTOR

BULKHEAD JACK TERMINATOR

Dimensions are in millimetres



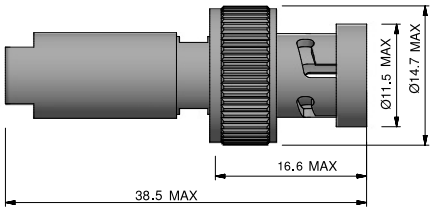


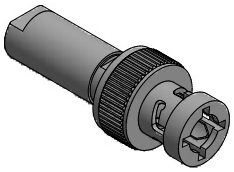
PLUG TERMINATOR

SEE THE RELEVANT SPECIFICATION OF THE CONNECTOR

PLUG TERMINATOR

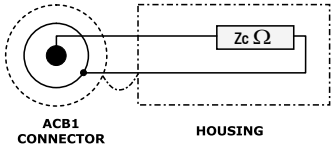
Dimensions are in millimetres





ELECTRICAL SCHEME

AXON's terminators are designed for MIL-STD-1553B databus applications. AXON's terminator is fitted with ACB1 connector.



Identification code

AMB	S	X	ACB1	XX	XX	X
AXON' MICROBUS	**SR: SPACE RATED VERSION**	**DISMOUNTABLE TERMINATOR** **D:** 77Ω Impedance. **R:** 3 kΩ Impedance or value to be specified.	**AXON' CONNECTOR BUS TYPE 1**	**TYPE OF CONNECTOR** **BK:** Bulkhead jack. **PG:** plug.	**TYPE OF CONFIGURATION*** **3A:** configuration 3A. **04:** configuration 04.	**TYPE OF CONTACT** **P:** pin contact. **S:** socket contact.

*= please contact us for other configurations

Materials and surface treatment

PARTS	ACTUAL
Contact	Copper alloy / golding surface treatment in accordance with MIL-G-45204 CLASS 1 (>1.27 µm)
Body	Brass / electroless nickel plating according to ASTM-B-733 (5 ±1 µm)

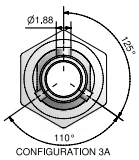
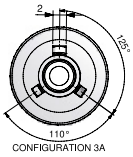
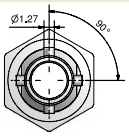
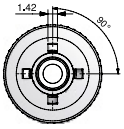
Electrical characteristics

PARAMETERS	ACTUAL
Insulation resistance Inner contact / Shield (sea level)	1 000 MΩ minimum at 500 VDC
Shield connection resistance	10 mΩ maximum
Impedance Bus terminator	77 Ω nominal
Stub load	3 kΩ nominal or value to be specified

Mechanical and environmental characteristics

PARAMETERS	ACTUAL
Operating temperature	-65°C to +150°C
Bulkhead jack terminator or load	14 g maximum
Plug terminator or load	17 g maximum
Excellent vibration and shock resistance	

Connector configuration

TYPE OF CONFIGURATION	BK CONNECTOR	CORRESPONDING KEYING	PG CONNECTOR	CORRESPONDING KEYING
3A	**AMB/SR-X-ACB1-BK 3A**	 CONFIGURATION 3A	**AMB/SR-X-ACB1-PG 3A**	 CONFIGURATION 3A
04	**AMB/SR-X-ACB1-BK 04**	 CONFIGURATION 4 (-)	**AMB/SR-X-ACB1-PG 04**	 CONFIGURATION 4 (-)

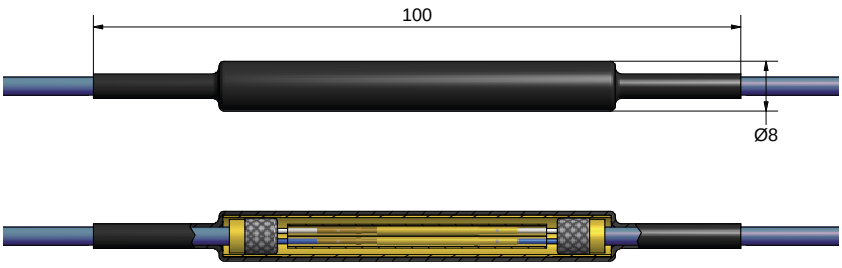
In-line databus splice crimp

SPECIFICATIONS

MIL-STD-1553 B
Digital time division command / response multiplex databus

MIL-C-39029
Contacts, electrical connector, general specification

AMB / S - S - XX



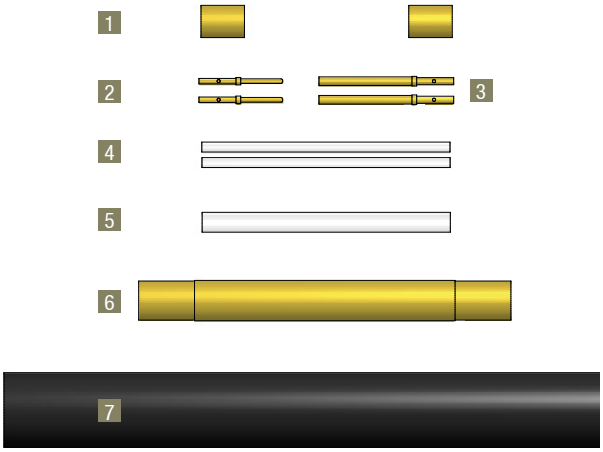
Length end-to-end including heat shrink tube.

DIMENSIONS in mm

AXON's AMB/S-S-xx splices are designed for MIL-STD-1553 B databus applications.
These splices are crimp terminated, can be fitted to AWG 24 & 26 databus cables and are designed to comply with MIL-STD-1553B.

Construction

The splice consists of 11 pieces as follows:



1. CRIMP FERRULES FOR SINGLE OR DOUBLE BRAID CABLE
2. M39029/58-360 PIN CONTACT
3. M39029/56-348 SOCKET CONTACT
4. INNER HEAT-SHRINKABLE TUBING (1/16'') (PRIMARY INSULATION)
5. INNER HEAT-SHRINKABLE TUBING (1/8'') (SECONDARY INSULATION)
6. HOUSING
7. INSULATION OUTER HEAT-SHRINKABLE PART

Identification code

AMB /	S	S	XX
AXON' MICROBUS	**S: SPACE VERSION**	**SPLICE**	**TYPE OF FERRULE** **SB** for single braid cable. **DB** for double braid cable.

Materials and plating

COMPONENT	MATERIAL / PLATING
Inner contacts	Brass / Gold plated
Housing / ferrule	Brass / Gold plated
Heat shrinkable sleeves	VITON®

Mechanical characteristics

PARAMETERS	
Weight	6 g maximum

Electrical characteristics

PARAMETERS	VALUE	UNITS	MIN / MAX
Insulation resistance (under 500 DC)	1000	M Ω	minimum
Contact resistance	8	m Ω	maximum
Characteristic impedance	77	Ω	nominal

Type of cables

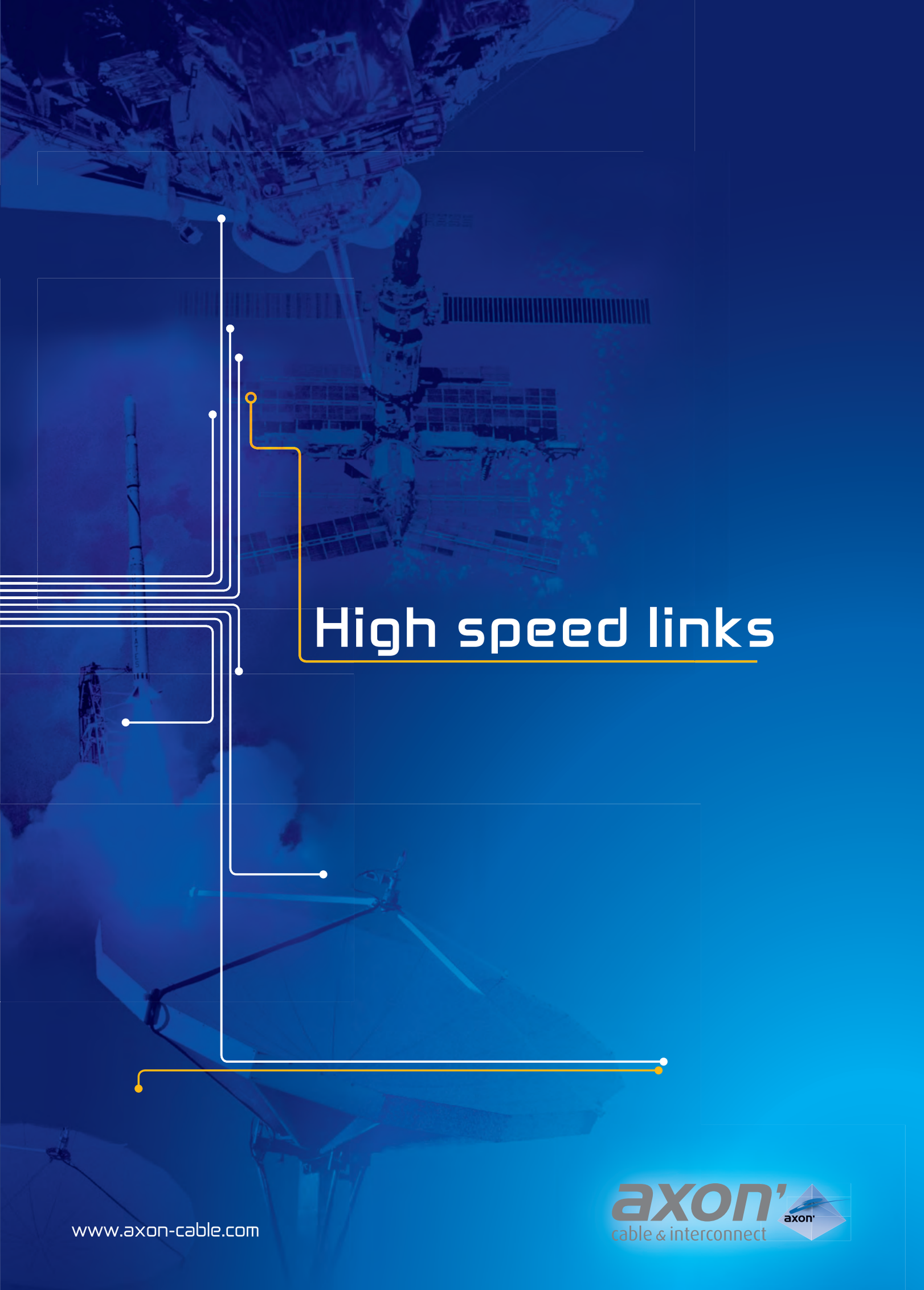
PARAMETER	ACTUAL
Type of cables	All types of AWG 26 to 24 shielded twisted pairs with an outer diameter < 3.8 mm

Tooling used for crimping the AMB/S-S-XX splice

AXON' CABLING INSTRUCTION: 95021-PM_SPLICE-01-A
(respect the crimping rules for MIL-C-39029 contacts or ESA-ECSS-Q-70-26 for space applications)

TYPE OF CRIMPING	CRIMPING TOOL	DIE
PIN CONTACT	M22520/2-01	M22520/2-09 Setting 2 for AWG 26 Setting 4 for AWG 24
SOCKET CONTACT	M22520/2-01	M22520/2-07 Setting 2 for AWG 26 Setting 4 for AWG 24
HOUSING	M22520/10-01	M22520/10-23

VITON® IS A REGISTERED TRADEMARK OF DUPONT



High speed links

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axon' cable & interconnect

High speed links

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High speed links

Space applications

High speed data links offered by Axon' Cable are designed to be used in spacecraft for different applications including:

- Satellite and launcher (platform) cabling:
  - Connection between the mast of the launcher and the control system
  - Spacecraft communication network
  - Driver technology compatibility: LVDS (Low Voltage Differential Signaling)
- High Data Rate payloads:
  - Interconnection of high definition imagery sensors in satellites
  - Synthetic aperture radar and hyperspectral optical instruments
  - Driver technology compatibility: CML (Current Mode Logic)

Which Axon' solutions for which data rate ?

PROTOCOL \ DATA RATE	UP TO 1 MB/S	UP TO 400 MB/S	UP TO 3GB/S	UP TO 10 GB/S
SpaceWire	9-way Micro-D (Standard cable: ESCC3902 003 variant 01 and 02) or low mass cable (ESCC3902 004 variant 01) or MicroMach® for higher electrical performances (XTalk / EMI / signal integrity)		-	-
SpaceFibre, WizardLink	-			AxoMach® & AxoMach® SpaceFibre
TT-Ethernet (Etherspace)	MicroMach® (also suited to CAT6A and other Ethernet protocols)*			
RS 422 / RS 485 / CAN	D-Sub & Micro-D connectors,120 Ω twisted shielded pairs, ESCC3902 002 Variant 21 to 30 (100 or 120 Ω shielded pairs).	-	-	-
BUS 1553	D-Sub & ACB1 connectors, Bus couplers, ACB1 Triaxial connectors	-	-	-

*: Compatible with the following standards:

- 10BASE-T
- 100BASE-TX
- 100BASE-T4
- 100BASE-T
- 2.5GBASE-T
- 5GBASE-T
- 10GBASE-T
- ATM-25
- ATM-51
- ATM-155
- 100VG-AnyLan
- TR-4
- TR-16 Active
- TR-16 Passive

SpaceWire

Axon' has developed cables and connectors for SpaceWire interconnects, allowing reliable transmission of data at high speed (between 2 Mb/s and 400 Mb/s) between on-board devices in spacecraft.

SpaceWire links: reliable data transmission

- Based on LVDS spacecraft communication system to ECSS-E-ST-50-12C
- Data transfer up to 400 Mb/s while maintaining a wide working margin
- Low skew, crosstalk and signal attenuation
- Robust cable

Signal integrity

AXON' digital data transmission bus assemblies which meet the MIL-STD-1553 standard are used for military and aeronautic applications, and have also been integrated within the space environment for over 10 years.
In addition to bus harnesses which ensure the connection between on-board devices, SpaceWire links make possible the transfer of up to 400Mb/s while maintaining a wide working margin, thanks to the use of CELLOFLON®, expanded PTFE developed by AXON'.

The ESCC 3902/003 and 3902/004 qualified cable and ESCC 3401/029 EPPL2 connectors and accessories manufactured by AXON' protect the integrity of LVDS signals (Low Voltage Differential Signalling) provided by the devices. The cabling has been optimised in order to minimise any mismatching and crosstalk between lines.

A test report validates every SpaceWire link. The electrical performance, which depends on the transmission speed, can be shown with an eye pattern which includes characteristics such as signal jitter. AXON' can generate and analyse high speed signals up to 40 Gb/s in base band and for Ethernet applications.

SPACEWIRE LINKS

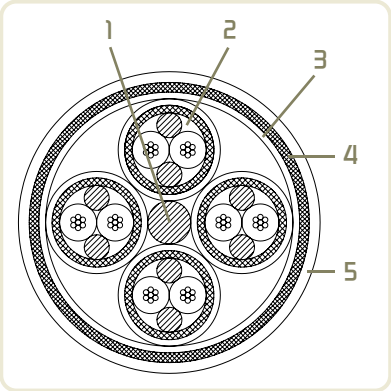
Engineering Model or Flight Model designs

AXON' can offer several designs for Engineering Models (EM) or Flight Models (FM) on request. For custom Lab test harnesses, for example, AXON' can offer lightweight design configurations for a more cost effective solution (such as a one piece connector and backshell system).

Environmental characteristics

Radiation: up to 400MRad with ESCC 3902/004 Low Mass SpW cable (Static use).

28AWG SpaceWire cable



CONSTRUCTION

AXON' 28AWG SpaceWire cable qualified to **ESCC 3902/003 variant 01** (AXON' part number: P532242) consists of 4 shielded twisted pairs covered by an overall shield and outer jacket, as shown in the specification.

1 - CELLOFLON® expanded PTFE filler

- Diameter: 1.00 mm nom.

2 - 4 x 100 Ω 28AWG BUS Lines

CONDUCTOR AWG 2807

- Stranded silver plated copper alloy 2 µm.
- 7 x 0.127 mm strands.
- Diameter: 0.38 mm nominal.
- Cross section: 0.089 mm^2 nominal.
- Resistance: 23 Ω/100 m nominal.

DIELECTRIC: CELLOFLON® expanded PTFE

- Colour: blue / white.

BRAIDED SHIELD

- Material: silver plated copper 2.5 µm.
- Strand diameter: 0.079 mm.

JACKET

- Material: extruded PFA.
- Diameter: 2.37 mm nominal.
- Colour: white.

3 - CELLOFLON® expanded PTFE tape

4 - Braided shield

- Material: silver plated copper 2.5 µm.
- Strand diameter: 0.102 mm.

5 - Outer jacket

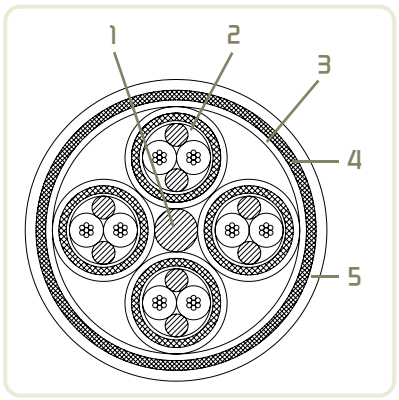
- Material: PFA.
- Colour: white.

MAIN CHARACTERISTICS

- Outer diameter: 7.5 mm maximum.
- Weight: 85 g/m maximum.
- Operating temperature: -200 / +180°C.
- Impedance (between wires): 100 Ω (±6 Ω) at 400 MHz.

28AWG CLASSIC SPACEWIRE CABLE

26AWG SpaceWire cable



CONSTRUCTION

AXON' 26AWG SpaceWire cable qualified to **ESCC 3902/003 variant 02** (AXON' part number: P544806) consists of 4 shielded twisted pairs covered by an overall shield and outer jacket, as shown in the specification.

1 - CELLOFLON® expanded PTFE filler

- Diameter: 1.40 mm nominal.

2 - 4 x 100 Ω 26AWG BUS Lines

CONDUCTOR AWG 2607
- Stranded silver plated copper alloy 2 µm.
- 7 x 0.160 mm strands.
- Diameter: 0.48 mm nominal.
- Cross section: 0.141 mm^2 nominal.
- Resistance: 14 Ω/100 m nominal.

DIELECTRIC: CELLOFLON® expanded PTFE.
- Colour: blue / white.

BINDER

BRAIDED SHIELD
- Material: silver plated copper 2.5 µm.
- Strand diameter: 0.079 mm.

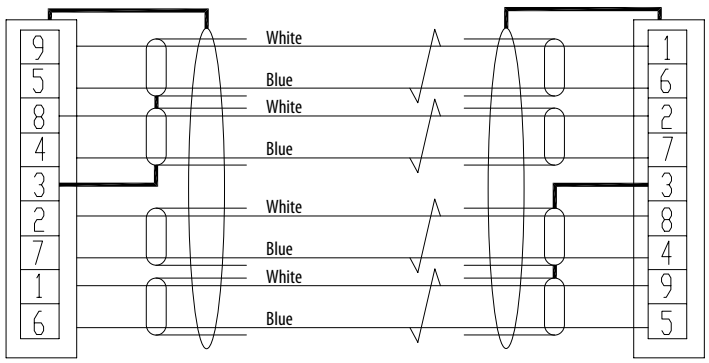
JACKET
- Material: extruded PFA.
- Diameter: 3.05 mm nominal.
- Colour: white.

3 - CELLOFLON® expanded PTFE tape

4 - Braided shield
- Material: silver plated copper 2.5 µm.
- Strand diameter: 0.102 mm.

5 - Outer jacket
- Material: PFA.
- Colour: blue

MAIN CHARACTERISTICS
- Outer diameter: 9.00 mm maximum.
- Weight: 115 g/m maximum.
- Operating temperature: -200 / +180°C.
- Impedance (between wires): 100 Ω (±6 Ω) at 400 MHz.



WIRING DIAGRAM ACCORDING TO ECSS-E-ST-50-12C REV 1 - FOR TYPE AL (LEGACY) LINKS

Test and measurements

- Eye pattern measurements (up to 10 Gb/s),
  - Jitter measurements,
  - Eye height and width,
  - Q factor,
  - Skew.

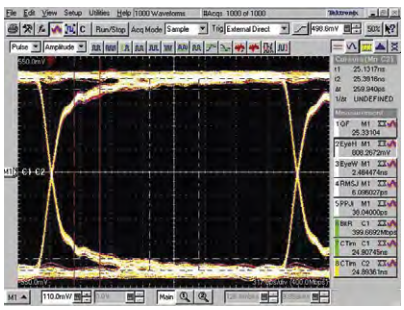
- TDR (Time Domain Reflectometry) analysis,
  - Impedance analysis,
  - Skew.

- BER test (Bit Error Rate),
  - PRBS (Pseudo Random Binary Sequence) generation and analysis.

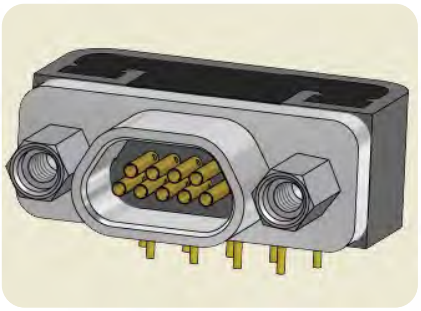
Connection

For either cable size (AWG26 or AWG28), there are two possibilities to connect the link to the PCB:
- Pigtail whose wires are soldered to the PCB.
- Special 9 way CBR connector (each line has the same electrical length to reduce the skew between one another).

SPACEWIRE LINKS



EYE PATTERN - 400 MBPS



9 WAY CBR CONNECTOR

Low Mass solutions

With long experience in space wiring and a mastery of many advanced cabling technologies, AXON' has designed two new solutions to lighten traditional high speed links: The Low Mass SpaceWire and the Ultra Low Mass Coax Link.

LOW MASS SPACEWIRE LINK

Weight saving: a key issue in space

- AXON has developed **Low Mass SpaceWire** cable specifically for SpaceWire applications, which is uniquely qualified to **ESCC3902/004**. The cable assembly is terminated with ESCC 3401/029 EPPL 2 Micro-D connectors. Low Mass SpaceWire is 50% lighter than standard SpaceWire.
- The **Ultra Low Mass Coax Link**, based on AXON's coaxial cable expertise, is almost 30% lighter still, and is significantly smaller and even more flexible. It is not ESA endorsed for the SpaceWire protocol, but may still be interesting for certain applications.

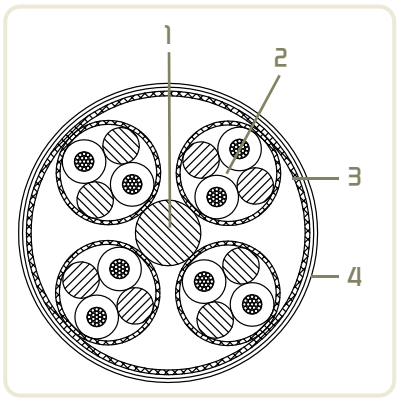
Main characteristics

	Classic SpaceWire cable ESCC 3902.003.01	Low Mass SpaceWire cable ESCC 3902.004.01	Ultra Low Mass Coax Link with overall shield	Ultra Low Mass Coax Link without overall shield
Mass (g/m)	85 max.	42 max.	32.5 max.	30 max.
Overall Ø (mm)	7 max.	6.5 max.	4.5 max.	4.2 max.
Static bend radius	45	25	10	6
Dynamic bend radius	60	30	20	15
Impedance (Ω)	100 ±6	100 ±6	2x50 ±2	2x50 ±2
Capacitance (pF) - intra pair - inter pair	 < 50 < 90	 < 50 < 90	 < 48 < 97	 < 48 < 97
Resistance DC (Ω/m)	0.23	0.23	0.90	0.90
Intra pair skew (ps/m)	< 80	< 50	< 20	< 20
Inter pair skew (ps/m)	< 130	< 100	< 20	< 20
Average α (dB/m) @1 GHz Cable length (for -6 dB atten.)	-1.5 4.5 m max.*	-1.4 4.6 m max.*	-2.6 2.3 m max.*	-2.6 2.3 m max.*

*: for a 400 Mb/s data rate

Low Mass 28AWG SpaceWire cable

Making use of AXON's CELLOFLON® expanded PTFE, alveolar a-PTFE dielectrics and AXON's patented AXALU® silver plated aluminium shields, the new **Low Mass SpaceWire** cable saves almost half the weight compared to conventional SpaceWire cable constructions.



CONSTRUCTION

AXON's Low Mass 28AWG SpaceWire cable according to the **ESCC 3902/004.01** requirements (AXON' part number: P551259) consists of 4 shielded twisted pairs covered by an overall shield and outer jacket, as shown in the specification.

1 - CELLOFLON® expanded PTFE filler

- Diameter: 1.35 mm nom.

2 - 4 x 100 Ω 28AWG BUS Lines

CONDUCTOR AWG 2819

- Stranded silver plated copper alloy (2 µm minimum).
- 19 x 0.079 mm strands.
- Diameter: 0.395 mm nominal.
- Cross section: 0.093 mm^2 nominal.
- Resistance: 23 Ω/100 m nominal.

DIELECTRIC: Alveolar PTFE.

- Colour: blue / white.

INNER BRAIDED SHIELD

- Material: silver plated aluminium (2 µm minimum).
- Strand diameter: 0.079 mm.

3 - Braided shield (in electrical contact with the inner braided shields)

- Material: silver plated aluminium (2 µm minimum).
- Strand diameter: 0.100 mm.

4 - Outer jacket

- Material: Expanded PTFE tape (CELLOFLON®) under a Polyimide tape.

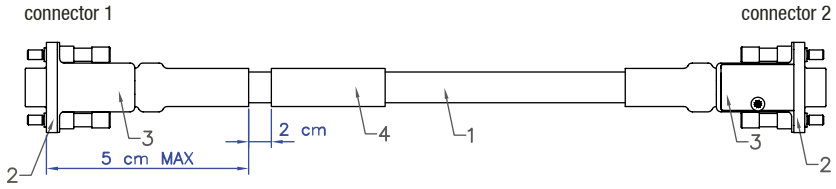
MAIN CHARACTERISTICS

- Outer diameter: 6.5 mm maximum.
- Bend radius: 25 mm minimum for fully static applications.
- Weight: 42 g/m maximum.
- Operating temperature: -100 / +150°C.
- Impedance (between wires of a pair): 100 Ω (±6 Ω) at 400 MHz.
- All inner shields are in contact with overall shield.

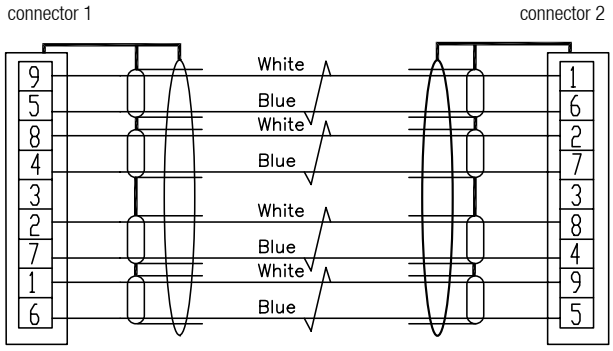
MAIN ADVANTAGES COMPARED TO THE ESCC3902/003 VARIANT 01

- Smaller bend radius (routing made easier)
- Approximately half the weight
- Reduced intra-pair and inter-pair skew
- Improved resistance to radiation (evaluation performed up to 300 Mrad)

Part list



1 - Low Mass SpaceWire cable (P551259)
2 - Micro-D plug connector (MDSA209P000B: 9 ways / high phosphorous nickel plated)
3 - High phosphorous nickel plated backshell and stainless steel 2-56 UNC-2A fastners
4 - Marking sleeve

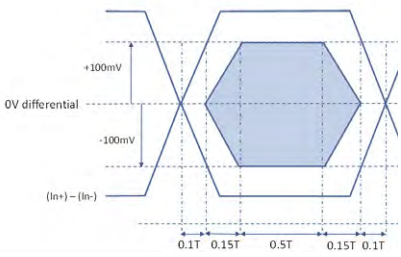


WIRING DIAGRAM (PIN ALLOCATION ACCORDING TO ECSS-E-ST-50-12C Rev1, FOR TYPE A LINKS)

ESCC	3902.003/01	3902.004/01
PART NUMBER	P532242	**P551259**
WEIGHT	85 g/m	**42 g/m**
DIAMETER	7 mm max.	**6.5 mm max.**

Cable shield connection: All shields are terminated to the shell of the Micro-D connectors. Alternatively, the shields can also be connected to pin 3 at both ends on request.
Skew inter pair: 0.1 ns/m maximum. / **Skew intra pair**: 0.05 ns/m maximum.

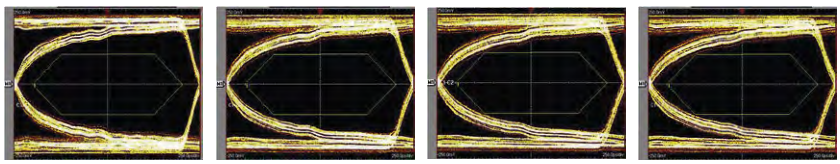
Depending on the required frequency and data rate, this assembly can be up to 10 meters long without exceeding the 6 dB attenuation limit. This limit is measured at the 5th harmonic of the fundamental equivalent frequency of the LVDS signal (250MHz for 100Mb/s; 500MHz for 200Mb/s or 1GHz for 400Mb/s). The real requirement is to be outside the mask (see above). Please contact us for more details.



SPACEWIRE PERFORMANCES MASK FOR EYE PATTERN MEASUREMENT.
EYE PATTERN MODEL FROM ECSS-E-ST-50-12C REV 1.

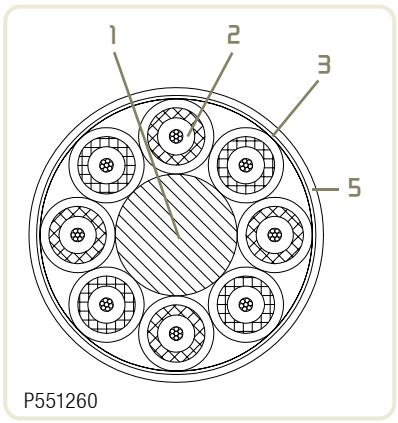
Test and measurements

- **Eye pattern measurements (up to 10 Gb/s)**: Jitter measurements, Eye height and width, Q factor and Skew.
- **TDR (Time Domain Reflectometry) analysis**: Impedance analysis and Skew.
- **BER test (Bit Error Rate)**: PRBS (Pseudo Random Binary Sequence) generation and analysis.
- **Crosstalk**

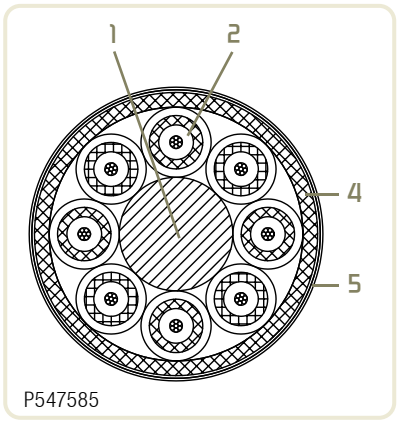


EYE PATTERN DIAGRAM MEASUREMENT AT 400 Mb/s FOR EACH PAIR OF A LOW MASS SPACEWIRE ON A 4.5 m ASSEMBLY.
WORST CASE OF AMPLITUDE (250 mV peak).

Ultra Low Mass Coax Link



P551260



P547585


ULTRA LOW MASS COAX LINK

The **Ultra Low Mass Coax Link** based on AXON' coaxial cable expertise, is almost 30% lighter than the already very light Low Mass SpaceWire cable. 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. Although these links meet all SpaceWire performance requirements, because they are based on coaxial, rather than twisted pair constructions they are not formally endorsed by ESA for SpaceWire use.
At the customer's discretion, however, they can prove an interesting option for applications where installation space and mass budgets are extremely limited, or particularly where an alternative protocol to SpaceWire is in use.
Important: Potential users of this solution must ensure for themselves that the cable is compatible with their application.

CONSTRUCTION

AXON's Ultra Low Mass Coax Link (AXON' part numbers: P551260 for the version without overall shield and P547585 for the version with) consists of 8 coaxial cables stranded around a filler and outer tape, as shown in the specification.

1 - CELLOFLON® expanded PTFE filler
- Diameter: 1.70 mm nominal.

2 - 8 x 50 Ω SM50 Coaxial cables

CONDUCTOR AWG 3407
- Stranded silver plated copper alloy (2 µm).
- 7 x 0.063 mm strands.
- Diameter: 0.187 mm nominal.
- Cross section: 0.020 mm^2 nominal.
- Resistance: 90.9 Ω/100 m nominal.

DIELECTRIC: PTFE
- Colour: white.

BRAIDED SHIELD
- Material: silver plated copper (2.5 µm).
- Strand diameter: 0.063 mm.

JACKET
- Material: extruded PFA.
- Colour: white.

3 - CELLOFLON® expanded PTFE tape (on P551260 only)

4 - Braided shield (on P547585 only)

5 - Polyimide tape (single layer on P551260, double layer on P547585)

MAIN CHARACTERISTICS

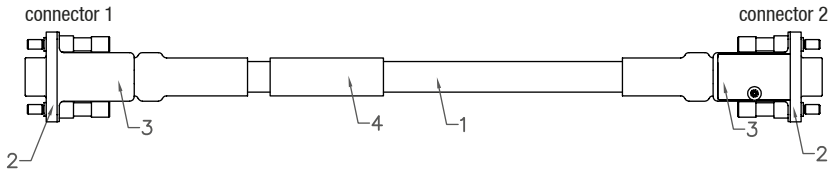
- Outer diameter: 4.20 mm maximum (4.50 mm with overshield).
- Bend radius: 6 mm minimum for fully static applications.
- Weight: 30 g/m maximum (32.5 g/m with overshield).
- Operating temperature: -100 / +150°C.
- Impedance (between wires of a pair): 8x50 Ω at 400 MHz.

MAIN ADVANTAGES COMPARED TO THE ESCC 3902/003 VARIANT 01

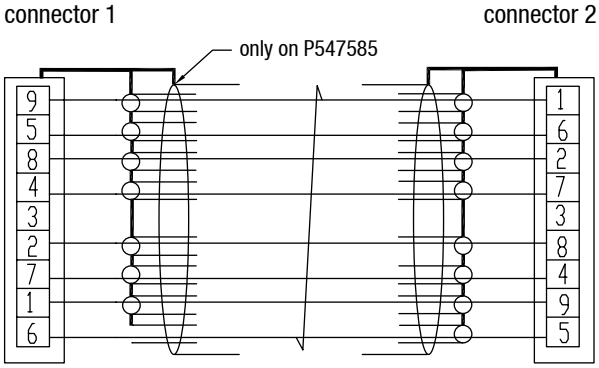
- Smaller bend radius (routing made easier)
- More than half the weight saving
- Reduced intra-pair and inter-pair skew
- Improved resistance to radiation

Note: The maximum length is shorter due to a higher attenuation.
Ultra Low Mass Coax Links can be terminated with 9 way Micro-D connectors (such as are employed on SpaceWire and Low Mass SpaceWire links) or ultra miniature 15 way Nano-D connectors, suitable for applications where the connector interface area is extremely limited.

Part list



1 - Ultra Low Mass Coax cable (P551260 or P547585)
2 - Micro-D plug connector (MDSA209P000B: 9 ways / high phosphorous nickel plated)
3 - High phosphorous nickel plated backshell and stainless steel 2-56 UNC-2A fastners
4 - Marking sleeves

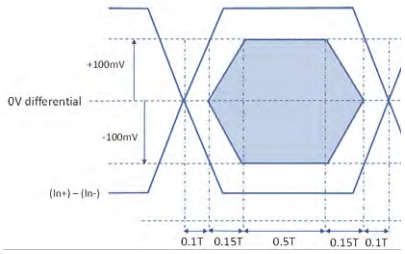


WIRING DIAGRAM (PIN ALLOCATION)

ESCC	3902.003/01	Ultra Low Mass Coax cable with overall shield	Ultra Low Mass Coax cable without overall shield
PART NUMBER	P532242	**P547585**	**P551260**
WEIGHT	85 g/m	**37.5 g/m max.**	**32.5 g/m max.**
DIAMETER	7 mm max.	**4.5 mm max.**	**4.2 mm max.**

Cable shield connection: All coaxial shields are terminated to the shell of both connectors.
Skew inter pair: 0.1 ns/m maximum. / **Skew intra pair**: 0.02 ns/m maximum.

Depending on the required frequency and data rate, this assembly can be up to 4 meters long without exceeding the 6 dB attenuation limit. This limit is measured at the 5th harmonic of the fundamental equivalent frequency of the LVDS signal (250MHz for 100Mb/s; 500MHz for 200Mb/s or 1GHz for 400Mb/s). The real requirement is to be outside the mask (see above). Please contact us for more details.

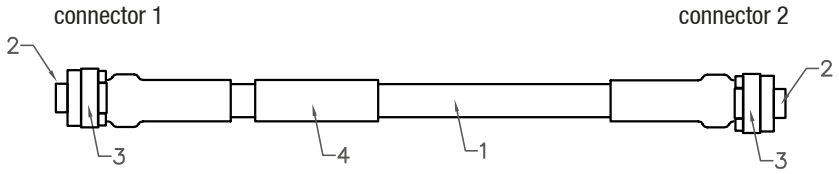


SPACEWIRE PERFORMANCES MASK FOR EYE PATTERN MEASUREMENT.
EYE PATTERN MODEL FROM ECSS-E-ST-50-12C REV 1.

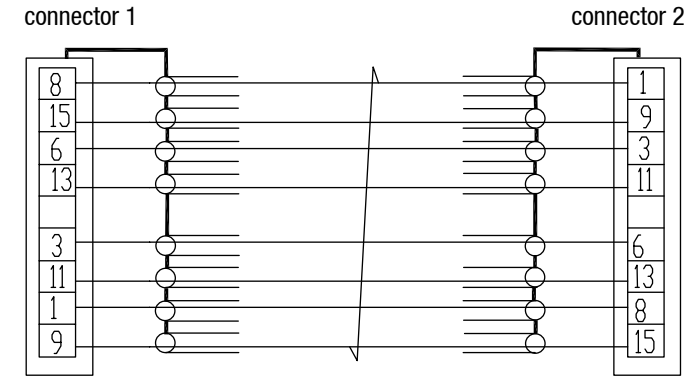
Test and measurements

- **Eye pattern measurements (up to 10 Gb/s)**: Jitter measurements, Eye height and width, Q factor and Skew.
- **TDR (Time Domain Reflectometry) analysis**: Impedance analysis and Skew.
- **BER test (Bit Error Rate)**: PRBS (Pseudo Random Binary Sequence) generation and analysis.
- **Crosstalk**

Part list



1 - Ultra Low Mass Coax cable (P551260 or P547585)
2 - Nano-D plug connector (ND2A215P000B: 15 ways / nickel plated)
3 - Nickel plated backshell and stainless steel 0-80 UNF fasteners
4 - Marking sleeves



WIRING DIAGRAM (PIN ALLOCATION)

ESCC	3902.003/01	Ultra Low Mass Coax cable with overall shield	Ultra Low Mass Coax cable without overall shield
PART NUMBER	P532242	**P547585**	**P551260**
WEIGHT	85 g/m	**37.5 g/m max.**	**32.5 g/m max.**
DIAMETER	7 mm max.	**4.5 mm max.**	**4.2 mm max.**

Cable shield connection: All coaxial shields are terminated to the shell of both connectors.
Skew inter pair: 0.1 ns/m maximum. / **Skew intra pair**: 0.02 ns/m maximum.

Depending on the required frequency and data rate, this assembly can be up to 4 meters long without exceeding the 6 dB attenuation limit. Please contact us for more details.

Test and measurements

- **Eye pattern measurements (up to 10 Gb/s)**: Jitter measurements, Eye height and width, Q factor and Skew.
- **TDR (Time Domain Reflectometry) analysis**: Impedance analysis and Skew.
- **BER test (Bit Error Rate)**: PRBS (Pseudo Random Binary Sequence) generation and analysis.
- **Crosstalk**

MicroMach®

As data rates and EMI requirements increase, Axon' introduces MicroMach®, an impedance matched high speed connector, initially developed for optimized SpaceWire performance, but which can also be used for other protocols such as SpaceFibre, Wizardlink, & TT-Ethernet.

MICROMACH® AND LOW MASS SPACEWIRE LINK

Higher performance

- Compact,
- Matched 100 Ω impedance pairs: excellent continuity of signal,
- Low crosstalk between ways,
- Enjoys a robust EMC design, providing protection for both the cable and the equipment,
- Is capable of data rates well in excess of typical SpaceWire performance - up to 3 Gb/s.

Electrical Characteristics

Characteristics		Specification		
Max. Operating Data Rate		3 Gb/s		
Mating / unmating forces		MF < 25N 3N < UF < 25N		
Shield resistance		11 mΩ/m		
Mated shell conductivity		5 mΩ		
Characteristic impedance		90Ω < ZC < 110Ω		
Crosstalk FEXT and NEXT		< -50dB up to 1 GHz		
Shielding effectiveness		< -80dB up to 1 GHz		
		3902/003 SpaceWire AWG26	**3902/003 SpaceWire AWG28**	**3902/004 Low Mass SpaceWire**
Intra-pair Skew		Max. 80 ps/m	Max. 80 ps/m	Max. 50 ps/m
Inter-pair Skew		Max. 130 ps/m	Max. 130 ps/m	Max. 100 ps/m
Insertion Loss	Up to 1.5 GHz	-2.25 dB/m	-2.95 dB/m	-2.95 dB/m
	Up to 3 GHz	-3.70 dB/m	-7.90 dB/m	-4.90 dB/m
	Up to 4.5 GHz	-5.00 dB/m	-6.65 dB/m	-6.65 dB/m

Mechanical characteristics

Characteristics	Specification
Maximum cable weight - SpaceWire, AWG26 (ESCC 390200302) - SpaceWire, AWG28 (ESCC 390200301) - Low Mass SpaceWire, AWG28 (ESCC 390200401)	 - 115g/m max. - 85 g/m max. - 42 g/m max.
Mating force	< 25 N
Demating force	3 N < demating force < 25 N
Operating and storage temperature	-55°C to +125°C

ESCC Standard	Connector	Nom. Weight (g)
	Cable mount connectors	
3409-002	01 & 02	9.5 g
	03 & 04	9 g
	PCB connectors	
3401-095	01	4.5 g
	02	5 g
	03	5.5 g
	Saver connectors	
3401-096	01	7.5 g

Wiring

When ordering a **MicroMach assembly** for normal SpaceWire use or as a primary SpW test cable, **indirect (or "crossover") wiring** should be selected. Typically, this is most likely to be with a male to male link.

Contact linking for indirect wiring

Variant	Connector	Pin numbers							
ESCC 3409-002 codes 01 or 02	1st connector, e.g. code 01 or 02 (male)	1	2	3	4	5	6	7	8
	2nd connector, e.g. code 01 or 02 (male)	3	4	1	2	7	8	5	6

However, if ordering a **MicroMach SpaceWire Extension cable**, to extend the length of an existing MicroMach SpaceWire cable, for example, when entering a TVAC chamber, **direct wiring** should be, to avoid negating the crossover effect. Typically, this may be with a female to male link.

Contact linking for direct wiring

Variant	Connector	Pin numbers							
ESCC 3409-002 codes 01 & 03 or 02 & 04	1st connector, e.g. code 01 or 02 (female)	1	2	3	4	5	6	7	8
	2nd connector, e.g. code 01 or 02 (male)	1	2	3	4	5	6	7	8

Signals

Pin / socket 1: Dout- Pin / socket 2: Dout+ Pin / socket 3: Din- Pin / socket 4: Din+
Pin / socket 5: Sout- Pin / socket 6: Sout+ Pin / socket 7: Sin- Pin / socket 8: Sin+

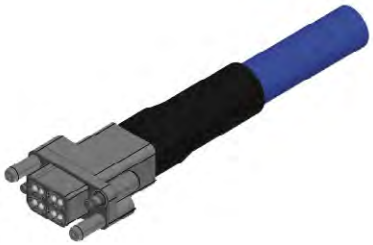
MICROMACH® cable mount connectors

- EMI seals: conductive silicone based rubber
- Shrinkable strain relief: fluoropolymer

Materials:
- Housing and shield termination: 25.4µm minimum high phosphorus nickel plating on aluminium alloy
- Insert: PEEK
- Contact: 1.27µm gold over 1.27µm nickel plating on copper alloy
- Hardware: Stainless steel

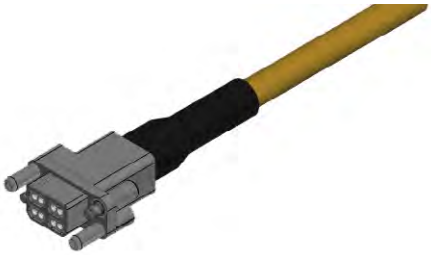
MicroMach® AWG26 Male In-line Plug

ESCC 3409/002 - CONNECTOR CODE 01 (see details page F-22)



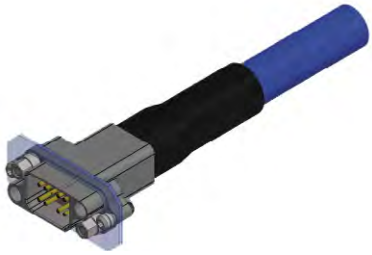
MicroMach® AWG28 Male In-line Plug

ESCC 3409/002 - CONNECTOR CODE 02 (see details page F-22)



MicroMach® AWG26 Female Panel Mount Jack

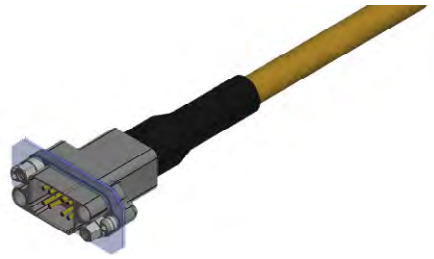
ESCC 3409/002 - CONNECTOR CODE 03 (see details page F-23)



Dimensions in mm. All ESCC specifications are subject to change. Please refer to https://escies.org for latest specifications.

MicroMach® AWG28 Female Panel Mount Jack

ESCC 3409/002 - CONNECTOR CODE 04 (see details page F-23)



Dimensions in mm. All ESCC specifications are subject to change. Please refer to https://escies.org for latest specifications.

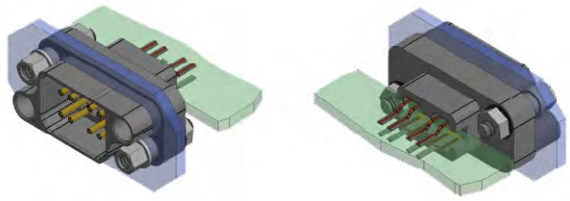
MICROMACH® panel mount connectors

Materials:
- Housing and shield termination: 25.4µm minimum high phosphorus nickel plating on aluminium alloy
- Insert: PEEK
- Contact: 1.27µm gold over 1.27µm nickel plating on copper alloy
- Hardware: Stainless steel

Mechanical:
- Torque screw-nut: 0.35 N.m
- Nuts and washers are included
- Jackpost diameter: 2-56-UNC-2B

MicroMach® Female Edge PCB SMT Panel Mount

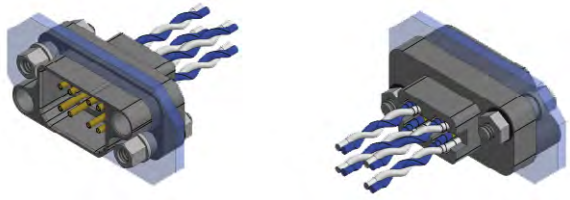
ESCC 3401/095 - VARIANT 01 **(see details page F-24)**



PCB Terminations: Copper alloy, silver plated 2 µm minimum

MicroMach® Female Wired PCB Panel Mount

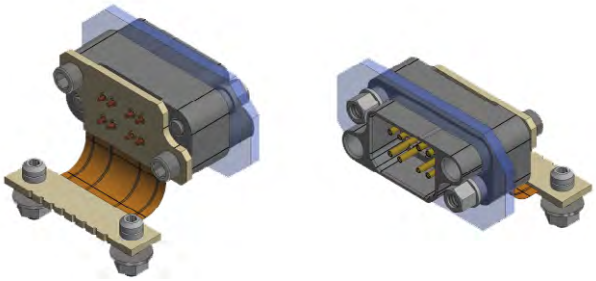
ESCC 3401/095 - VARIANT 02 **(see details page F-24)**



PCB Terminations: Unshielded twisted pair, 100Ω with PTFE dielectric core and silver plated annealed copper center conductor

MicroMach® Female Flex PCB Panel Mount

ESCC 3401/095 - VARIANT 03 **(see details page F-25)**



PCB Terminations: Flexible PCB with Copper / Polyimide coverlays (2 layers with metalized holes) and full ground plane.

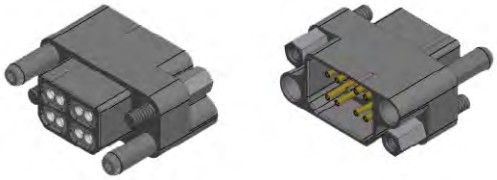
MICROMACH®
connector saver

- EMI seals: conductive silicone based rubber

Materials:
- Housing and shield termination: 25.4µm minimum high phosphorus nickel plating on aluminium alloy
- Insert: PEEK
- Contact: 1.27µm gold over 1.27µm nickel plating on copper alloy
- Hardware: Stainless steel

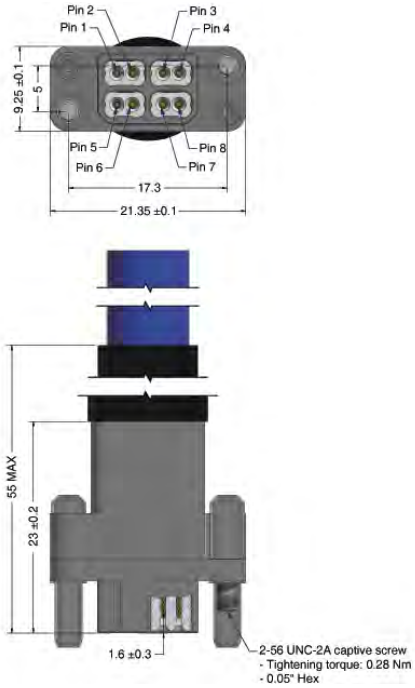
MicroMach® Saver

ESCC 3401/096 - VARIANT 01 **(see details page F-25)**

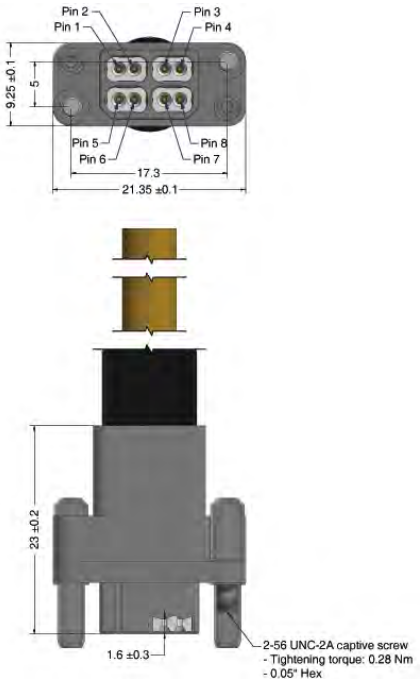


Detailed MICROMACH® connector specifications

MicroMach® AWG26 Male, In-line Plug
ESCC 3409/002 - CONNECTOR CODE 01



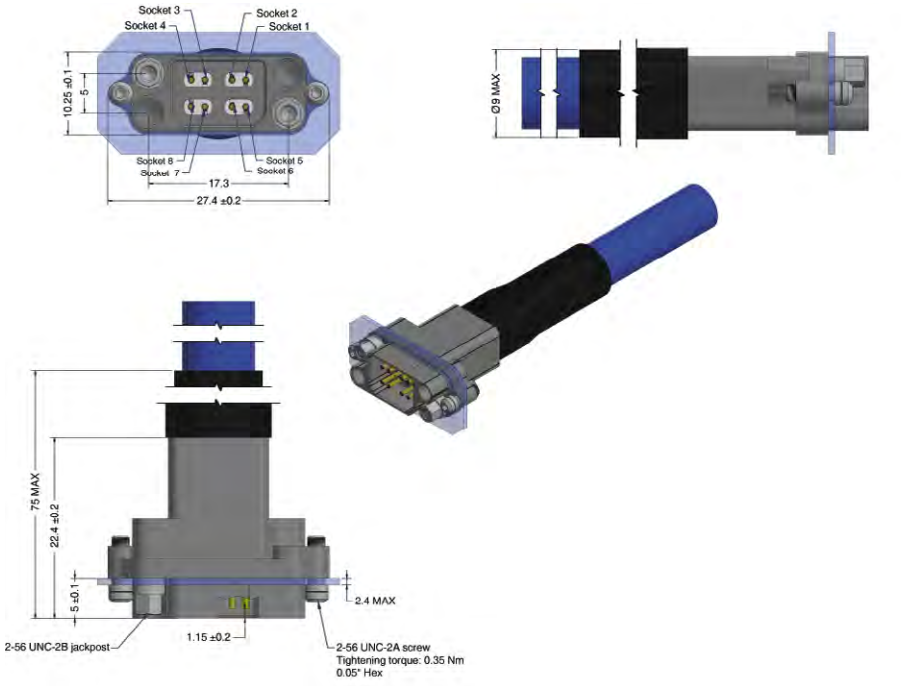
MicroMach® AWG28 Male, In-line Plug
ESCC 3409/002 - CONNECTOR CODE 02



Dimensions in mm. All ESCC specifications are subject to change. Please refer to https://escies.org for latest specifications.

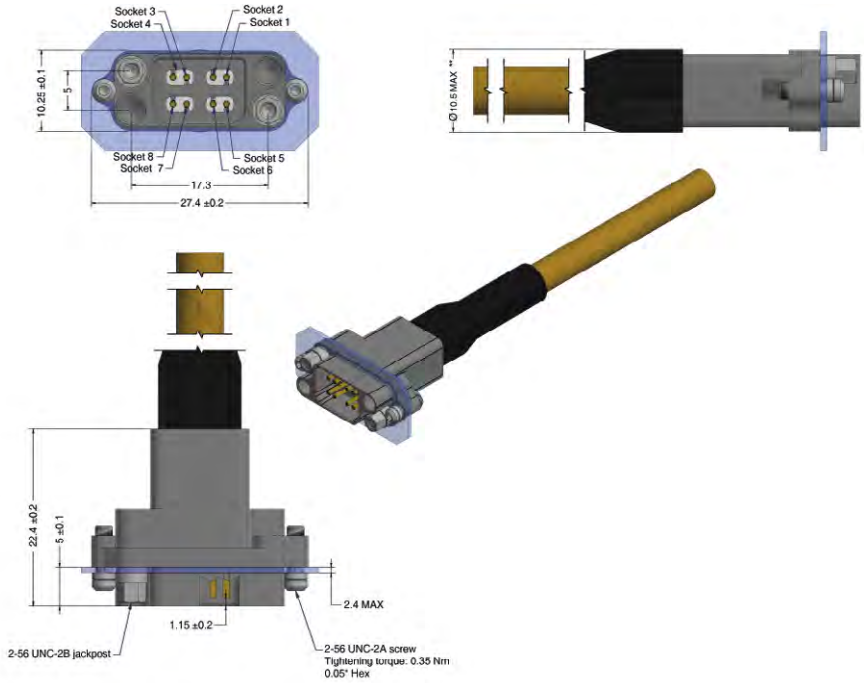
MicroMach® AWG26 Female Panel Mount Jack

ESCC 3409/002 - CONNECTOR CODE 03



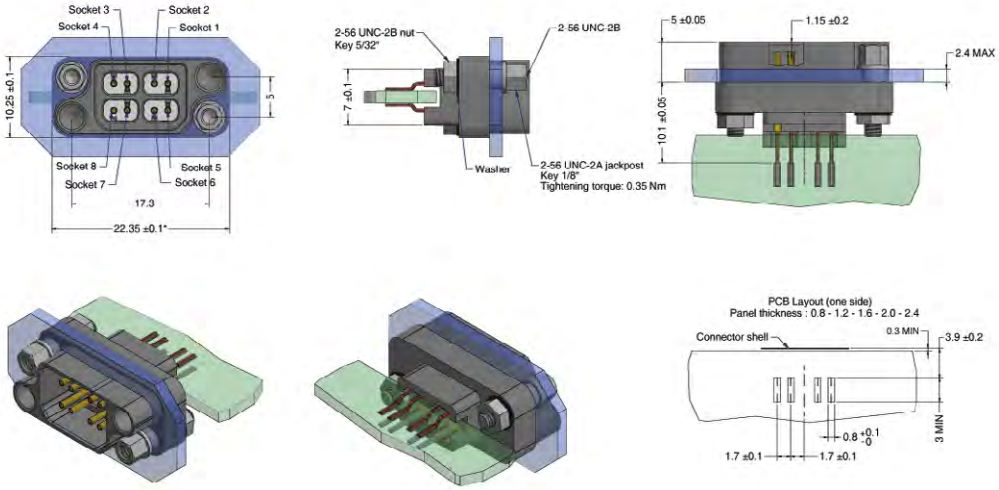
MicroMach® AWG28 Female Panel Mount Jack

ESCC 3409/002 - CONNECTOR CODE 04

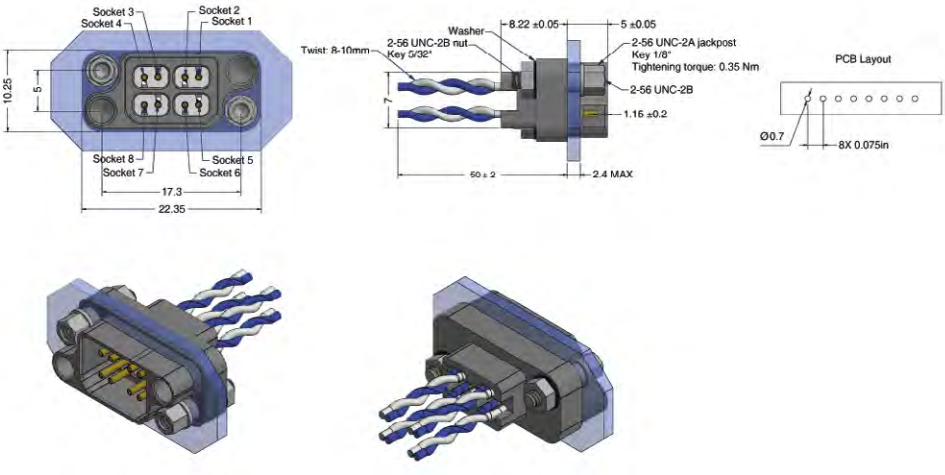


Dimensions in mm. All ESCC specifications are subject to change. Please refer to https://escies.org for latest specifications.

MicroMach® Female Edge PCB SMT Panel Mount
ESCC 3401/095 - VARIANT 01

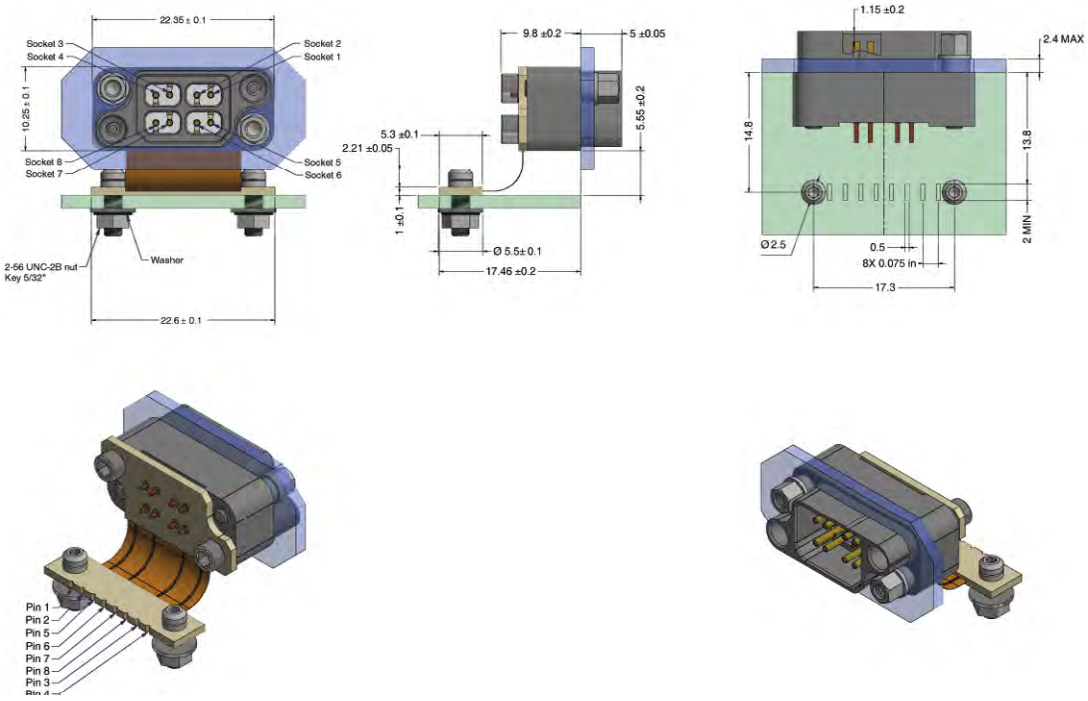


MicroMach® Female Wired PCB Panel Mount
ESCC 3401/095 - VARIANT 02

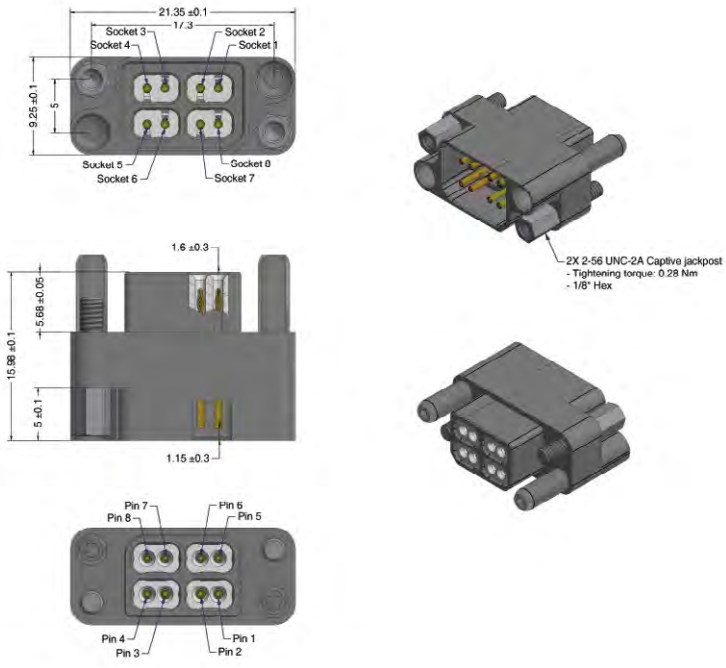


Dimensions in mm. All ESCC specifications are subject to change. Please refer to https://escies.org for latest specifications.

MicroMach® Female Flex PCB Panel Mount
ESCC 3401/095 - VARIANT 03



MicroMach® Saver
ESCC 3401/096 - VARIANT 01



Dimensions in mm. All ESCC specifications are subject to change. Please refer to https://escies.org for latest specifications.

AXOMACH®

For even higher data rates, Axon' offers AxoMach®, a range of very high speed links composed of low loss microwave coaxial cables and different connector types. They are used for standards including SpaceWire, Wizardlink & SpaceFibre.

Faster data transmission

Aimed, for example, at the interconnection of high definition imagery sensors in satellites these links present the following main advantages:

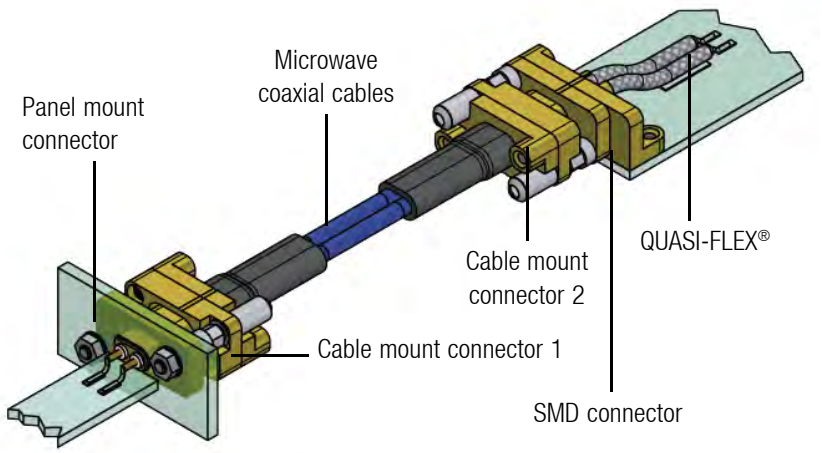
- Transmission of high data rates: 10 Gb/s up to 40 Gb/s,
- Signal integrity: skew < 10 ps per mated pair,
- Low mismatching: differential characteristic impedance 100 Ω (±10 Ω),
- Low crosstalk better than -35 dB at 10 GHz,
- Improved EMC behavior: shielding effectiveness for 1 m link < -60 dB up to 10 GHz,
- Space saving: about half the width of a standard SMA connector for the same number of contacts.

Construction

AXOMACH® high data rate links are made with:

- Microwave coaxial cables
- And different connector types: AXOMACH® inline version, panel mount, SMD or saver connectors as well as SMA panel mount connectors

INLINE FEMALE AXOMACH® CONNECTOR



A procurement specification is available on request. This document following ESCC format details the rating, physical and electrical characteristics, test & inspection data for AXON' space grade high data rate AXOMACH® series connectors and links.

On the following pages each component of this high data rate link will be described in detail.

Microwave coaxial cable

SC25SP

AXON' part number: P840563

Cable suitable for termination to AxoMach® inline connectors, PCB connectors, SMA connectors.

CONDUCTOR

- Silver plated copper (Ag 2µm).
- AWG 2401.
- Area 0.205 mm².
- Resistance: 10 Ω/100 m.

DIELECTRIC

- Extruded CELLOFLON® (expanded PTFE).
- Colour: natural.
- Nominal diameter: 1.51 mm.

SHIELDING

Silver plated copper tape.

SEPARATING TAPE

Polyimide.

SHIELDING

Silver plated copper braid (Ag 2µm).

JACKET

- PFA.
- Colour: blue.

MAIN CHARACTERISTICS

- Nominal outer diameter: 2.50 mm.
- Maximum weight: 17 g/m.
- Nominal impedance: 50 Ω.
- Nominal capacitance: 87 pF/m.
- Temperature rating: -65°C to +150°C.
- Maximum attenuation:
  - 0.70 dB/m at 1 GHz.
  - 1.55 dB/m at 5 GHz.
  - 2.20 dB/m at 10 GHz.
  - 3.05 dB/m at 18 GHz.
- Velocity of propagation: > 76%.

QUASI-FLEX® hand-formable semi-rigid substitute

SH22SW
AXON' part number: P540264
Cable connected to a PCB connector on one side and welded to the equipment PCB on the other side.

CONDUCTOR

- Solid conductor.
- Silver plated copper clad steel (Ag 2µm).
- Nominal diameter: 0.51 mm.

DIELECTRIC

- Extruded PTFE.
- Nominal diameter: 1.65 mm.

SHIELDING

Tin soaked silver plated copper braid (space quality defined by ECSS-Q-10-71 A).

MAIN CHARACTERISTICS

- Nominal outer diameter: 2.15 mm.
- Approximate weight: 17 g/m.
- Impedance: 50 Ω (± 2 Ω).
- Nominal capacitance: 97 pF/m.
- Temperature rating: -55°C to +125°C.
- Maximum attenuation:
  - 0.70 dB/m at 1 GHz.
  - 1.30 dB/m at 3 GHz.
  - 1.85 dB/m at 6 GHz.
  - 2.45 dB/m at 10 GHz.
  - 3.55 dB/m at 18 GHz.
- Velocity of propagation: > 69%.

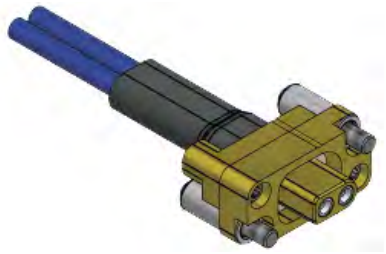
AXOMACH®
cable assemblies

- Special 100 Ω (2 x 50) inserts for the transmission line
- EMI gasket / connector to backshell interface seals: conductive silicone base rubber
- Shrinkable strain relief: fluoropolymer

Materials:
- Body: gold on aluminium alloy
- Dielectric: PTFE
- Pin contact: gold on copper alloy
- Hardware: stainless steel

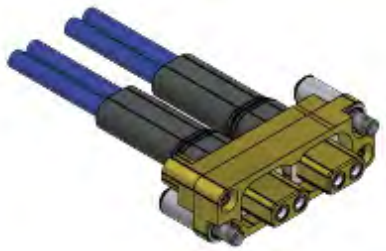
Single way male inline plug

ESCC 3409/001 - CONNECTOR CODE 01 (see details page F-38)



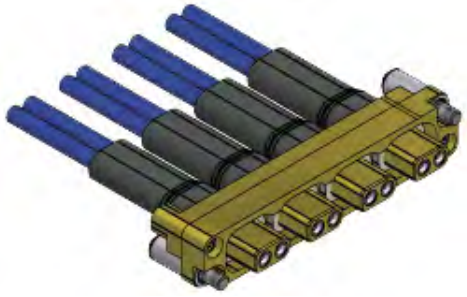
Two way male inline plug

ESCC 3409/001 - CONNECTOR CODE 02 (see details page F-38)



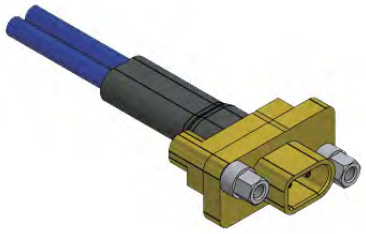
Four way male inline plug

ESCC 3409/001 - CONNECTOR CODE 03 (see details page F-39)



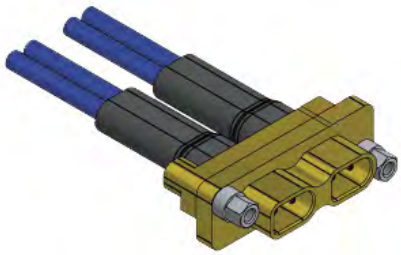
Single way female inline jack

ESCC 3409/001 - CONNECTOR CODE 04 (see details page F-39)



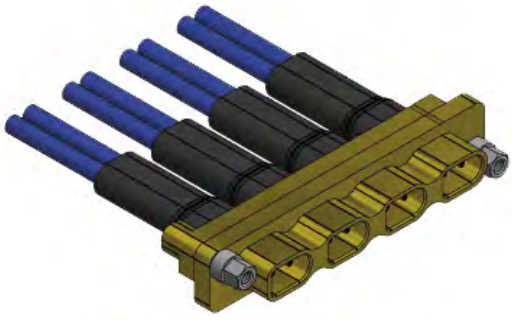
Two way female inline jack

ESCC 3409/001 - CONNECTOR CODE 05 (see details page F-40)



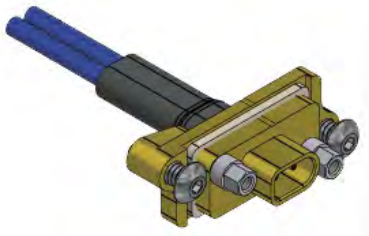
Four way female inline jack

ESCC 3409/001 - CONNECTOR CODE 06 (see details page F-40)



Single way female panel mount jack

ESCC 3409/001 - CONNECTOR CODE 07 (see details page F-41)

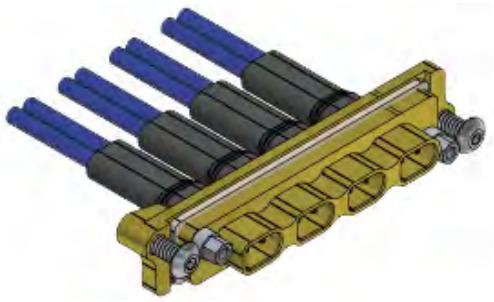


Two way female panel mount jack

ESCC 3409/001 - CONNECTOR CODE 08 (see details page F-41)

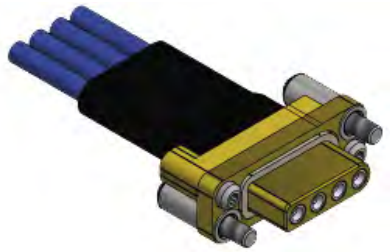
Four way female panel mount jack

ESCC 3409/001 - CONNECTOR CODE 09 (see details page F-42)



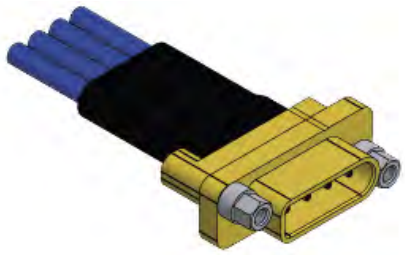
Male inline SpaceFibre plug

ESCC 3409/001 - CONNECTOR CODE 10 (see details page F-42)



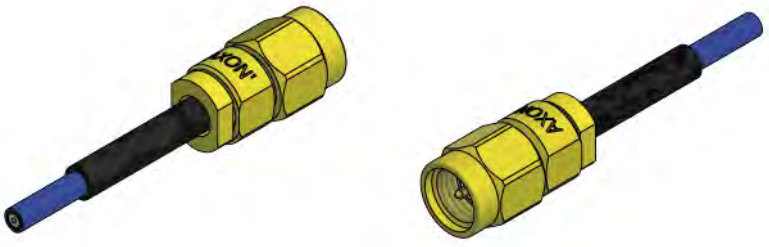
Female inline SpaceFibre jack

ESCC 3409/001 - CONNECTOR CODE 11 (see details page F-43)



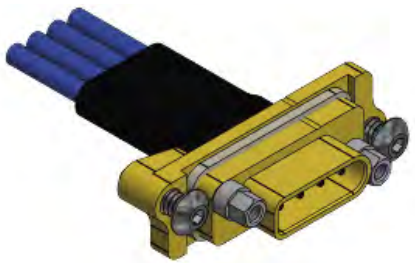
Straight male SMA plug

ESCC 3409/001 - CONNECTOR CODE 17 (see details page F-43)



Female panel mount SpaceFibre jack

ESCC 3409/001 - CONNECTOR CODE 18 (see details page F-44)

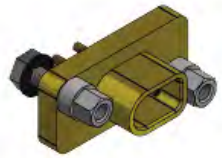


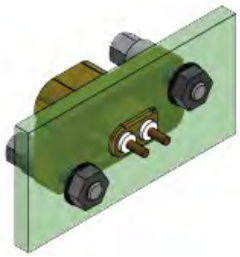
AXOMACH® panel mount & SMD connectors

Materials:
- Body: gold on aluminium alloy
- Dielectric: PTFE
- Mated contact: gold on copper alloy
- Hardware: stainless steel

Single way female panel mount jack

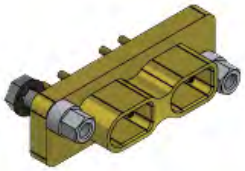
ESCC 3401/089 - VARIANT 01 (see details page F-45)

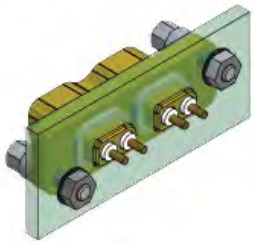




Two way female panel mount jack

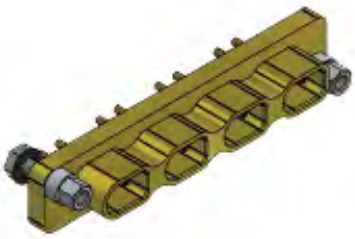
ESCC 3401/089 - VARIANT 02 (see details page F-45)

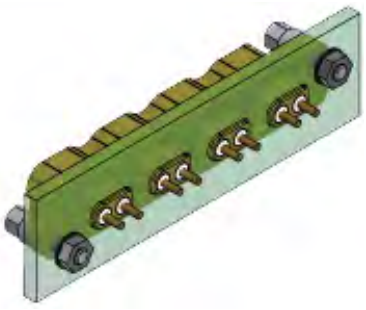




Four way female panel mount jack

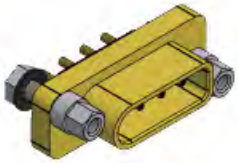
ESCC 3401/089 - VARIANT 03 (see details page F-46)

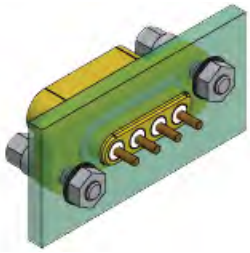




Female panel mount SpaceFibre jack

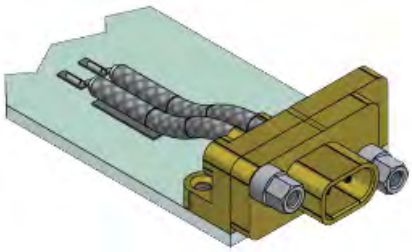
ESCC 3401/089 - VARIANT 04 (see details page F-46)





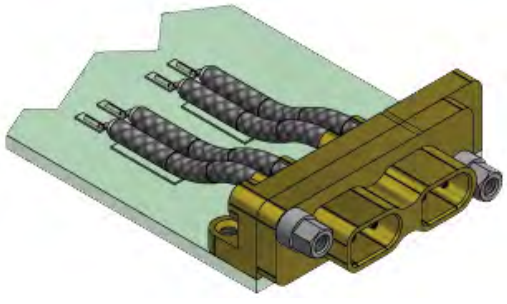
Single way female SMD jack

ESCC 3401/089 - VARIANT 05 (see details page F-47)



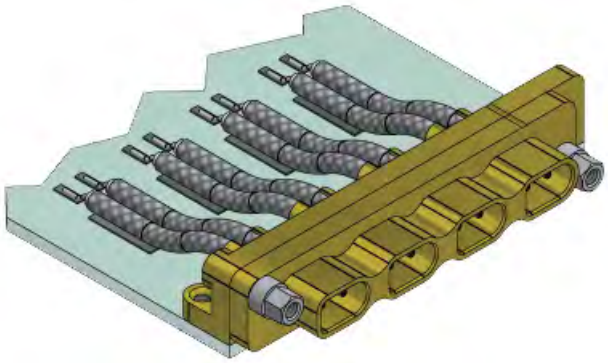
Two way female SMD jack

ESCC 3401/089 - VARIANT 06 (see details page F-47)



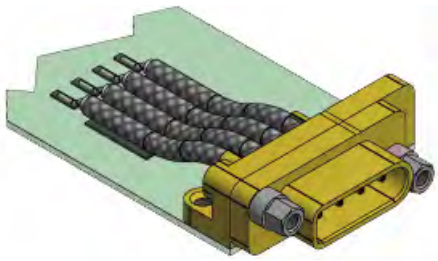
Four way female SMD jack

ESCC 3401/089 - VARIANT 07 (see details page F-48)



Female SMD SpaceFibre jack

ESCC 3401/089 - VARIANT 08 (see details page F-48)

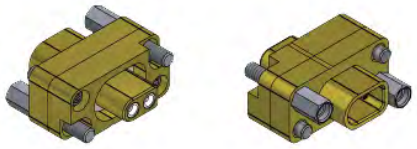


AXOMACH® savers

Materials:
- Body: gold on aluminium alloy
- Dielectric: PTFE
- Mated contact: gold on copper alloy
- Hardware: stainless steel

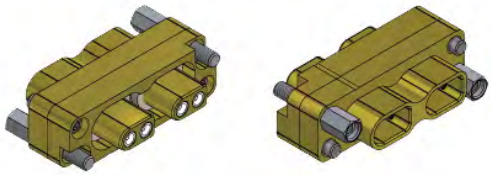
Single way connector saver

ESCC 3401/090 - VARIANT 01 (see details page F-49)



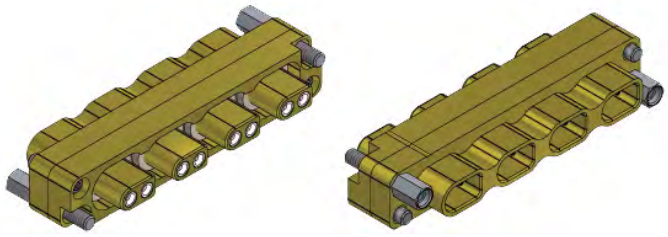
Two way connector saver

ESCC 3401/090 - VARIANT 02 (see details page F-49)



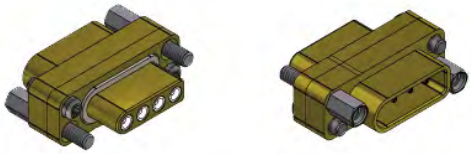
Four way connector saver

ESCC 3401/090 - VARIANT 03 (see details page F-50)



SpaceFibre connector saver

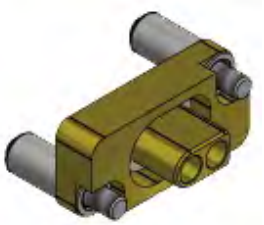
ESCC 3401/090 - VARIANT 07 (see details page F-52)



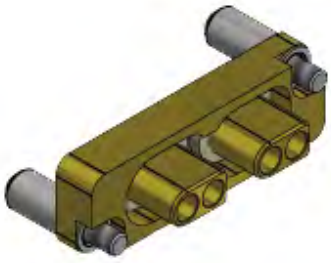
AXOMACH®
blanking plates

Materials:
- Body: gold on aluminium alloy
- Dielectric: PTFE
- Mated contact: gold on copper alloy
- Hardware: stainless steel

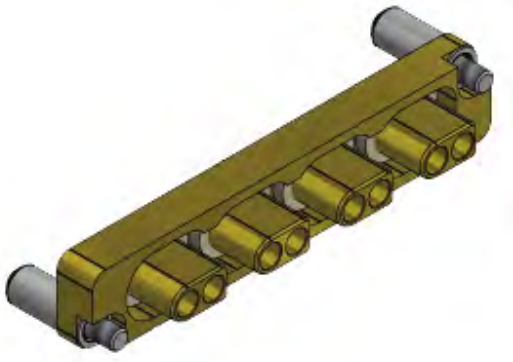
Blanking plate for single way connectors
ESCC 3401/090 - VARIANT 04 (see details page F-50)



Blanking plate for two way connectors
ESCC 3401/090 - VARIANT 05 (see details page F-51)

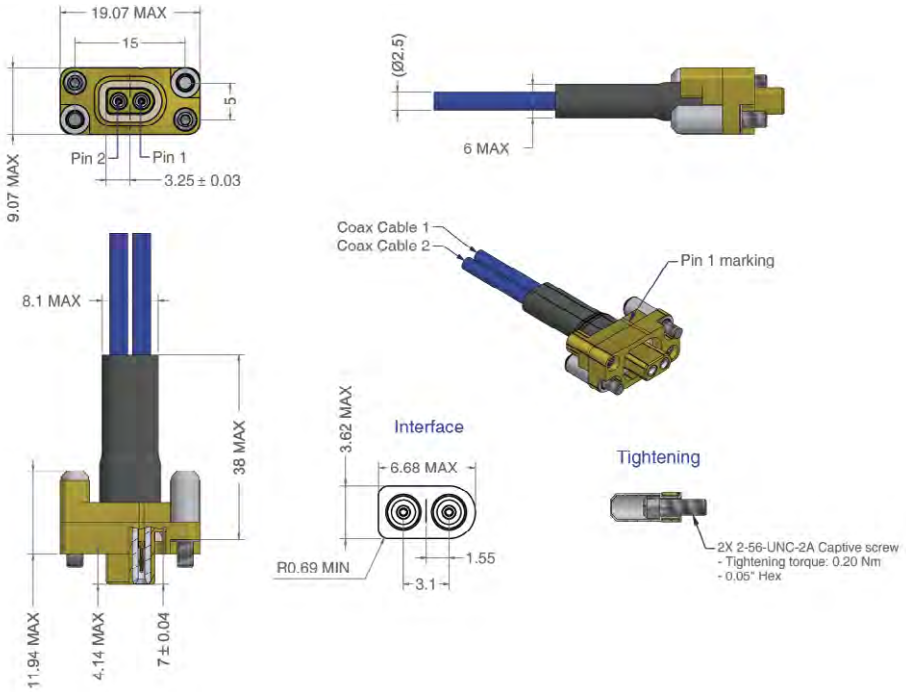


Blanking plate for four way connectors
ESCC 3401/090 - VARIANT 06 (see details page F-51)

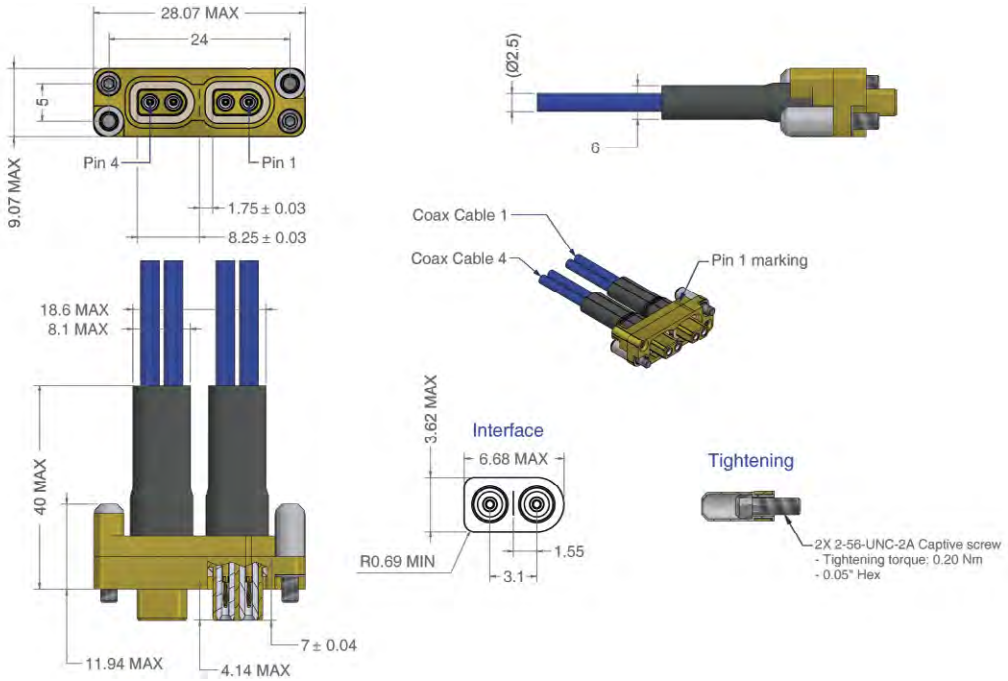


Detailed AXOMACH® connector specifications

Single way male inline plug
ESCC 3409/001 - CONNECTOR CODE 01

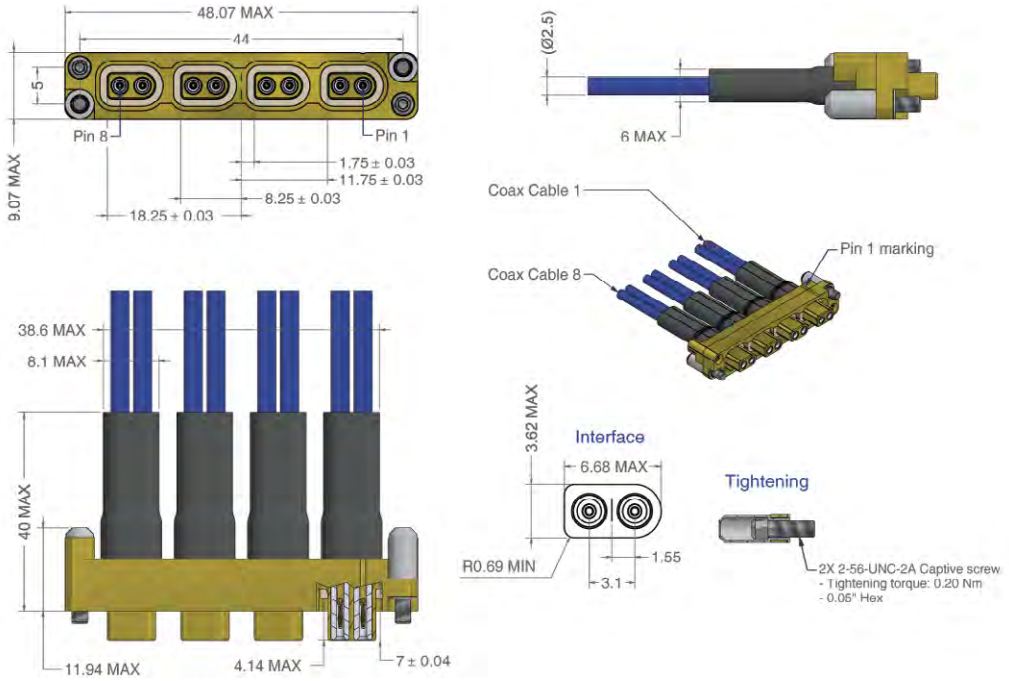


Two way male inline plug
ESCC 3409/001 - CONNECTOR CODE 02

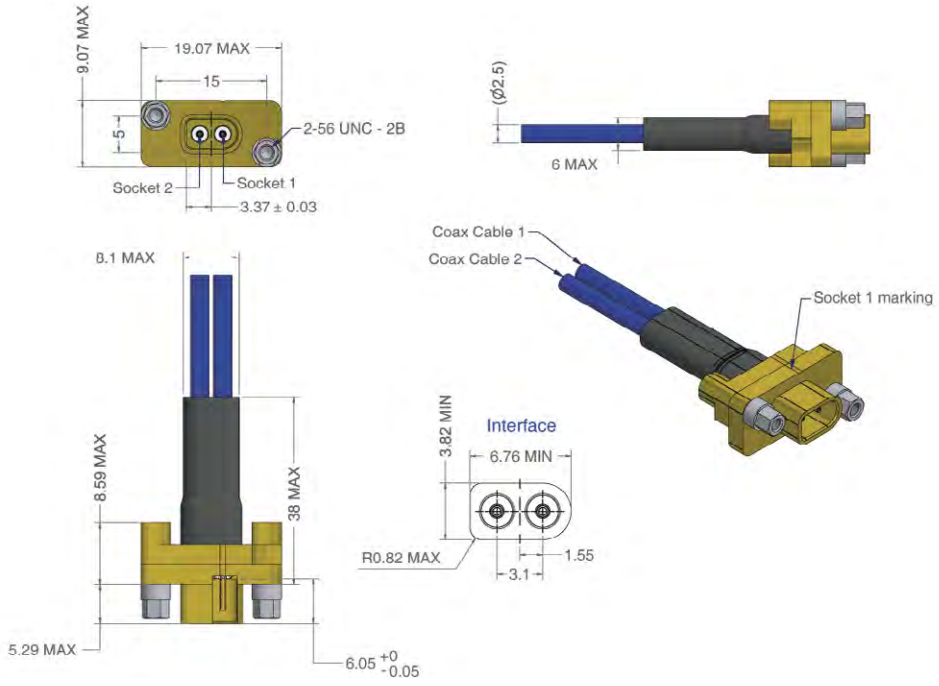


Dimensions in mm. All ESCC specifications are subject to change. Please refer to https://escies.org for latest specifications.

Four way male inline plug
ESCC 3409/001 - CONNECTOR CODE 03

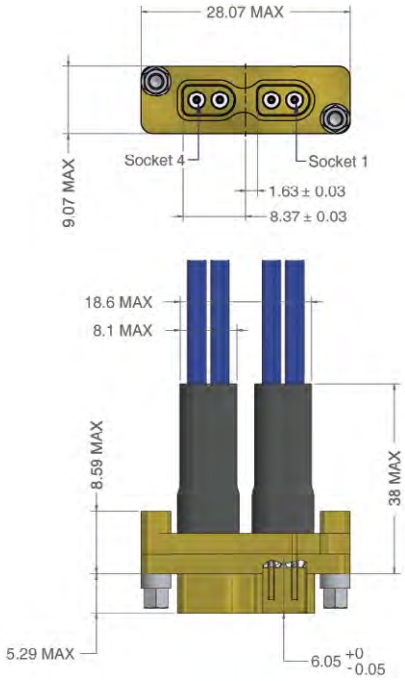


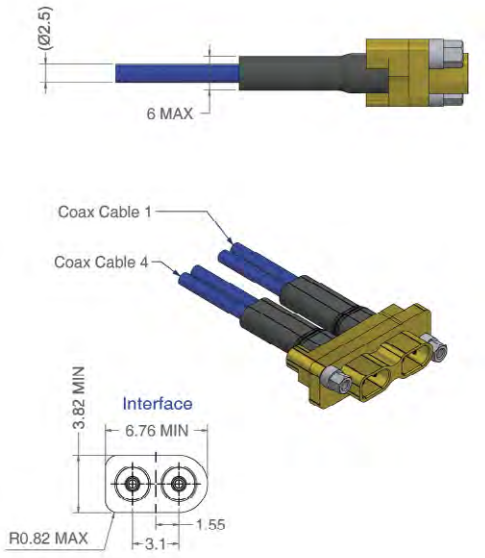
Single way female inline jack
ESCC 3409/001 - CONNECTOR CODE 04



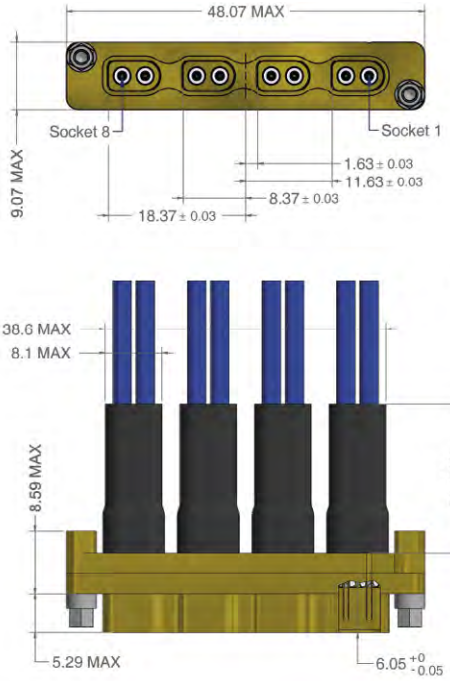
Dimensions in mm. All ESCC specifications are subject to change. Please refer to https://escies.org for latest specifications.

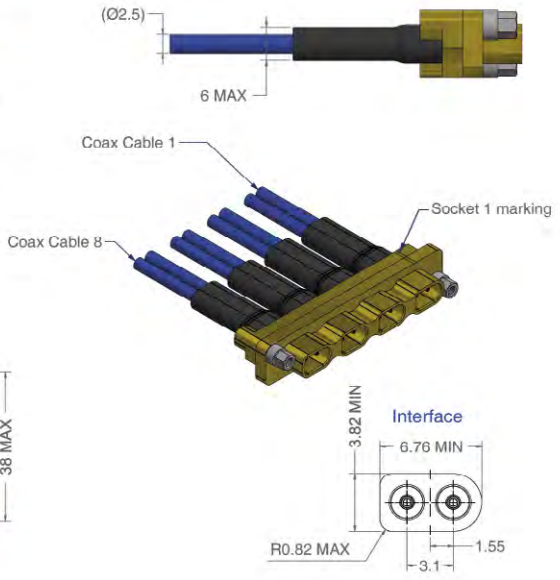
Two way female inline jack
ESCC 3409/001 - CONNECTOR CODE 05





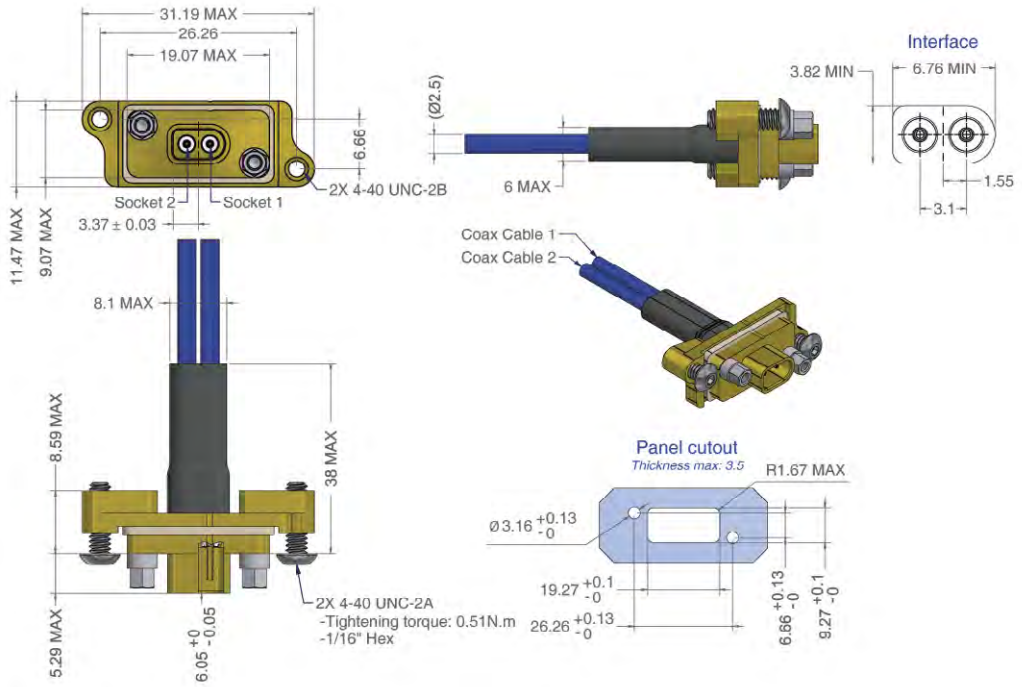
Four way female inline jack
ESCC 3409/001 - CONNECTOR CODE 06



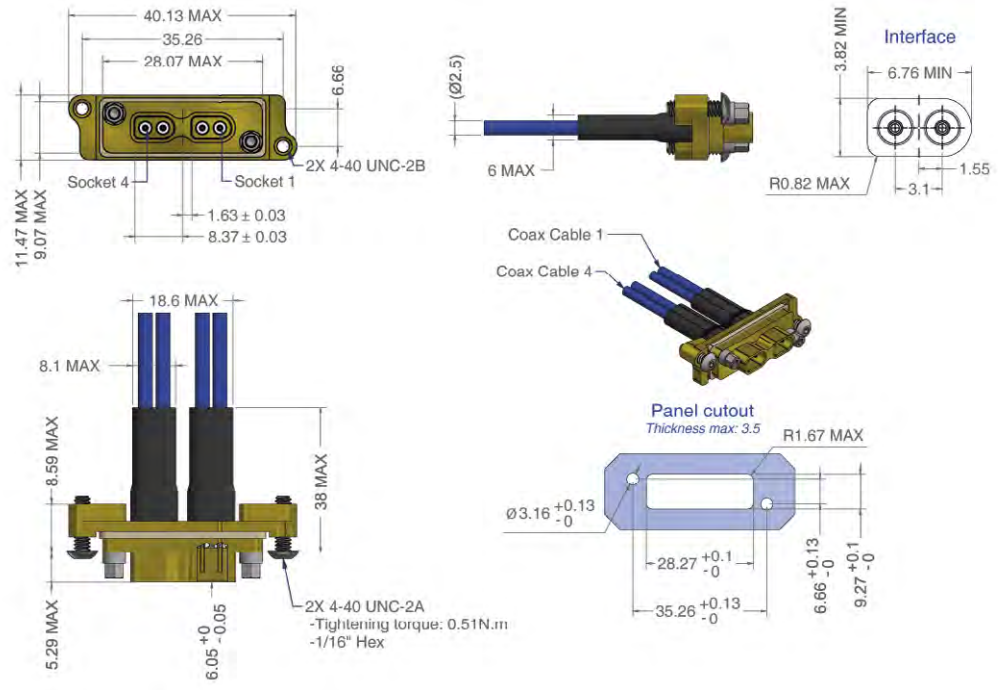


Dimensions in mm. All ESCC specifications are subject to change. Please refer to https://escies.org for latest specifications.

Single way female panel mount jack
ESCC 3409/001 - CONNECTOR CODE 07

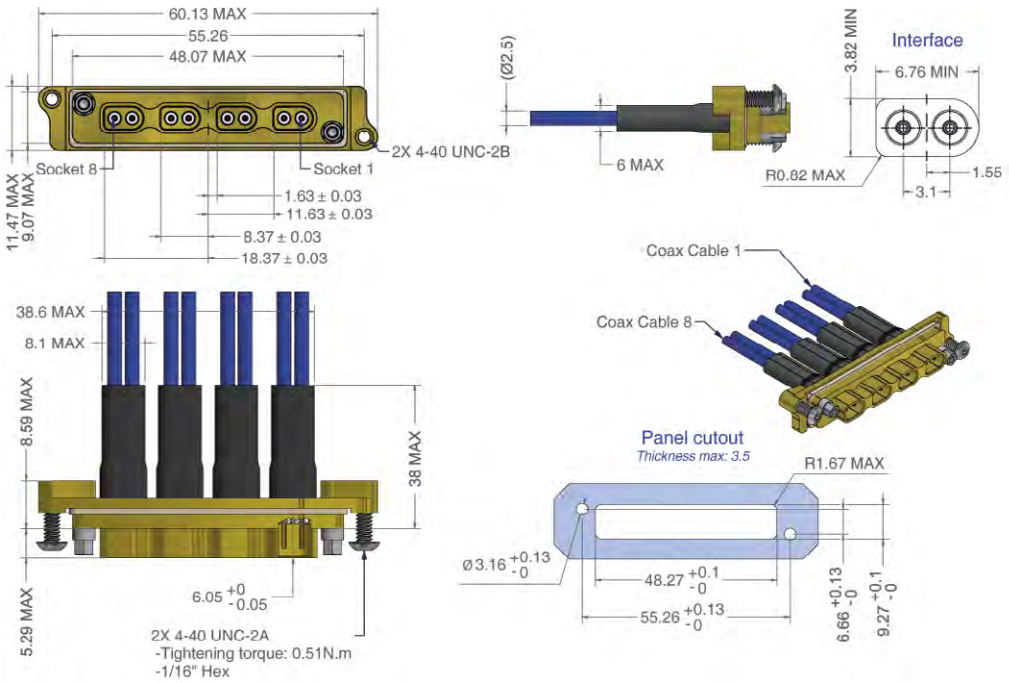


Two way female panel mount jack
ESCC 3409/001 - CONNECTOR CODE 08

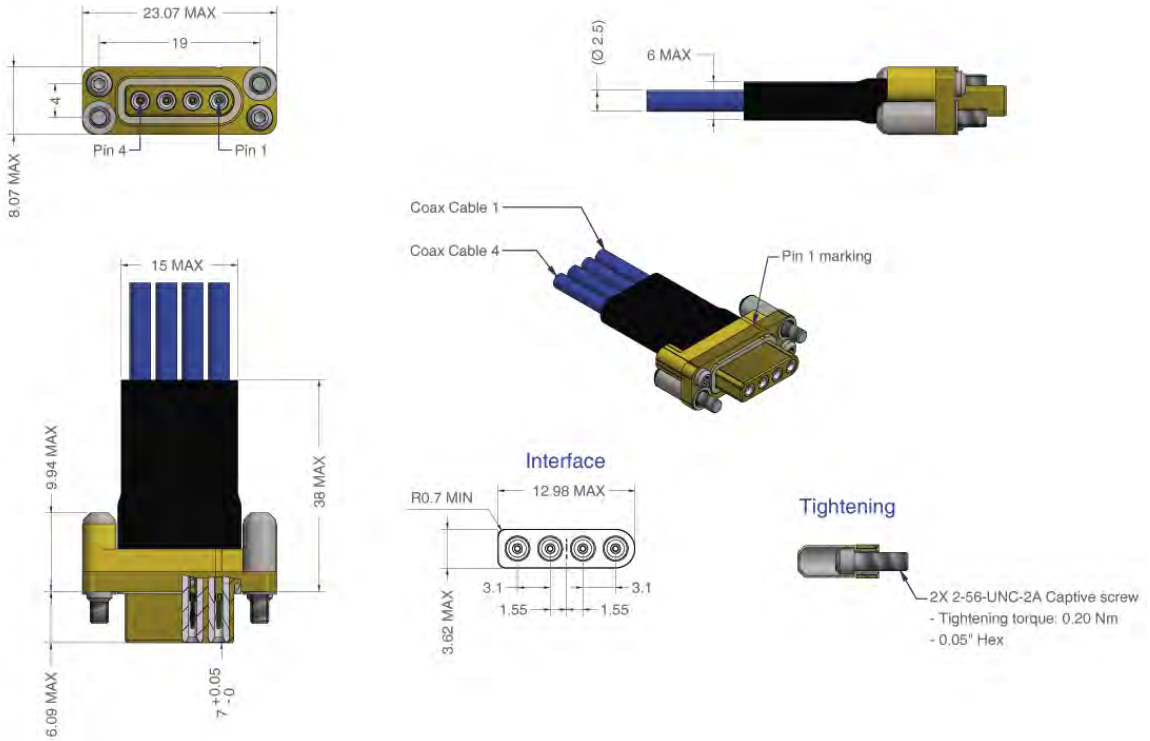


Dimensions in mm. All ESCC specifications are subject to change. Please refer to https://escies.org for latest specifications.

Four way female panel mount jack
ESCC 3409/001 - CONNECTO CODE 09

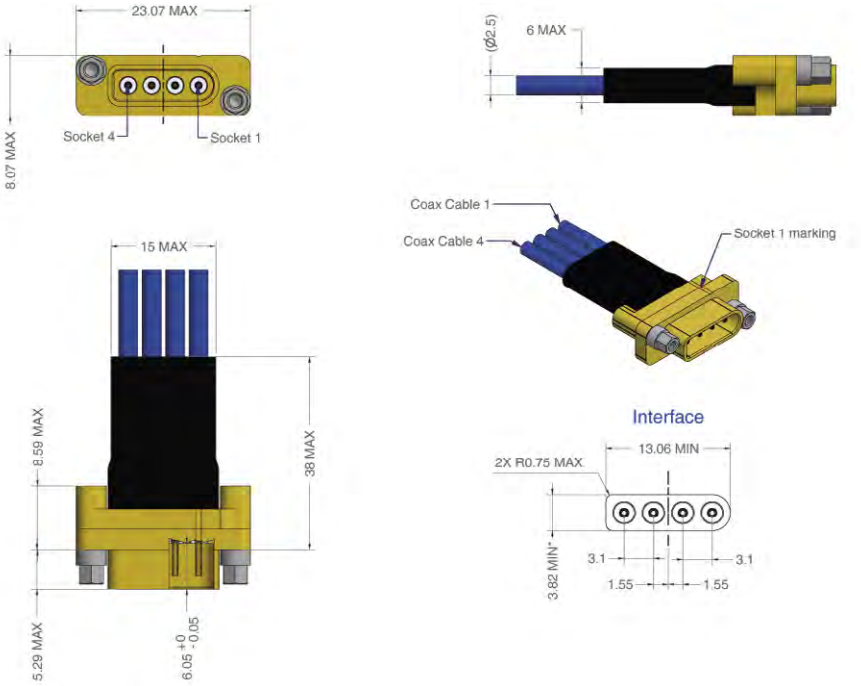


Male inline SpaceFibre plug
ESCC 3409/001 - CONNECTOR CODE 10

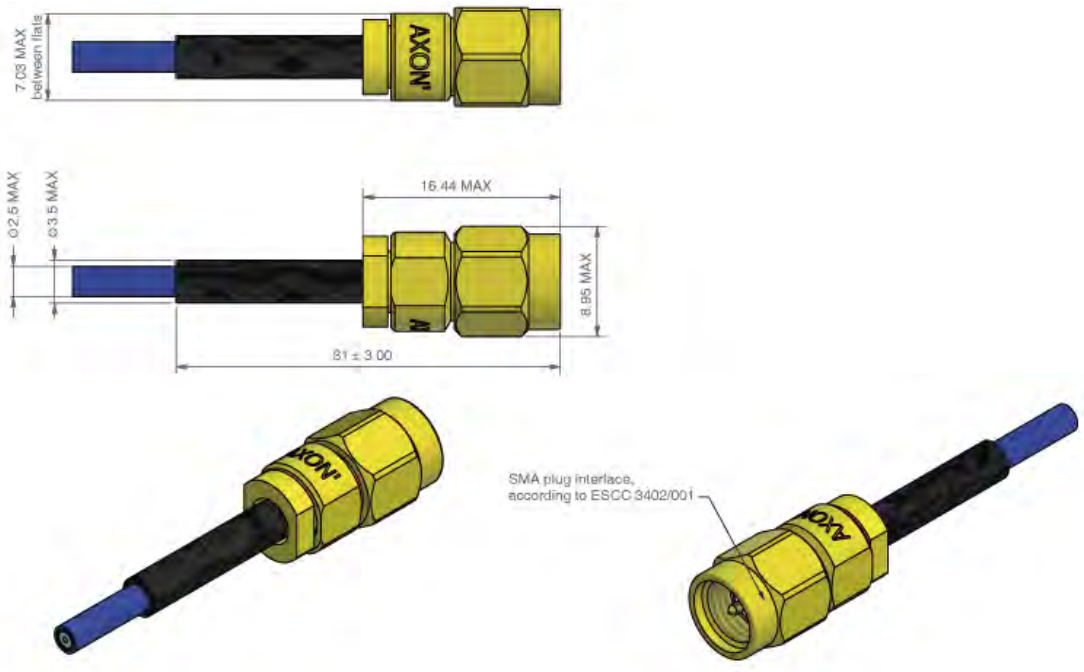


Dimensions in mm. All ESCC specifications are subject to change. Please refer to https://escies.org for latest specifications.

Female inline SpaceFibre jack
ESCC 3409/001 - CONNECTOR CODE 11

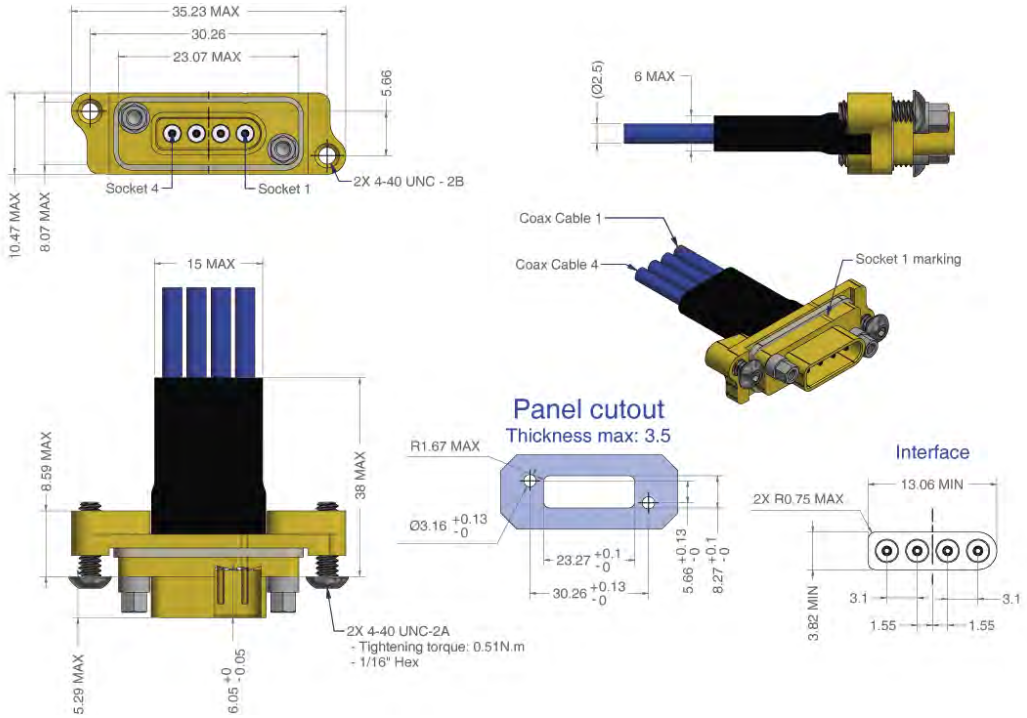


Straight male SMA plug
ESCC 3409/001 - CONNECTOR CODE 17



Dimensions in mm. All ESCC specifications are subject to change. Please refer to https://escies.org for latest specifications.

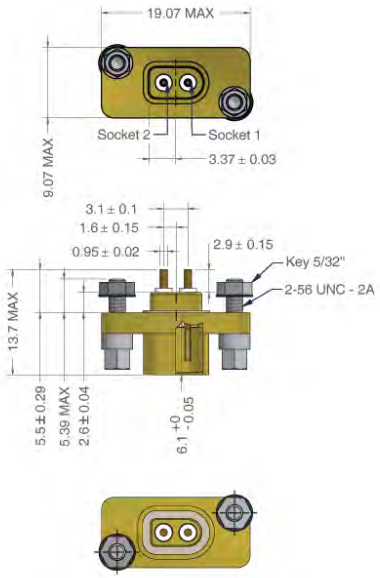
Female panel mount SpaceFibre jack
ESCC 3409/001 - CONNECTOR CODE 18

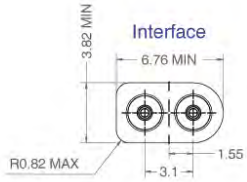


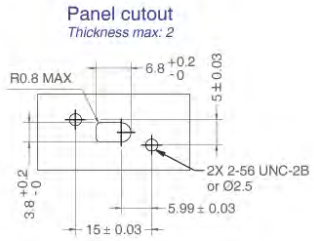
Dimensions in mm. All ESCC specifications are subject to change. Please refer to https://escies.org for latest specifications.

AXOMACH® panel mount & SMD connector specifications

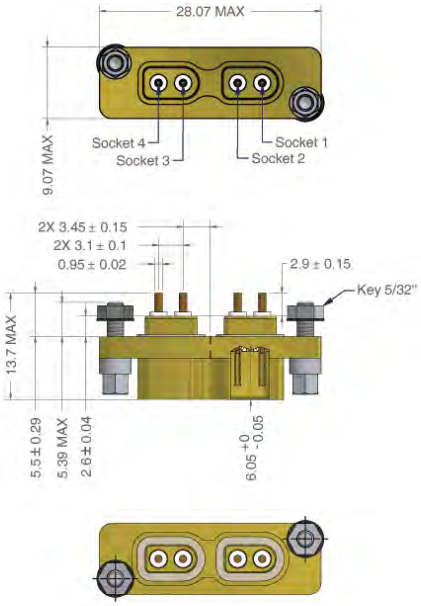
Single way female panel mount connector
ESCC 3401/089 - VARIANT 01

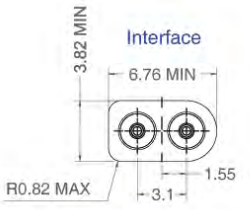


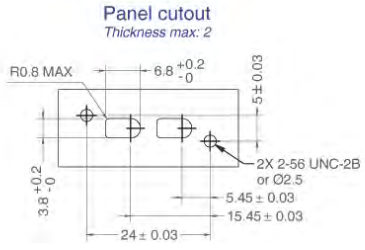




Two way female panel mount connector
ESCC 3401/089 - VARIANT 02

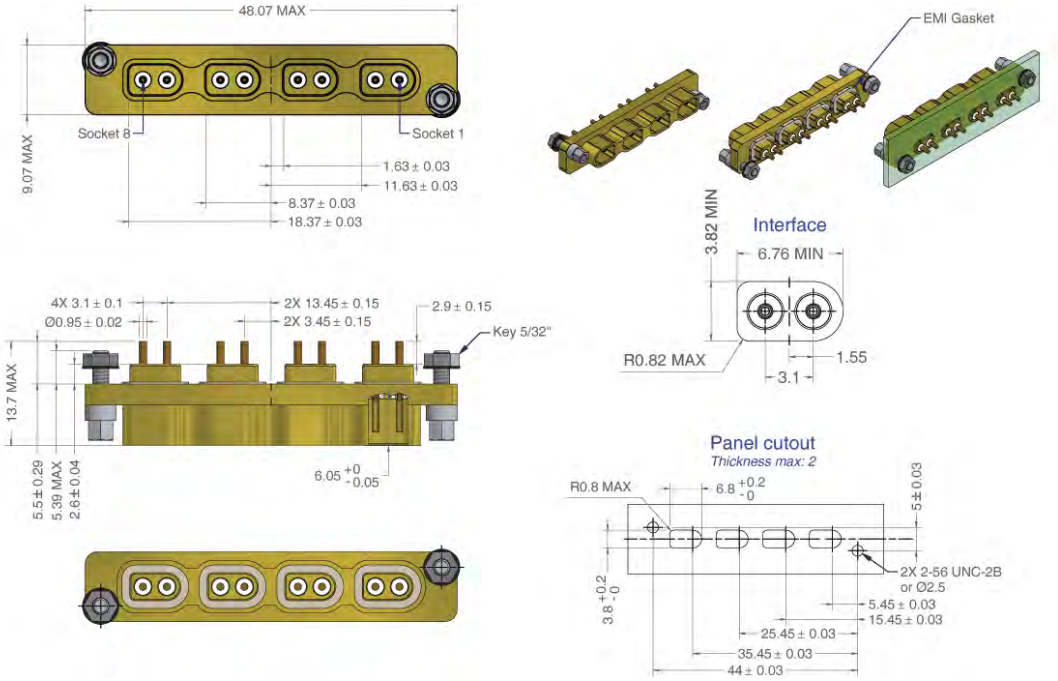




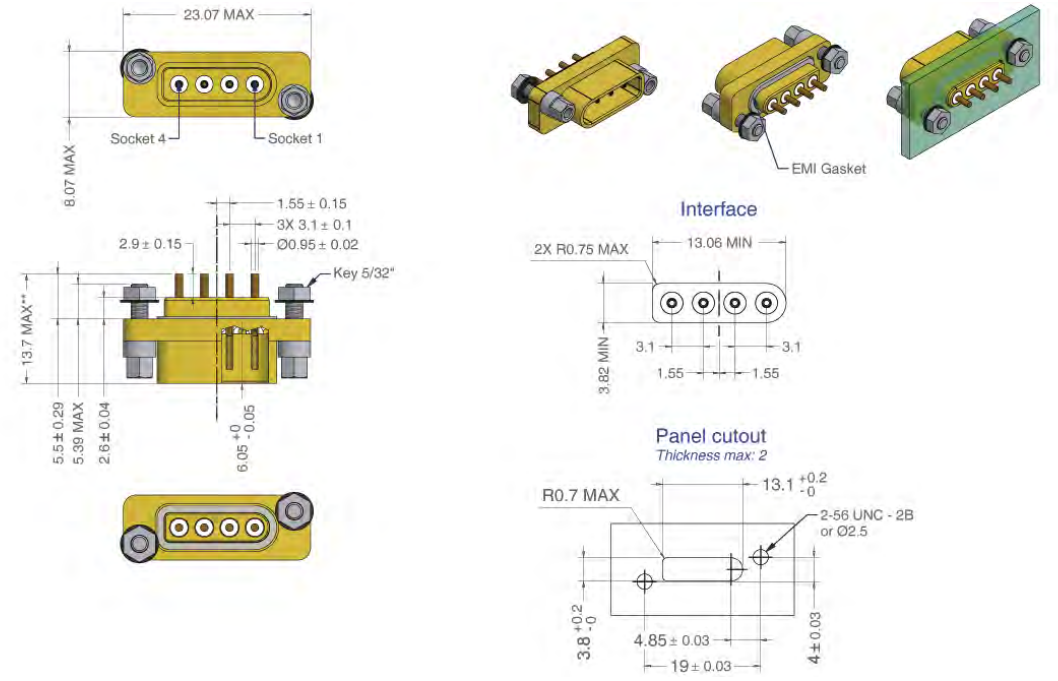


Dimensions in mm. All ESCC specifications are subject to change. Please refer to https://escies.org for latest specifications.

Four way female panel mount connector
ESCC 3401/089 - VARIANT 03

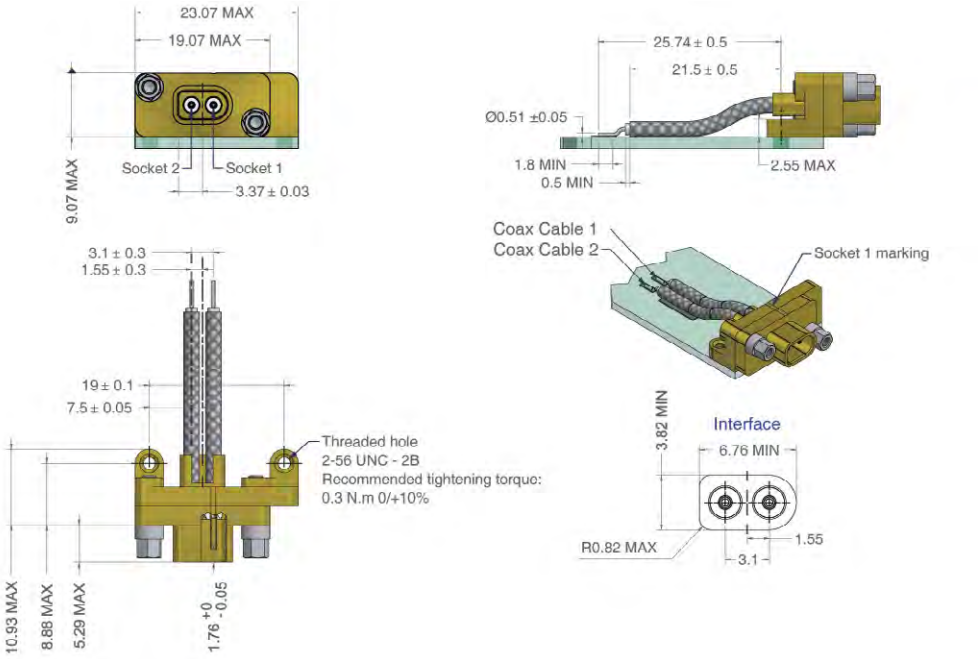


Female panel mount SpaceFibre connector
ESCC 3401/089 - VARIANT 04

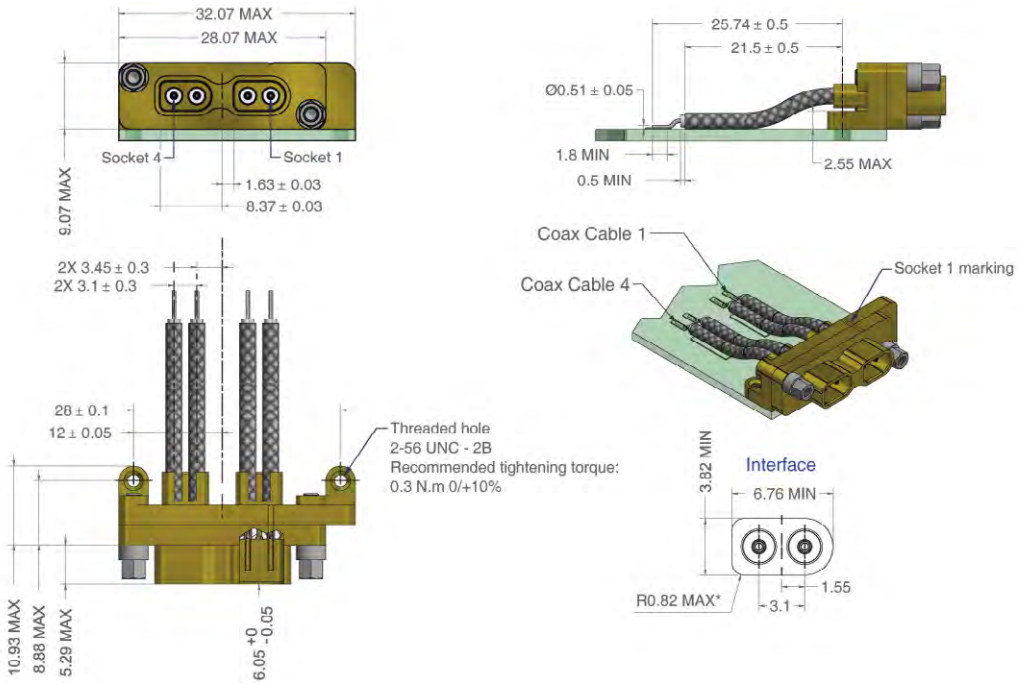


Dimensions in mm. All ESCC specifications are subject to change. Please refer to https://escies.org for latest specifications.

Single way female SMD connector
ESCC 3401/089 - VARIANT 05

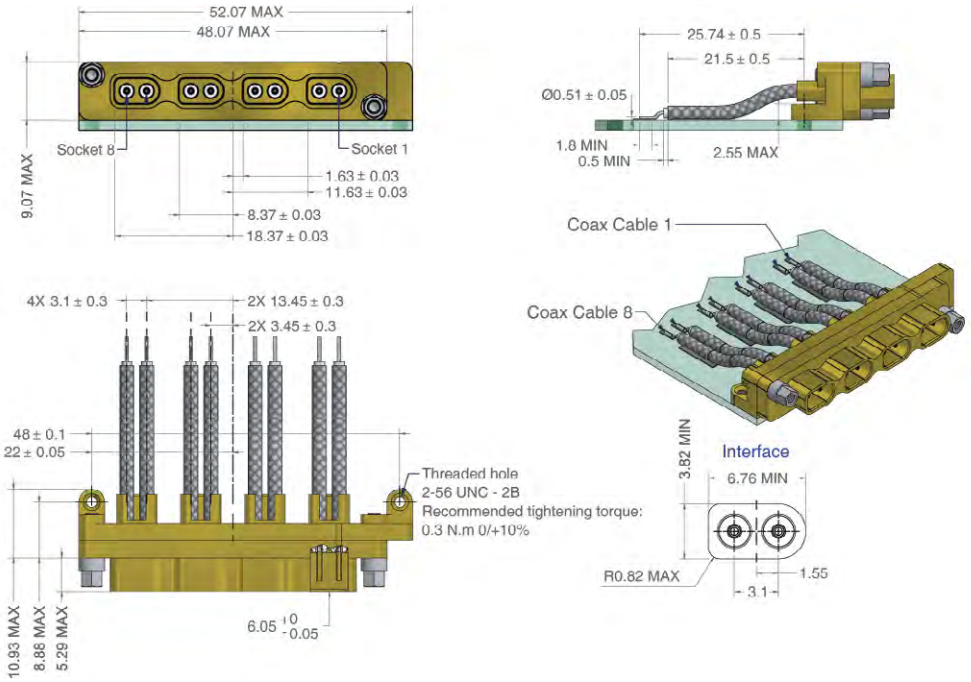


Two way female SMD connector
ESCC 3401/089 - VARIANT 06

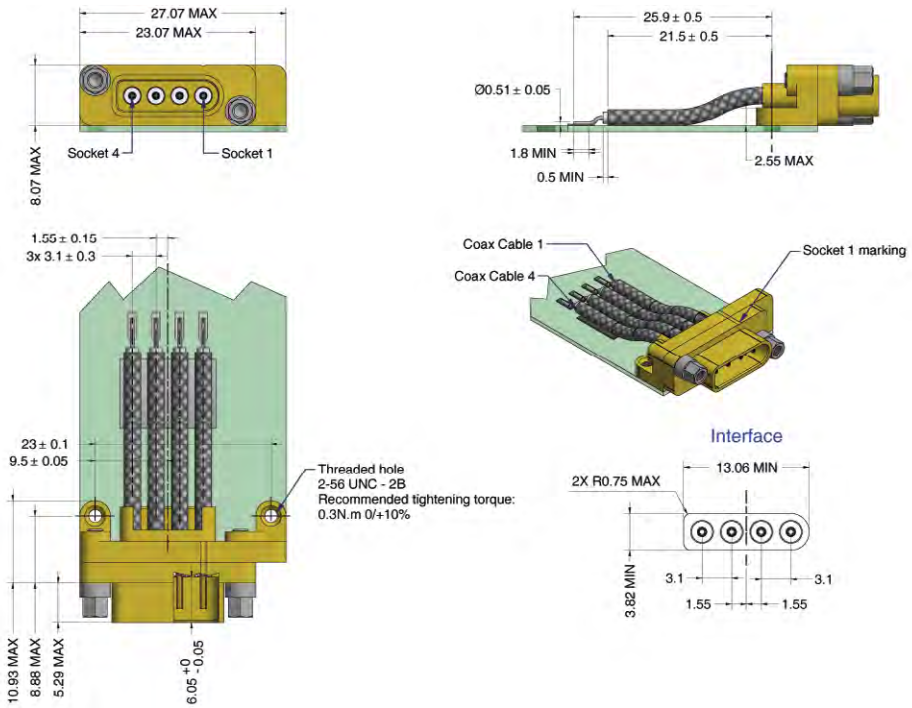


Dimensions in mm. All ESCC specifications are subject to change. Please refer to https://escies.org for latest specifications.

Four way female SMD connector
ESCC 3401/089 - VARIANT 07



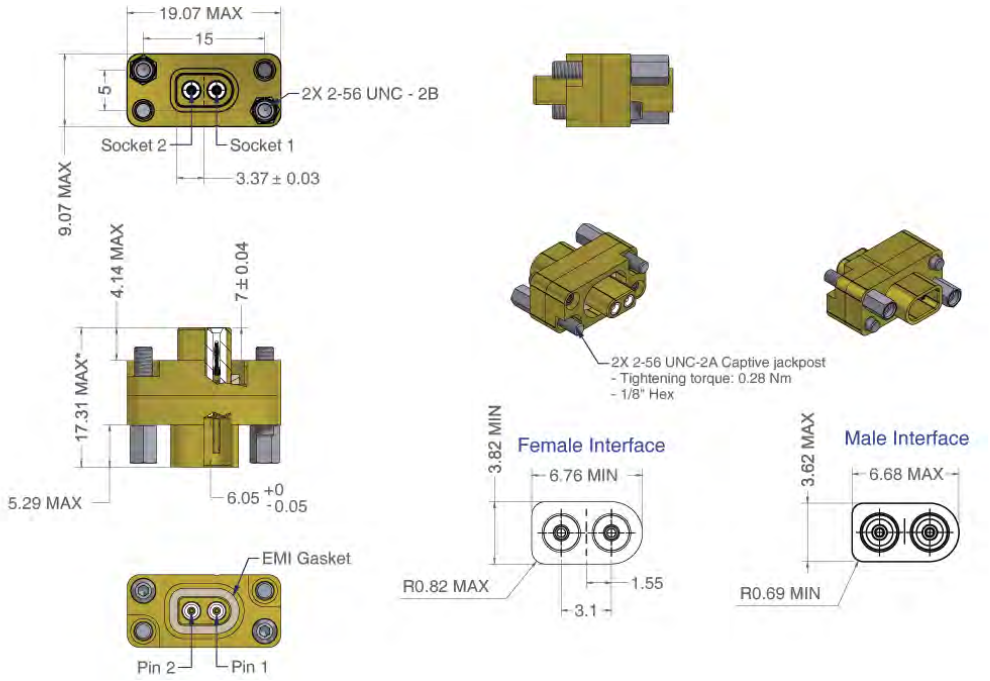
Female SMD SpaceFibre connector
ESCC 3401/089 - VARIANT 08



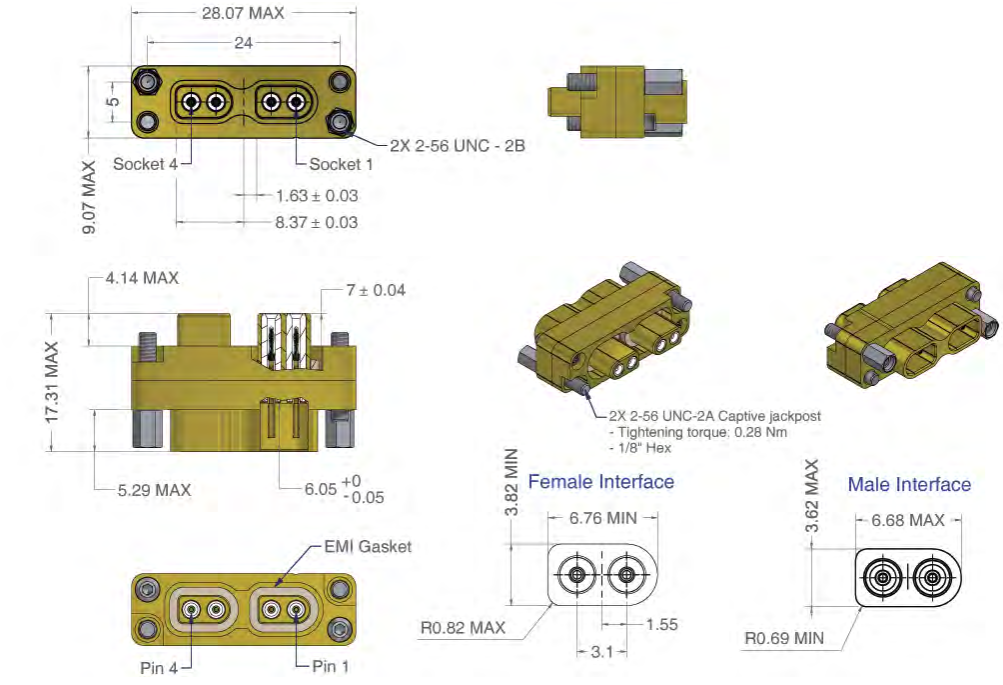
Dimensions in mm. All ESCC specifications are subject to change. Please refer to https://escies.org for latest specifications.

Detailed AXOMACH® accessory specifications

Single way connector saver
ESCC 3401/090 - VARIANT 01

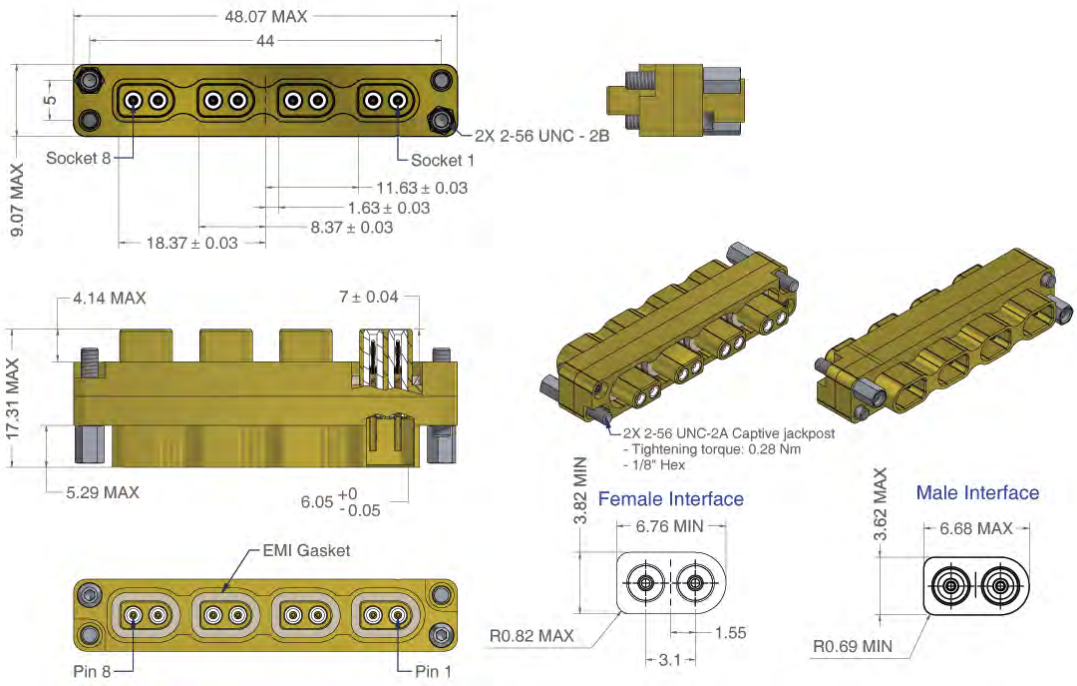


Two way connector saver
ESCC 3401/090 - VARIANT 02

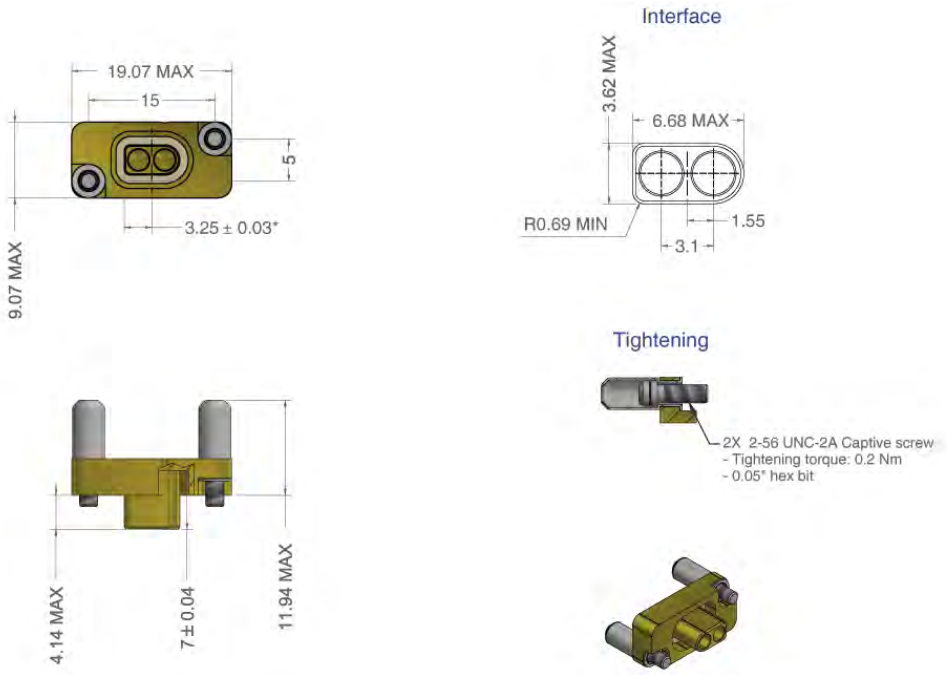


Dimensions in mm. All ESCC specifications are subject to change. Please refer to https://escies.org for latest specifications.

Four way connector saver
ESCC 3401/090 - VARIANT 03

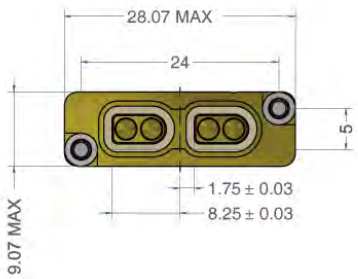


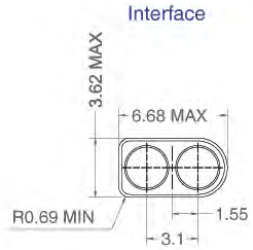
Blanking plate for single way connectors
ESCC 3401/090 - VARIANT 04

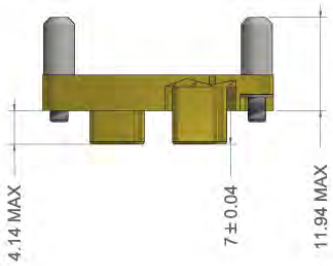


Dimensions in mm. All ESCC specifications are subject to change. Please refer to https://escies.org for latest specifications.

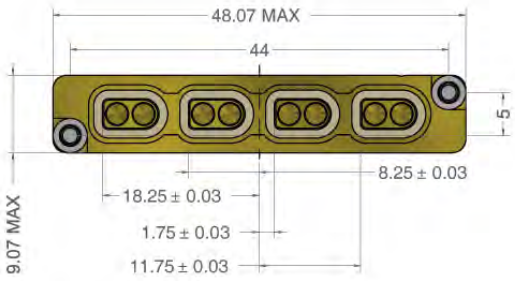
Blanking plate for two way connectors
ESCC 3401/090 - VARIANT 05

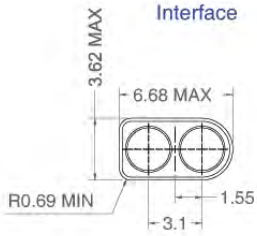


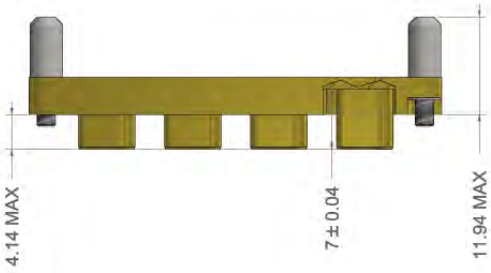


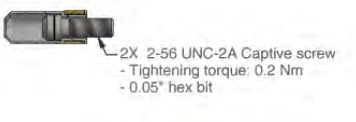


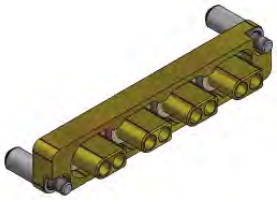
Blanking plate for four way connectors
ESCC 3401/090 - VARIANT 06





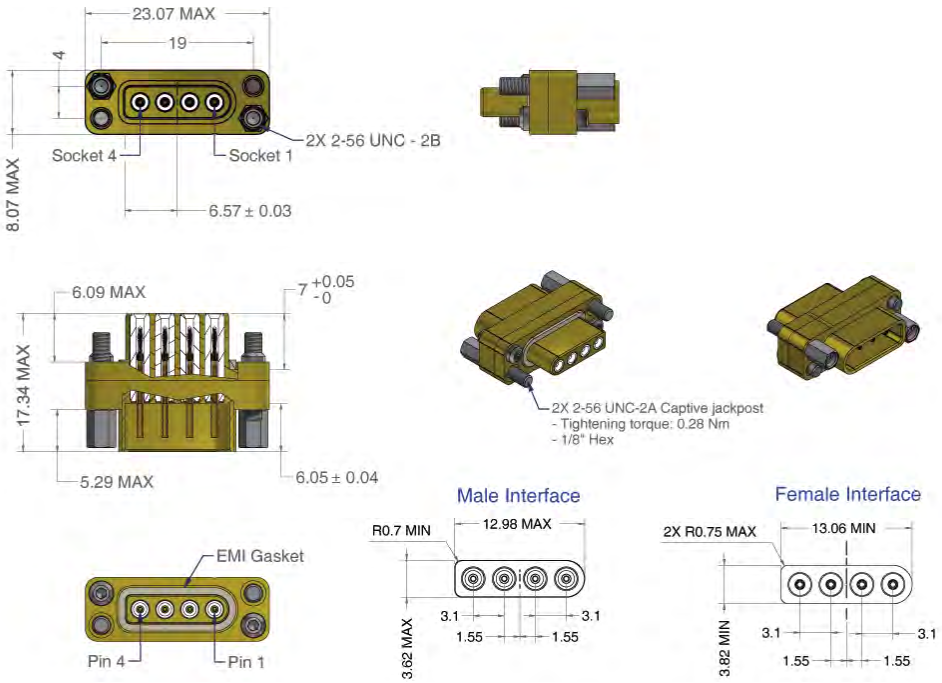






Dimensions in mm. All ESCC specifications are subject to change. Please refer to https://escies.org for latest specifications.

SpaceFibre connector saver
ESCC 3401/090 - VARIANT 07



Dimensions in mm. All ESCC specifications are subject to change. Please refer to https://escies.org for latest specifications.

SMA connectors (ESCC3402 QPL)

To connect AXOMACH® links to your devices equipped with SMA plugs or to create panel feedthroughs, AXON' proposes the following ESA qualified SMA connectors:

ESCC VARIANT	TECHNICAL CONFIGURATION
ESCC 3402/001 variant 01	Straight plug, solder type, for semi-rigid cable Ø 2.2 mm.
ESCC 3402/001 variant 09	Right angle plug, solder type, for semi-rigid cable Ø 2.2 mm.
ESCC 3402/002 variant 01	Straight jack, solder type, for semi-rigid cable Ø 2.2 mm.
ESCC 3402/002 variant 09	Straight jack, solder type, rear mounting, 2 holes, flange mounted, for semi-rigid cable Ø 2.2 mm.
ESCC 3402/002 variant 68	Straight jack, solder type, rear mounting, flange mounted, for semi-rigid cable Ø 2.2 mm.
ESCC 3402/003 variant 07	Hermetic adaptor, female-female.
ESCC 3402/003 variant 14	Straight bulkhead adaptor, female-female.

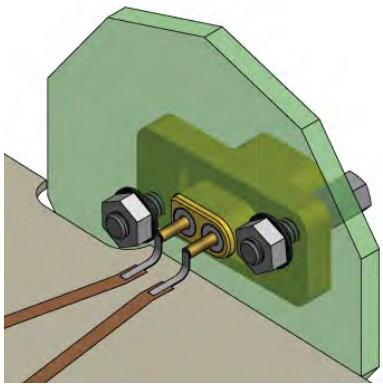
This list is non exhaustive.

Termination of the connectors

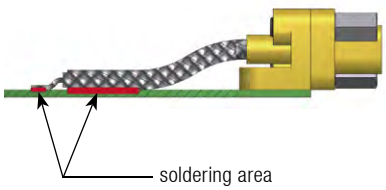
AXOMACH® panel mount connectors
This connector can be terminated to a PCB using flat flexible conductors in order to be mechanically decoupled between the PCB and the panel where the connector is mounted. One end of the flat conductor is soldered to the connector lead using high temperature solder or a parallel gap weld procedure. The other end is soldered on PCB tracks by using standard soldering.
This termination must be validated and approved depending on the mission environment.

AXOMACH® cable mount connectors and surface mount connectors
- Inner conductor is crimped to gold plated copper alloy contacts.
- Cable shield is soldered into the backshell using soft soldering.
- X-Ray inspection is performed on all link terminations.

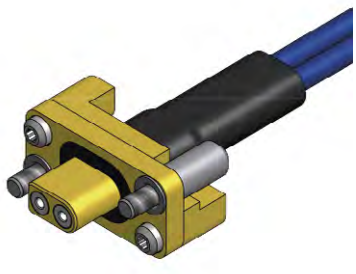
Transmission measurements are performed on 100% of manufactured links up to 10 Gb/s. The manufacturing and control procedures are maintained in a PID followed by CNES/ESA and reviewed every two years.



AXOMACH® PANEL CONNECTOR



AXOMACH® SMD CONNECTOR



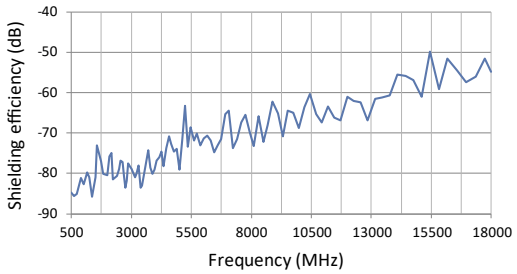
AXOMACH® CABLE MOUNT CONNECTOR

Electrical characteristics

Maximum rating for a 1 metre link terminated with two single way cable mount connectors.

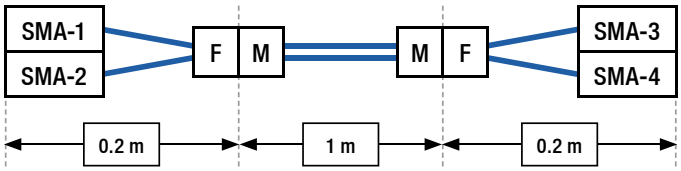
CHARACTERISTICS	VALUE	
Characteristic impedance (Zc)	90 Ω < Zc < 100 Ω	
Jitter PP (at 1, 3, 5, 6, 8 and 10 Gb/s)	Maximum 20 ps	
Jitter RMS (at 1, 3, 5, 6, 8 and 10 Gb/s)	Maximum 5 ps	
Quality factor (Qf)	At 1 Gb/s	minimum 20
	At 3 Gb/s	minimum 15
	At 5,6,8 and 10 Gb/s	minimum 10
Skew (Sk) between coaxial cables	Maximum 20 ps	
Insertion Loss (IL)	0 to 5 GHz	maximum -1 dB
	0 to 10 GHz	maximum -2 dB
Return Loss (RL)	0 to 5 GHz	maximum -12 dB
	0 to 10 GHz	maximum -9 dB
Crosstalk far end (xTf - 0 to 5 GHz)	Maximum -45 dB	
Crosstalk near end (xTn - 0 to 10 GHz)	Maximum -35 dB	
Time analysis (jitter and quality factor) at room temperature	*See table below*	

EMC: AXOMACH link shielding efficiency
(from 500 MHz to 18 GHz)



Shielding effectiveness for a
1 metre link < -60 dB up to 10 GHz

Time analysis (jitter & quality factor) at room temperature for a 1 metre link with 0.2 m test jig

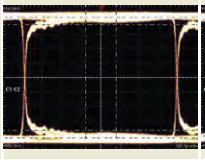
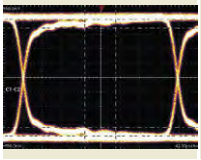
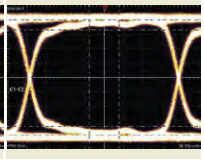
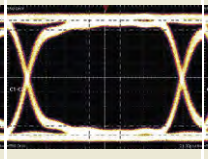
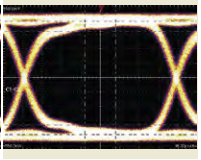
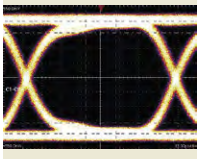


Which data rate for which length ?

This table is a design tool for cable routing and gives indicative values.

	0.5 m	1 m	2 m	3 m	4 m	5 m
1 to 5 Gb/s	✓	✓	✓	✓	✓	✓
6 to 7 Gb/s	✓	✓	✓	✓	✓	×
8 to 10 Gb/s	✓	✓	✓	✓	×	×

Links are measured with CML (Current Mode Logic) driver differential signal amplitude of 600 mVPP (worst case condition) and ±100 mV CML receiver input threshold.

DATA RATE	1 Gb/s	3 Gb/s	5 Gb/s	6 Gb/s	8 Gb/s	10 Gb/s
Jitter PP	< 20 ps	< 20 ps	< 20 ps	< 20 ps	< 20 ps	< 20 ps
Jitter RMS	< 5 ps	< 5 ps	< 5 ps	< 5 ps	< 5 ps	< 5 ps
Quality factor	> 20	> 15	> 10	> 10	> 10	> 10
Eye pattern						
Skew (between coaxial cables)	< 20 ps	< 20 ps	< 20 ps	< 20 ps	< 20 ps	< 20 ps

Generator output signal: 2^{7-1} PRBS pattern with $1V_{PP}$ differential amplitude.

More information available on request.

Mechanical characteristics

CHARACTERISTICS	VALUE
Maximum cable weight	15 g/m per cable 30 g/m per way
Mating force	< 5.6 N (2.8 N per contact)
Demating force	1 N < demating force < 5.6 N
Operating and storage temperature	-55°C to +125°C
Total Mass Loss (TML) Collected Volatile Condensable Material (CVCM) Recovered Mass Loss (RML)	< 1% < 0.1 % < 1%

See AxoMach® weight table on page F-65

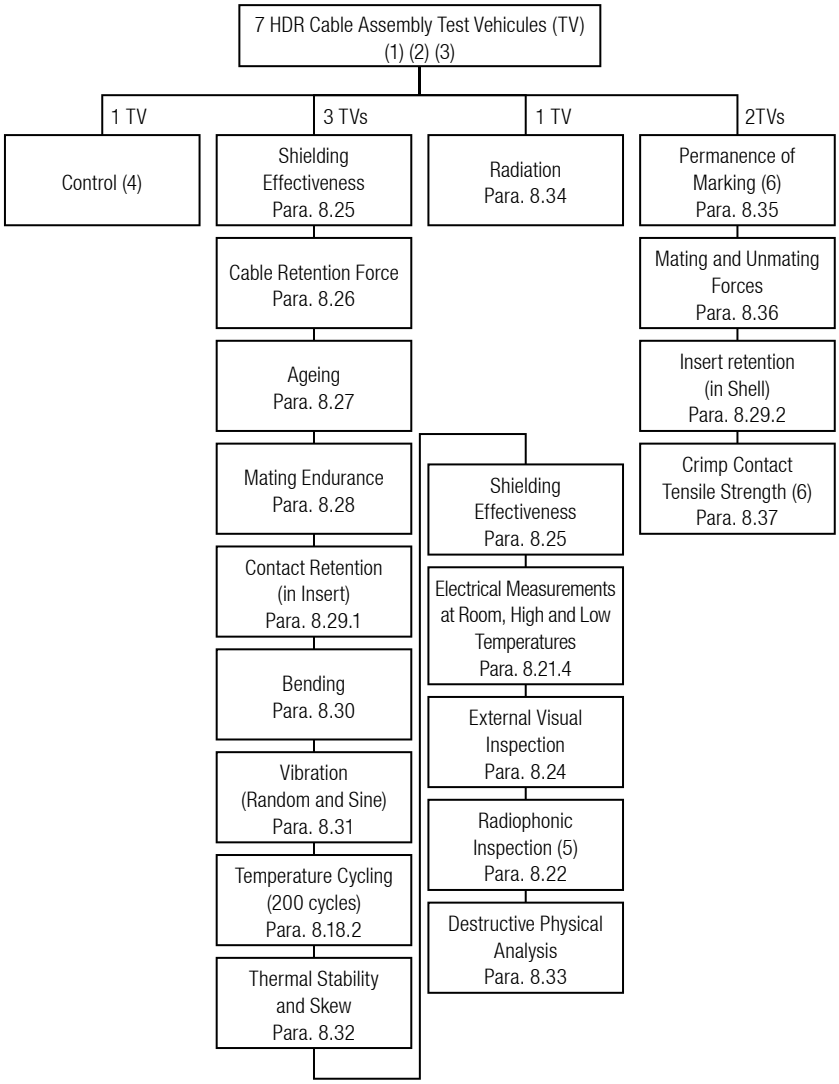
Manufacturing

AXOMACH® components are manufactured and tested in clean room conditions.
Cleanliness level: Class ISO 8 = Class 100 000 following FED STD 209E.

AXON' operators are certified by international space agencies on soldering and crimping process according to ECSS-Q-ST-70-08 & ECSS-Q-ST-70-26.
AXON' is monitored by CNES (French space agency) for AXOMACH® connectors and links manufacturing and controlled according to PID.

Qualification

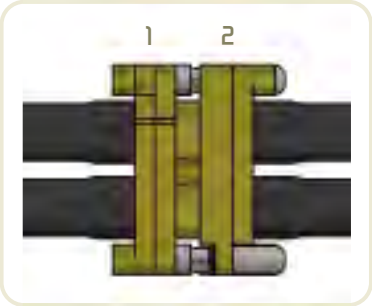
Environmental, mechanical and endurance testing are performed according to ESCC 3409 chart F4A.



All ESCC specifications are subject to change. Please refer to https://escies.org for latest specifications.

Compatibility guide

ESCC 3409 / 001 connector mating compatibility



Connector 1 code \ Connector 2 code	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
01				+			+											
02					+			+										
03						+			+									
04	+																	
05		+																
06			+															
07	+																	
08		+																
09			+															
10											+							+
11										+								
12														+	+	+		
13														+	+	+		
14												+	+				+	
15												+	+				+	
16												+	+				+	
17														+	+	+		
18										+								

Connector 1 code	Connector 2 code	01	02	03	04	05	06	07	08	09	10	11	18
3401 / 089	01	+											
	02		+										
	03			+									
	04										+		
	05	+											
	06		+										
	07			+									
	08										+		
3401 / 090	01	+											
	02		+										
	03			+									
	04				+			+					
	05					+			+				
	06						+			+			
	07										+	+	+

Cross codification guide

This document relates to AxoMach® High Data Rate products.
Axon' manufactures AxoMach® products with Axon' specification 07072-ST-MDSA-HDR-01.
This specification is expected to be replaced by the following ESCC specifications:

- ESCC 3401/089: Connectors, Electrical, Rectangular, Microminiature, High Data Rate based on AxoMach® & SpaceFibre types,
- ESCC 3401/090: Connector Savers and Accessories, Electrical, Rectangular, Microminiature, High Data Rate based on Axomach® & SpaceFibre types,
- ESCC 3409/001: High Data Rate Cable Assembly with Microminiature, Rectangular Coaxial Connectors based on Axomach® & SpaceFibre types.

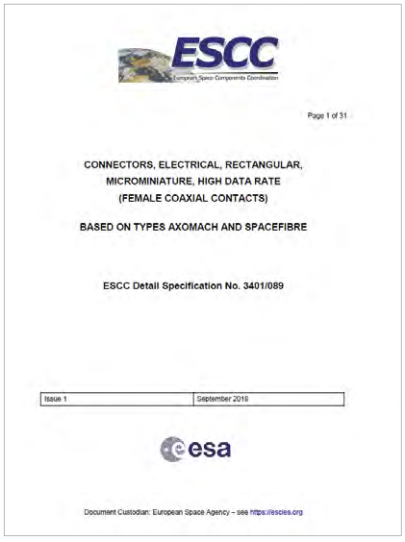
The aim of this document is to present the different codifications between those specifications.
Caution: variants of 07072-ST-MDSA-HDR-01 do not necessarily correspond to ESCC specification variants or connector codes.

The main following information are needed when requesting an offer or placing an order:

- Specification reference (07072-ST-MDSA HDR 01 or ESCC specification),
- Variants or connector codes,
- Lengths for cable assembly,
- Wiring for cable assembly.

Notes:

1. ESCC specification also describes SpaceFibre products which are not included into the 07072-ST-MDSA-HDR-01 specification.
2. The variant 01 in ESCC 3409/001 refers to a high data rate cable assembly with a coaxial cable type AXOWAVE SC25SP.


ESCC

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CONNECTORS, ELECTRICAL, RECTANGULAR,
MICROMINIATURE, HIGH DATA RATE
(FEMALE COAXIAL CONTACTS)

BASED ON TYPES AXOMACH AND SPACEFIBRE

ESCC Detail Specification No. 3401/089

Issue 1	September 2018

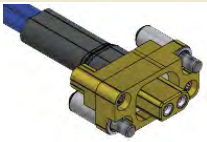
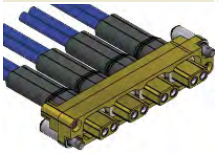
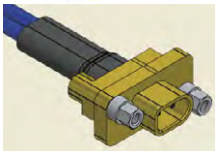
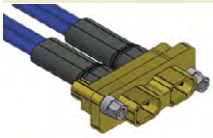
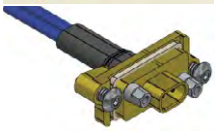
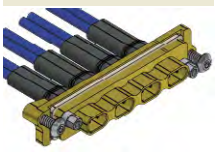
esa

Document Custodian: European Space Agency – see https://escies.org

ESCIES.ORG/

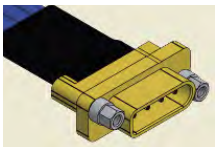
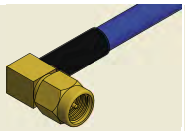
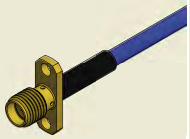
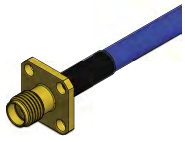
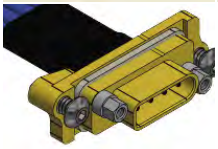
Cross codification for AxoMach® connectors

Choose the AxoMach® connector you need. AxoMach® connectors are assembled with coaxial cable(s) type AXOWAVE SC25SP. To order your complete assembly, please refer to pages F-61 and F-62.

Connector type		07072-ST-MDSA HDR-01	ESCC 3409/001
		Variant	Connector Code
AxoMach® HDR, 1-way, Male, In-line Plug		04	01
AxoMach® HDR, 2-way, Male, In-line Plug		05	02
AxoMach® HDR, 4-way, Male, In-line Plug		06	03
AxoMach® HDR, 1-way, Female, In-line Jack		07	04
AxoMach® HDR, 2-way, Female, In-line Jack		08	05
AxoMach® HDR, 4-way, Female, In-line Jack		09	06
AxoMach® HDR 1-way, Female, Panel Mount Jack		16	07
AxoMach® HDR 2-way, Female, Panel Mount Jack		17	08
AxoMach® HDR 4-way, Female, Panel Mount Jack		18	09

Cross codification for SpaceFibre and coaxial connectors

Choose the very connector you need. AxoMach® connectors are assembled with coaxial cable(s) type AXOWAVE SC25SP. To order your complete assembly, please refer to pages F-61 and F-62.

Connector type		07072-ST-MDSA HDR-01 Variant	ESCC 3409/001 Connector Code
SpaceFibre HDR, Male, In-line Plug		N/A	10
SpaceFibre HDR, Female, In-line Jack		N/A	11
SMA Connector, Male, Straight Plug ESCC 340200101B		20 340200101B	12
SMA Connector, Male, Right Angle Plug ESCC 340200109B		20 340200109B	13
SMA Connector, Female, Straight Jack ESCC 340200201B		20 340200201B	14
SMA Connector, Female, Straight Jack, Back Mounting, 2-Hole Flange-Mounted ESCC 340200209B		20 340200209B	15
SMA Connector, Female, Straight Jack, Back Mounting, 4-Hole Flange-Mounted ESCC 340200268B		20 340200268B	16
SMA Connector, Male, Straight Plug (Axon' Type P567525)		N/A	17
SpaceFibre HDR, Female, Panel Mount Jack		N/A	18

* N/A stands for Not Applicable: ESCC specification also describes SpaceFibre products which are not included into the Axon' 07072-ST-MDSA-HDR-01 specification.

Harness codification

Those two identification codes present high data rate cable assembly codifications depending on the specification.
For ESCC3409/001, Axon' will attribute a unique manufacturer specific assembly identification.

ESA SPECIFICATION: ESCC 3409/001

IDENTIFICATION CODE — 3409001 01 123ABC

DETAIL SPECIFICATION REFERENCE
3409001: High Data Rate cable assembly

COMPONENT TYPE VARIANT NUMBER
01: AxoWave® SC25SP

MANUFACTURER SPECIFIC ASSEMBLY ID.
123ABC: Specific cable assembly design (see §1.4.3*)

AXON' SPECIFICATION: 07072-ST-MDSA HDR-01

IDENTIFICATION CODE — AXOMACH 05 D 300 05

SERIES
AXOMACH: High Data Rate cable assembly

CONNECTOR 1 VARIANT

04: Male 1-way	**07:** Female 1-way	**16:** Panel mount female 1-way
05: Male 2-way	**08:** Female 2-way	**17:** Panel mount female 2-way
06: Male 4-way	**09:** Female 4-way	**18:** Panel mount female 4-way

20: ESCC3402 all variant listed in §1.5.3** or Axon' SMA all variant listed in §1.5.4**.

WIRING
I: Indirect wiring (see §4.5.4**) **D:** Direct wiring

LENGTH OF CABLE (in mm)
> 100 mm for variants 04, 07 & 16
> 200 mm for variants 05, 08 & 17***
> 500 mm for variants 06, 09 & 18***

CONNECTOR 2 VARIANT

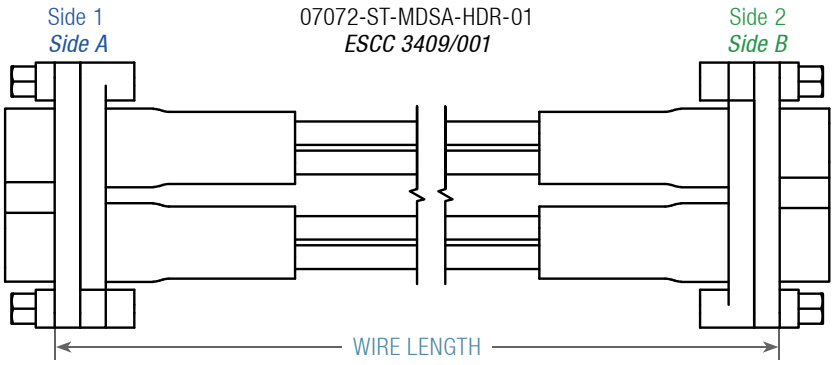
04: Male 1-way	**07:** Female 1-way	**16:** Panel mount female 1-way
05: Male 2-way	**08:** Female 2-way	**17:** Panel mount female 2-way
06: Male 4-way	**09:** Female 4-way	**18:** Panel mount female 4-way

20: ESCC3402 all variant listed in §1.5.3** or Axon' SMA all variant listed in §1.5.4**.
If connector 2 is not specified, the assembly is a pigtail.

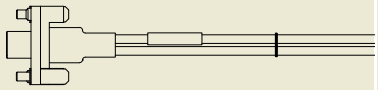
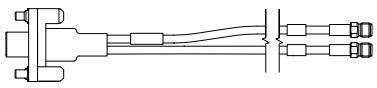
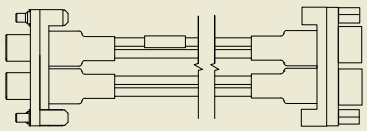
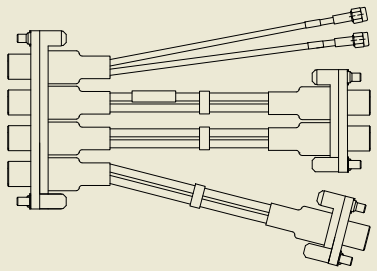
*: refers to ESCC 3409/001
**: refers to 07072-ST-MDSA HDR-01
***: for shorter cables, please contact us.

Codification examples

The table below gives codification examples.

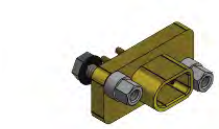
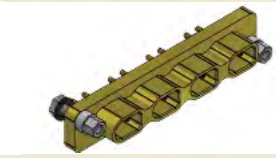
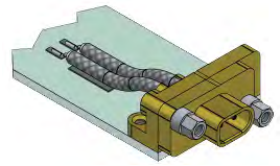
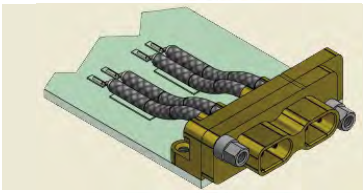
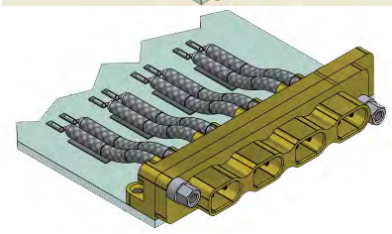
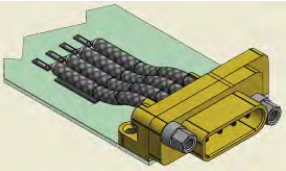


AxoMach® schematic diagram

Product	Description	Axon' Reference	07072-ST-MDSA HDR-01	ESCC 3409/001
The table below gives some codification examples				
	Harness assembly of 1000 mm composed of: Side 1/A: 1-way male connector Side 2/B: No connector	P558272x^L1000MM	**AXOMACH** **04 D 1000** *Variant 04* *Omit*	**3409001 01** **558272L1000MM** *Connector code 01* *Connector code 00*
	Harness assembly of 500 mm composed of: Side 1/A: 1-way male connector Side 2/B: SMA connectors 340200201	P558285x^L500MM	**AXOMACH 04** **D 500 20 340200201** Variant 04 Variant 20 340200201B	**3409001 01** **558285L500MM** *Connector code 01* *Connector code 14*
	Harness assembly of 1500 mm composed of: Side 1/A: 2-way male connector Side 2/B: 2-way female connector	P556762x^L1500MM	**AXOMACH** **05 D 1500 08** Variant 05 Variant 08	**3409001 01** **556762L1500MM** *Connector code 02* *Connector code 05*
Custom design assemblies are included in ESCC 3409/001				
	Harness assembly composed of: Side 1/A: 4-way male connector Side 2/B: - Two SMA Connectors 340200101B – L=1000mm - One 2-way male connector L=2000 mm - One 1-way male connector L=1500 mm	PYYYYYYx^	*Possible but not codified in the specification* Variant 06 Variant 20 340200101B Variant 05 Variant 04	**3409001 01 YYYYYY** *Connector code 03* *Connector code 12* *Connector code 02* *Connector code 01*

AxoMach® panel mount & SMD connectors

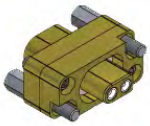
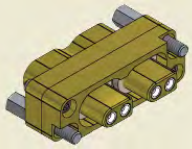
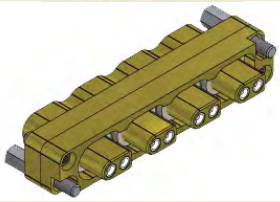
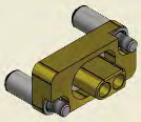
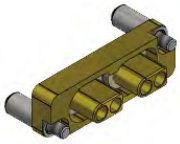
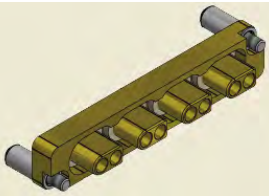
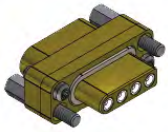
To order the connector you need, you just need to give us the ESCC reference (see last column).

Product		Axon' Part Number	07072-ST-MDSA HDR-01	ESCC Spec 3401/089
AxoMach® HDR, 1 Way, Female, Panel Mount Receptacle *Also called parallel gap–1 way*		P545459	AxoMach **01**	340108**901**B
AxoMach® HDR, 2 Way, Female, Panel Mount Receptacle *Also called parallel gap–2 way*		P545462	AxoMach **02**	340108**902**B
AxoMach® HDR, 4 Way, Female, Panel Mount Receptacle *Also called parallel gap–4 way*		P545465	AxoMach **03**	340108**903**B
SpaceFibre HDR, Female, Panel Mount Receptacle with Pin PCB Terminations *Also called parallel gap SpaceFibre*		P555780	N/A	340108**904**B
AxoMach® HDR, 1 Way, Female, SMD Receptacle with Hand-formable Coaxial Cable PCB Terminations *Also called QFX 1 way*		P545800	AxoMach **10**	340108**905**B
AxoMach® HDR, 2 Way, Female, SMD Receptacle with Hand-formable Coaxial Cable PCB Terminations *Also called QFX 2 way*		P545801	AxoMach **11**	340108**906**B
AxoMach® HDR, 4 Way, Female, SMD Receptacle with Hand-formable Coaxial Cable PCB Terminations *Also called QFX 4 way*		P545802	AxoMach **12**	340108**907**B
SpaceFibre HDR, Female, SMD Receptacle with Hand-formable Coaxial Cable PCB Terminations *Also called QFX SpaceFibre*		P552560	N/A	340108**908**B

Note: Variant number are in bold in the table above.
* N/A stands for Not Applicable: ESCC specification also describes SpaceFiber® products which are not included into the Axon' 07072-ST-MDSA-HDR-01 specification.

AxoMach® accessories

To order the connector saver or blanking plate you need, please give us the ESCC Spec (see last column).

Product		Axon' Part Number	07072-ST-MDSA HDR-01	ESCC Spec 3401/090
Connector Saver, AxoMach® HDR 1 Way		P549308	AxoMach **13**	340109**01**B
Connector Saver, AxoMach® HDR 2 Way		P549309	AxoMach **14**	340109**02**B
Connector Saver, AxoMach® HDR 4 Way		P549310	AxoMach **15**	340109**03**B
Blanking plate, AxoMach® HDR, 1 Way *Also called Plug 1 way*		P566471	AxoMach **50**	340109**04**B
Blanking plate, AxoMach® HDR, 2 Way *Also called Plug 2 way*		P566472	AxoMach **51**	340109**05**B
Blanking plate, AxoMach® HDR, 4 Way *Also called Plug 4 way*		P566473	AxoMach **52**	340109**06**B
Connector Saver, SpaceFibre HDR		P571080	N/A	340109**07**B

Note: Variant number are in bold in the table above.
* N/A stands for Not Applicable: ESCC specification also describes SpaceFiber® products which are not included into the Axon' 07072-ST-MDSA-HDR-01 specification.

Weights

SpaceWire solutions

Cables	
Classic 28AWG SpaceWire	85 g/m maximum
Classic 26AWG SpaceWire	115 g/m maximum
Low Mass 28AWG SpaceWire	42 g/m maximum

Connectors	
9 way male connector (with screwlock and backshell)	about 8 g
9 way female connector (with screwlock and backshell)	about 8 g
9 way female CBR connector	about 3 g

MicroMach® Connectors	
Male in-line connectors	9.5 g
Female panel mount connectors	9 g
Female edge PCB SMT panel mount connector	4.5 g
Female wired PCB panel mount connector	5 g
Female flex PCB panel mount connector	5.5 g
Saver connector	7.5 g

Low Mass solutions

Cables	
Low Mass 28AWG SpaceWire	42 g/m maximum
Ultra Low Mass Coax cable (with overall shield)	37.5 g/m maximum
Ultra Low Mass Coax cable (without overall shield)	32.5 g/m maximum

Connectors	
Micro-D connector (with screwlock and backshell)	about 8 g
Nano-D connector (with screwlock and backshell)	about 2 g

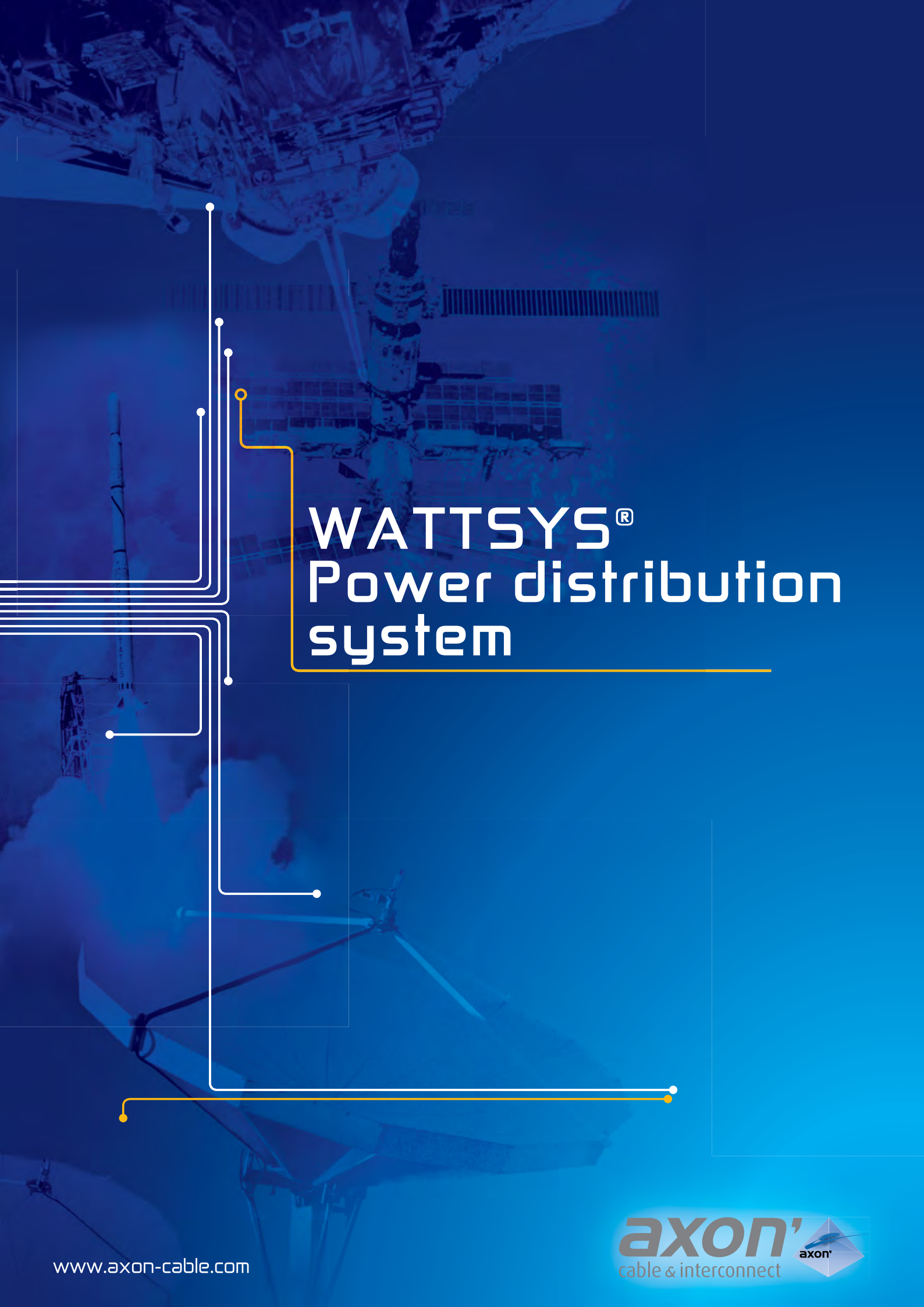
AXOMACH® links

Cables

AXON' REFERENCES	WEIGHT (g)
SC25SP (Microwave coaxial cable)	17 g/m (34 g/m per way)
SH22SW (QUASIFLEX hand-formable semi-rigid substitute)	17 g/m (34 g/m per way)

Connectors

ESCC REFERENCES	WEIGHT (g)
PCB / panel mount connectors	
3401/089 01	3 g
3401/089 02	5 g
3401/089 03	7 g
Panel mount connectors	
3409/001 connector code 07	8 g
3409/001 connector code 08	10 g
3409/001 connector code 09	15 g
Male cable mount connectors	
3409/001 connector code 01	6 g
3409/001 connector code 02	9 g
3409/001 connector code 03	15 g
Female cable mount connectors	
3409/001 connector code 04	6 g
3409/001 connector code 05	8 g
3409/001 connector code 06	12 g
PCB surface mount connectors	
3401/089 05	5.5 g
3401/089 06	8.4 g
3401/089 07	4.2 g
Connector savers	
3401/090 01	5 g
3401/090 02	7 g
3401/090 03	12 g
Blanking plates	
3401/090 04	3 g
3401/090 05	4 g
3401/090 06	5.5 g
SpaceFibre	
3401/089 04	4 g
3401/089 08	7.4 g
3401/090 07	4.9 g
3409/001 connector code 10	7 g
3409/001 connector code 11	8 g
3409/001 connector code 18	7.3 g



WATTSYS®
Power distribution system

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axon' cable & interconnect

WATTSYS®
Power distribution systems

As vital components for electrical power distribution in telecommunication satellites and land-based weapon systems, the bus and battery bars developed by AXON' ensure reliable distribution of constant energy.

BUS & BATTERY BARS

Bus and battery bars are used to distribute energy in the different parts of a satellite (see drawing):

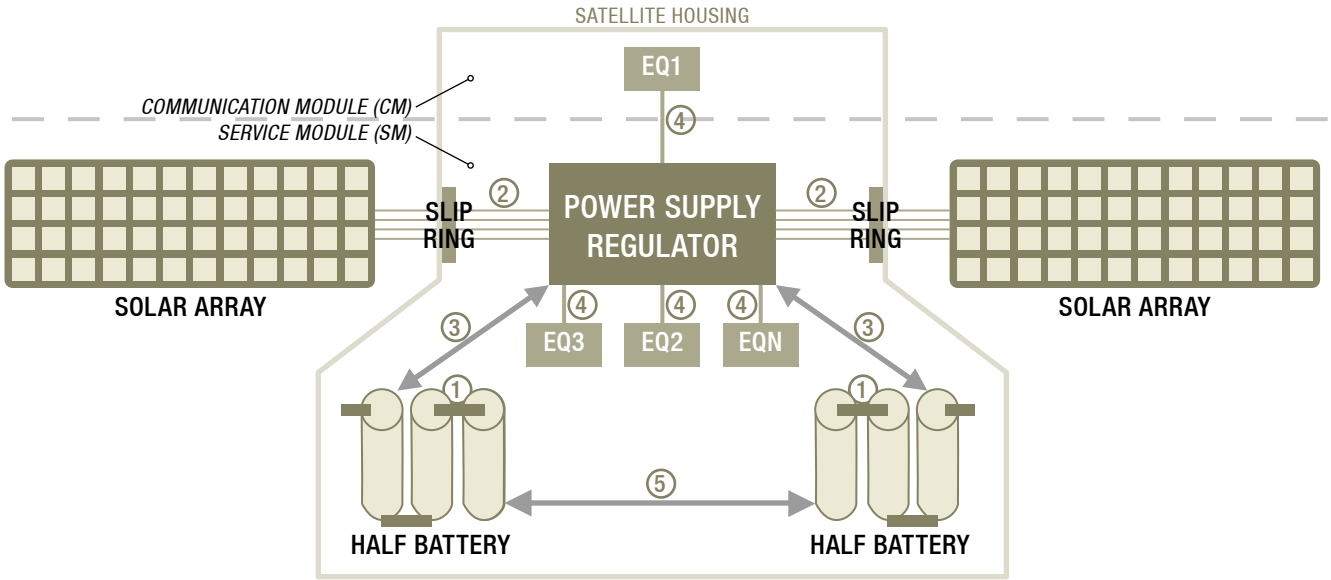
- between the different components of the batteries (e.g. cells, bypass, shunt, connectors.) (1),
- between the solar array slip ring and the power system regulator (PSR/PCU) (2),
- between the batteries and the power system regulator (3),
- between the power supply regulator system and the different devices in the satellite (e.g. computer, power emitter, navigation system, propulsion.) (4),
- between battery pack groups (5).

AXON's bus and battery bars are composed of silver plated pure aluminium or high conductivity aluminium alloy. They are characterised by their flat shape.

Their main advantages:

- high electrical conductivity of pure aluminium and aluminium alloy,
- mass reduction compared to a copper solution,
- improved heat dissipation in comparison with a circular power cable bundle,
- significant improvement in voltage drop throughout the power distribution chain.

Numerous satellites of the EUROSTAR 3000 platform have been equipped with AXON's bus and battery bars and have been in orbit for more than 10 years: e.g. ASTRA, ARABSAT, INTELSAT, SKYNET.

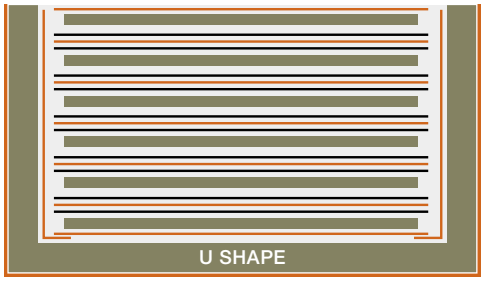


The construction of the bars can be single or multi-layer.
Depending on the application, different types of bars can be studied for specific applications.
Below is a description of the main shapes qualified by AXON'.
Other shapes can be studied for specific applications.

Flat cables: Monolayer inter cell battery bars.

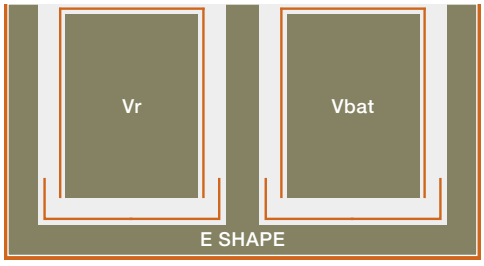
- Silver plated aluminium alloy
- Wrapped polyimide adhesive tape (50% overlap)

Type U: Multilayer bar for the link between the solar arrays and the power system regulator.



- Polyimide tape
- Prepreg glass fibre
- Silver plated aluminium alloy
- Epoxy filling

Type E: Monolayer bar for the link between the batteries and the power system regulator.



- Polyimide tape
- Silver plated aluminium alloy
- Epoxy filling

Type I: Monolayer bar for the link between the power system regulator and the different satellite devices.

- Silver plated pure aluminium
- Epoxy coating
- Silicone potting

MONOLAYER BAR TYPE E

MONOLAYER BAR TYPE I

FLAT CABLE TYPE

MAIN CHARACTERISTICS

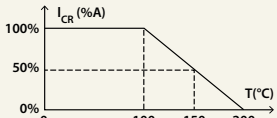
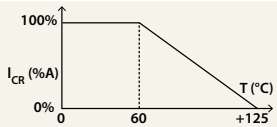
Type of bar (indicative values)

These bars shapes and sections are not frozen and can be matched to customer needs.

	RESISTANCE MAX (mΩ/m)	MAXIMUM DERATED CURRENT (A)	RATED VOLTAGE (VDC)	MAX. NON OPERATING TEMP. (°C)	SECTION (mm²)	@T° MAX (°C)
Bus bar Type U (0v shape) *31mm x 18mm (9 layers)*	0.201	200	100	120	184	105
U (Layer) 0.8mm x 23mm (each internal layer)	1.52	22	100	120	18.4	105
Bus bar Type E (0v shape) *28 x 24.8mm*	0.17	300	100	120	224	85
Bus bar Type I *version 8mm x 23mm (each internal layer of E shape bars)*	0.186	200	100	120	184	85
Bus bar Type I *version 3mm x 23mm (free I shape)*	0.406	80	100	120	69	105
Flat cables (battery bars) *3mm x 40mm*	0.233	300	100	180**	120	150*
Flat cables (battery bars) *4mm x 40mm*	0.175	400	100	180**	160	150*
Flat cables (battery bars) *5mm x 40mm*	0.160	500	100	180**	200	150

*: 110°C if a connector is bounded by soft soldering.
**: Without connectors.
For other bar shapes please contact us.

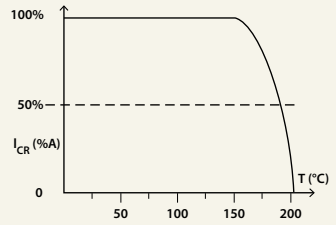
Type of connection (indicative values)

	MAX. CONTACT RESISTANCE (mΩ/m)	MAXIMUM DERATED CURRENT (A)	RATED VOLTAGE (VDC)	@T° MAX (°C)	SIZE (overall dimensions in mm)	PARAMETER DERATING INFORMATION
MMC (AXON' Micro Modular Connectors). Inline variant.	≤ 2.5	40* per contact	250	200	36 x 9 (4 contacts size)**	 100% current at 100°C
MMC (AXON' Micro Modular Connectors). PCB variant.	≤ 2.5	25* per contact	250	200	36 x 9 (4 contacts size)**	
Bolted interface (4 screws M4) e.g. flat cable (battery bar) terminations	≤ 0.02	400*	100	150	40 x 10 (contact surface without housing)**	100% current at 150°C
Space approved power D-Sub connector xWx	≤ 2.5 per contact	40* per contact	300	125	53 x 12 (4 contacts size)**	 100% current at 60°C
Space approved standard D-Sub connector	≤ 5 per contact	7.5* per contact	300	125	53 x 12 (4 contacts size)**	

*: See parameter derating information.
**: Please contact us for more information.
Other connector types are possible on request.

Flexible links and braid

Example of wires used for flexible links (indicative values)

	RESIS-TANCE (mΩ/m)	MAXIMUM CURRENT PER CONDUCTOR (A)	RATED VOLTAGE (VDC)	@T° MAX (°C)	SECTION (mm²)	PARAMETER DERATING INFORMATION (ALLOWABLE CURRENT)
ESA wire AWG12* ESCC 3901 001 31 (QPL)	6.03	23	600	200	3.2	
ESA wire AWG16* ESCC 3901 001 29 (QPL)	14.3	13	600	200	1.3	
ESA wire AWG20* ESCC 3901 002 59 (QPL)	32.2	7.5	600	200	0.6	
Power isolated copper braid P/N: P540409	0.3	200	100	200	62	100% current at 70°C 85% current at 85°C

* refer to AXON's ESA qualified ESCC cables for more information.
Other sections available on request.

GENERAL CHARACTERISTICS (ALL TYPE OF BARS)

CHARACTERISTICS	VALUE
Low outgassing materials	TML (Total Mass Loss) <1% CVCM (Collected Volatile Condensable Material) <0.1%
Operating temperature	-35°C to +85°C (for flat cables: -35°C to +150°C)
Qualification temperature	-40°C to +110°C
Insulation resistance between bars	> 1000 MΩ under 500 VDC
Maximum capacitance between bars	4 nF/m
Emissivity of bar surface	> 0.65

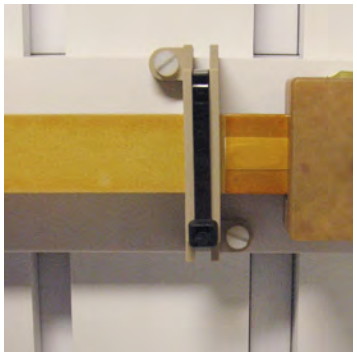
For all types of bars a double electrical insulation is effected between two conductors with different types of insulating materials:
- Silicone + epoxy,
- Epoxy + polyimide tape,....

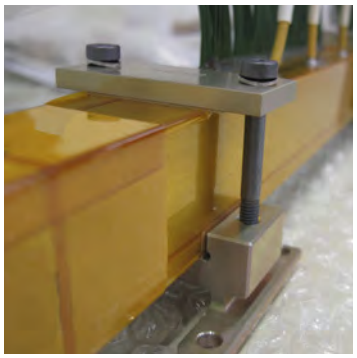
in order to guarantee an excellent insulation.

Heat resistance of bars is optimised:

- Flat bar shapes (surface increased = better heat dissipation)
- Outer surface insulation (thermal radiation improved)
- Low insulation thickness (thermal conduction improved)


RIGID FIXTURE FOR THIN BAR


FLEXIBLE FIXTURE FOR THIN BAR

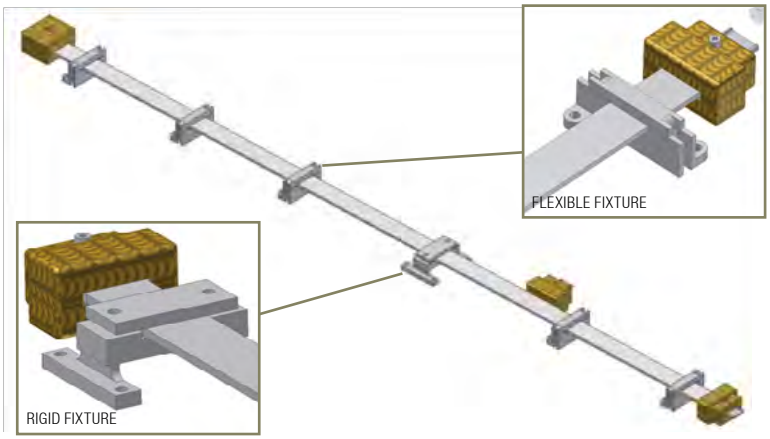

RIGID FIXTURE FOR THICK BAR


FLEXIBLE FIXTURE FOR THICK BAR

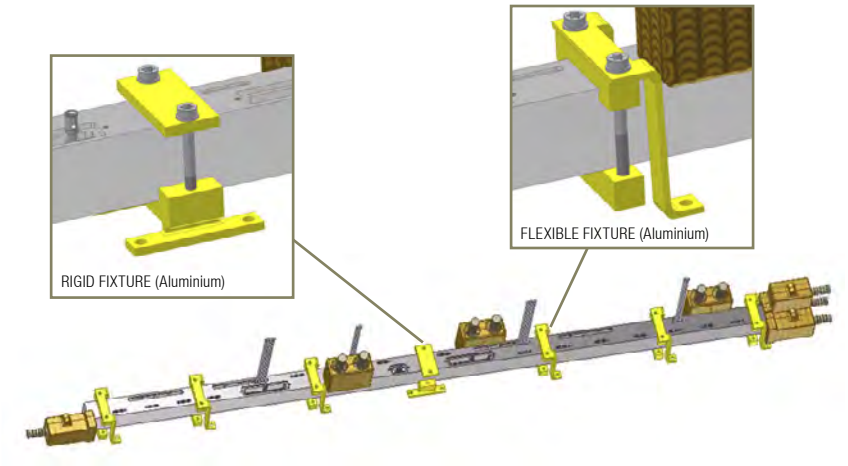
FIXING OF THE BARS IN THE SPACECRAFT

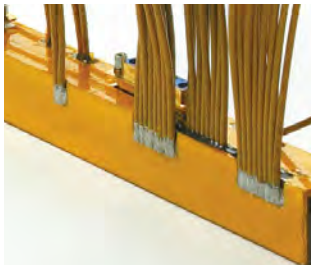
In order to install the bus bars onto the spacecraft walls, both rigid aluminium fixtures and flexible fixtures made of high performance thermoplastic polymers or aluminium assemblies are used. These significantly help to reduce the mechanical impact of vibration, shock and temperature. To mount the bar AXON' recommends one rigid and several flexible fixtures placed every 200 mm (7.9").
Flexible fixturing allows the bar to flex with the spacecraft movement, taking into account its thermo-elastic behaviour. Rigid support ensures complete fastening of the bar to the mechanical structure.
Installation of fixtures and bars are carried out according to the applicable customer specification.

EXAMPLE OF FIXTURING FOR "I"-SHAPE BAR

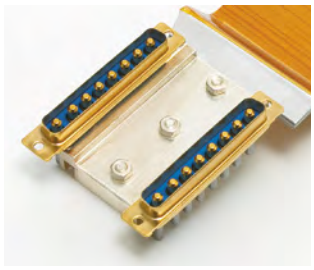


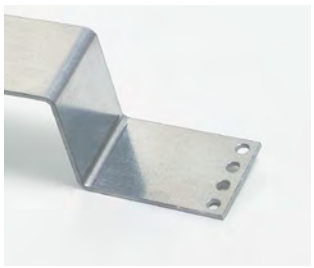
EXAMPLE OF FIXTURING FOR "E"-SHAPE BAR




WIRES SOLDERED TO THE BAR


FLEXIBLE COPPER POWER BRAID


CONTACT WELDED ONTO THE BARS


BOLTED CONNECTION


AXON' MICRO MODULAR CONNECTORS

BAR INTERCONNECTION

The bar can be connected via many different connectors and wires with different gauge sizes. The interconnection of Wattsys® bar is carried out with dismountable flexible or rigid links:

Dismountable flexible links:
- Wire bundles (e.g. ECSS wires) soldered to the bars,
- Flexible copper power braids.

Dismountable rigid teminations:
- Contacts welded onto the bars (compatible with standard connectors),
- Bolted connections (low contact resistance),
- AXON' power connectors (low size).
- AXON' Micro Modular Connectors (MMC).

The fixations of the bars (mechanical parts: e.g. screws, washers, machined parts.) have been designed to allow for either:
- a very tight mechanical connection of the bar (rigid fixation: no movement), or
- a flexible mechanical connection allowing for thermo elasticity (flexible fixation).

MANUFACTURING

Production of AXON's bus and battery bars is carried out under cleanroom conditions
- Cleanliness level: Class ISO 8 = Class 100 000 according to FED STD 209E.
- For soldering and crimping processes the operators are qualified according to ECSS-Q-ST-70-08 & ECSS-Q-ST-70-26.

The length and routing of the bars can be verified on a 3D mock-up.

QUALIFICATIONS

Various tests are carried out either in AXON's in-house test laboratory or in specialised test facilities outside the company.

AXON' has been approved by the CNES (French space agency) for manual wire crimping and welding according to PID CNES-PID-05-AXON (refer to CNES N° ASF 13-42).

Thermal tests:
- 1000 hours at 120°C,
- 100 thermal cycles at -30/+120°C with on/off current cycles,
- 2000 thermal cycles at -20/+90°C with on/off current cycles.

Vibration tests:
- Launcher spectrum in X,Y & Z axes,
- Vibrations on satellite qualification model.

Thermal Vacuum:
- Vacuum thermal cycles at -40/+110°C with on/off current cycles.

Mechanical test:
- Mounting/dismounting (for MCP & Bolted interfaces).

Non destructive investigations:
- Ultrasound cartography: to evaluate uniformity of layer pasting,
- Tomography (X-ray cartography): to verify the position of layers inside the shape.

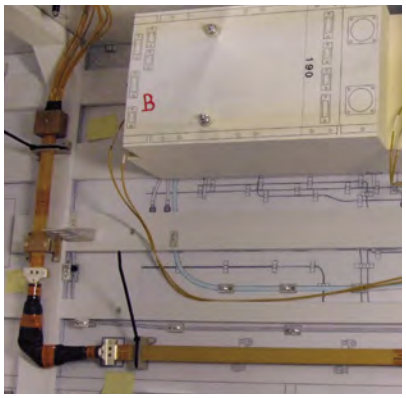
Destructive investigations:
- Scanning Electronic Microscope (SEM):
  - to verify wires & contact soldering,
  - to verify layer pasting & positioning,
- Differential Scanning Calorimetry polymer analyser: to verify the curing of adhesives.

SERVICE

AXON' provides after-sales service for the whole assembly and can assist on-site to help with integration and updating of the bars. Various installation documents can be supplied on request.

GUARANTY

AXON' bus and battery bars are guaranteed for 15 years use in orbit in addition to 5 years of storage.



3D MOCK-UP


MANUFACTURING OF BUS BARS IN CLEANROOM

AXOTRESS®

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axon' cable & interconnect

AXOTRESS

AXOTRESS

AXOTRESS H-3
Single copper braid H-4
Variable diameter tin plated copper single braid H-5
Optimized single copper braid H-6
Optimized double copper braid H-7

FOR SPACE APPLICATIONS

2µm silverplated copper single braid H-8
Optimized 2µm silverplated copper single braid H-9
Optimized 2µm silverplated copper double braid H-10
2µm silverplated aluminium single braid ... H-11
2µm silverplated aluminium double braid .. H-12

AXOTRESS

AXOTRESS DOUBLE BRAID

AXOTRESS

Single or double braids AXOTRESS are designed for manual shielding over a small length of assembly branches. The optimised versions have a guaranteed transfer impedance and can be used to manufacture harnesses with improved EMC.

Different strand material and platings are available.

STRAND MATERIAL	PLATING	TYPE OF BRAID
Copper	Tin, silver or nickel plating	Single braid
Copper	Tin plating	Single braid
Copper	Tin, silver or nickel plating	Single braid, optimized
Copper	Tin, silver or nickel plating	Double braid, optimized
Copper	2µm silver plating	Single braid
Copper	2µm silver plating	Single braid, optimized
Copper	2µm silver plating	Double braid, optimized
Aluminium	2µm silver plating	Single braid
Aluminium	2µm silver plating	Double braid

2µm silverplated products are designed for space applications.

AXOTRESS are braided on a carrier tube to maintain their shape during transport and ease installation.

According to the ordered length and diameter, the braids are packed on reels or drums.

Operating temperatures

PLATING	SPECIFICATIONS	OPERATING TEMP. (MAX.)
Tin	ASTM B33	150°C
Silver	ASTM B298	200°C
Nickel	ASTM B355	260°C

Single copper braid

AXO ST Ø xPC

AXO ST 4 xPC

AXON' REFERENCE

- AXO = AXOTRESS
- TYPE OF BRAID: ST = SINGLE BRAID
- DIAMETER UNDER BRAID
- PLATING
  - T = Tin plating
  - S = Silver plating
  - N = Nickel plating

The braids are supplied on a carrier tube.

REFERENCE	CARRIER TUBE*		BRAID		
	NOM. EXT. Ø mm	NOM. WEIGHT g/m	NOM. STRAND Ø mm	NOM. EXT. Ø mm	NOM. WEIGHT g/m
AXO ST 4 xPC	4	13	0.127	4.6	18
AXO ST 6 xPC	6	28	0.127	6.6	27
AXO ST 8 xPC	8	50	0.160	8.7	43
AXO ST 10 xPC	10	65	0.160	10.7	53
AXO ST 12 xPC	12	100	0.160	12.7	66
AXO ST 14 xPC	14	115	0.160	14.7	74
AXO ST 16 xPC	16	160	0.160	16.7	84
AXO ST 18 xPC	18	185	0.160	18.7	94
AXO ST 20 xPC	20	210	0.203	20.9	135
AXO ST 22 xPC	22	235	0.203	22.9	150
AXO ST 24 xPC	24	260	0.203	24.9	165
AXO ST 26 xPC	26	280	0.203	26.9	183
AXO ST 28 xPC	28	390	0.203	28.9	184
AXO ST 30 xPC	30	425	0.203	30.9	201

* Indicative values - Other diameters on request

Variable diameter tin plated copper single braid

ST Ø SN Ø

AXON' REFERENCE

ST 12 SN 63

- TYPE OF BRAID: ST = SINGLE BRAID
- STRAND DIAMETER
- PLATING : SN = Tin plating (pure SN)
- CARRIER TUBE DIAMETER

	carrier tube Ø in mm	MIN. braid Ø in mm	MAX. braid Ø in mm
63	6.3	4	13
95	9.5	7	18
127	12.7	9	27
200	20.0	16	35

The braids are supplied on a carrier tube.

NOTE: Each braid can be stretched or contracted to either reduce or expand the braid diameter according to the wire bundle size required. The minimum and maximum braid diameters are shown above for each carrier tube dimension.

REFERENCE	DRAWING NUMBER	CARRIER TUBE*		BRAID			TRANSFER IMPEDANCE mΩ/m**			
		NOM. EXT. Ø mm	NOM. WEIGHT g/m	NOM. STRAND Ø mm	NOM. INT. Ø mm	NOM. WEIGHT g/m*	1 MHz	10 MHz	30 MHz	70 MHz
ST 12 SN 63	P534300	6.3	24	0.12	4.00	52	24	85	135	170
					6.30	52	20	82	130	140
					9.50	52	11	50	95	175
ST 12 SN 95	P534301	9.5	52	0.12	9.50	55	11	46	70	80
					12.70	55	8	25	40	50
					14.00	55	6	8	14	20
ST 12 SN 127	P534302	12.7	87	0.12	12.70	70	11	47	70	100
					16.00	70	6	16	28	35
					20.00	70	6	8	16	20
					23.00	70	7	25	45	50
ST 12 SN 200	P534303	20.0	178	0.12	20.00	112	7	25	38	40
					23.00	112	7	22	33	40
					28.00	112	5	4	4	6
					32.00	112	5	17	25	30

* Indicative values: other diameters on request
** Indicative values: for the given diameters only

Optimized single copper braid

AXO ST Ø xPC ZT

AXO ST 4 xPC ZT

AXON' REFERENCE

- AXO = AXOTRESS
- TYPE OF BRAID: ST = SINGLE BRAID
- DIAMETER UNDER BRAID
- PLATING
  - T = Tin plating
  - S = Silver plating
  - N = Nickel plating
- OPTIMIZED TRANSFER IMPEDANCE

The braids are supplied on a carrier tube.

REFERENCE	CARRIER TUBE*		BRAID			TRANSFER IMPEDANCE mΩ/m			
	NOM. EXT. Ø mm	NOM. WEIGHT g/m	NOM. STRAND Ø mm	NOM. EXT. Ø mm	NOM. WEIGHT g/m	10 kHz	100 kHz	1 MHz	30 MHz
AXO ST 4 xPC ZT	4	13	0.127	4.6	22	15	15	18	50
AXO ST 6 xPC ZT	6	28	0.127	6.6	33	10	10	12	35
AXO ST 8 xPC ZT	8	50	0.160	8.7	52	6.0	6.0	7.0	30
AXO ST 10 xPC ZT	10	65	0.160	10.7	63	5.0	5.0	6.0	25
AXO ST 12 xPC ZT	12	100	0.160	12.7	63	5.0	5.0	8.0	50
AXO ST 14 xPC ZT	14	115	0.160	14.7	94	3.5	3.5	5.25	17.5
AXO ST 16 xPC ZT	16	160	0.160	16.7	108	3.2	4.0	6.0	30
AXO ST 18 xPC ZT	18	185	0.160	18.7	119	2.8	2.8	4.2	14
AXO ST 20 xPC ZT	20	210	0.203	20.9	177	2.0	2.0	3.0	10
AXO ST 22 xPC ZT	22	235	0.203	22.9	198	1.8	1.8	2.7	9.0
AXO ST 24 xPC ZT	24	260	0.203	24.9	206	1.7	1.7	2.55	8.5
AXO ST 26 xPC ZT	26	280	0.203	26.9	218	1.6	1.6	2.4	8.0
AXO ST 28 xPC ZT	28	390	0.203	28.9	231	1.5	1.5	2.25	7.5
AXO ST 30 xPC ZT	30	425	0.203	30.9	252	1.4	1.4	2.1	7.0

* Indicative values - Other diameters on request

Optimized double copper braid

AXO DT Ø xPC ZT

AXO DT 4 xPC ZT

AXON' REFERENCE

- AXO = AXOTRESS
- TYPE OF BRAID: DT = DOUBLE BRAID
- DIAMETER UNDER BRAID
- PLATING
  - T = Tin plating
  - S = Silver plating
  - N = Nickel plating
- OPTIMIZED TRANSFER IMPEDANCE

The braids are supplied on a carrier tube.

REFERENCE	CARRIER TUBE*		BRAID 1		BRAID 2		TOTAL BRAID		TRANSFER IMPEDANCE mΩ/m			
	NOM. EXT. Ø mm	NOM. WEIGHT g/m	NOM. STRAND Ø mm	NOM. WEIGHT g/m	NOM. STRAND Ø mm	NOM. WEIGHT g/m	NOM. EXT. Ø mm	NOM. WEIGHT g/m	10 kHz	100 kHz	1 MHz	30 MHz
AXO DT 4 xPC ZT	4	13	0.160	31	0.160	33	5.4	64	4.0	3.0	2.0	4.0
AXO DT 6 xPC ZT	6	28	0.160	42	0.160	47	7.4	89	3.5	2.5	0.8	2.5
AXO DT 8 xPC ZT	8	50	0.160	50	0.160	57	9.4	107	2.5	2.0	0.8	2.3
AXO DT 10 xPC ZT	10	65	0.160	63	0.160	73	11.4	136	2.5	2.0	1.0	4.0
AXO DT 12 xPC ZT	12	100	0.160	75	0.160	75	13.4	150	2.5	2.0	0.8	2.2
AXO DT 14 xPC ZT	14	115	0.160	94	0.160	95	15.4	189	1.6	1.5	0.6	1.0
AXO DT 16 xPC ZT	16	160	0.160	108	0.160	110	17.4	218	1.5	1.4	0.5	1.0
AXO DT 18 xPC ZT	18	185	0.160	119	0.160	119	19.4	238	1.3	1.5	0.6	1.0
AXO DT 20 xPC ZT	20	210	0.160	134	0.160	134	21.4	268	1.2	1.5	0.6	1.0
AXO DT 22 xPC ZT	22	235	0.160	135	0.160	135	23.4	270	1.2	1.2	0.5	0.9
AXO DT 24 xPC ZT	24	260	0.160	147	0.160	147	25.4	294	1.1	0.9	0.4	0.7
AXO DT 26 xPC ZT	26	280	0.160	159	0.160	167	27.4	326	1.0	0.9	0.4	0.7
AXO DT 28 xPC ZT	28	390	0.160	170	0.160	178	29.4	348	1.0	0.8	0.3	0.5
AXO DT 30 xPC ZT	30	425	0.160	181	0.160	189	31.4	370	1.0	0.8	0.3	0.5

* Indicative values - Other diameters on request

2µm silverplated copper single braid

BRAID ST Ø SPC 2µ

BRAID ST 6 SPC 2µ

AXON' REFERENCE

- TYPE OF BRAID: ST = SINGLE BRAID
- DIAMETER UNDER BRAID
- CONDUCTOR MATERIAL

Designed for space applications.
The braids are supplied on a carrier tube.

REFERENCE	DRAWING NUMBER	CARRIER TUBE*		BRAID		
		NOM. EXT. Ø mm	NOM. WEIGHT g/m	NOM. STRAND. Ø mm	NOM. EXT. Ø mm	NOM. WEIGHT g/m
Braid ST 2 SPC 2 microns	P543321	2	4	0.102	2.5	8
Braid ST 3 SPC 2 microns	P516787	3	9	0.102	3.5	12
Braid ST 4 SPC 2 microns	P530072	4	12	0.102	4.5	13
Braid ST 5 SPC 2 microns	P515268	5	15	0.127	5.6	22
Braid ST 6 SPC 2 microns	P516788	6	20	0.102	6.5	22
Braid ST 8 SPC 2 microns	P530073	8	25	0.127	8.6	33
Braid ST 10 SPC 2 microns	P515270	10	50	0.160	10.7	56
Braid ST 12 SPC 2 microns	P531296	12	80	0.160	12.7	75
Braid ST 14 SPC 2 microns	P546895	14	115	0.160	14.7	74
Braid ST 15 SPC 2 microns	P516790	15	106	0.127	15.6	64
Braid ST 16 SPC 2 microns	P546896	16	160	0.160	16.7	84
Braid ST 18 SPC 2 microns	P546897	18	185	0.160	18.7	94
Braid ST 20 SPC 2 microns	P515273	20	210	0.254	21.1	180
Braid ST 22 SPC 2 microns	P546898	22	235	0.203	22.9	150
Braid ST 24 SPC 2 microns	P546899	24	260	0.203	24.9	165
Braid ST 26 SPC 2 microns	P546900	26	280	0.203	26.9	183
Braid ST 28 SPC 2 microns	P546901	28	390	0.203	28.9	184
Braid ST 30 SPC 2 microns	P546902	30	425	0.203	30.9	201

* Indicative values - Other diameters on request

Optimized 2µm silverplated copper single braid

BRAID ST Ø SPC 2µ ZT

BRAID ST 3 SPC 2µ ZT

- AXON' REFERENCE
- TYPE OF BRAID: ST = SINGLE BRAID
- DIAMETER UNDER BRAID
- CONDUCTOR MATERIAL
- OPTIMIZED TRANSFER IMPEDANCE

Designed for space applications.
The braids are supplied on a carrier tube.

REFERENCE	DRAWING NUMBER	CARRIER TUBE*		BRAID			TRANSFER IMPEDANCE mΩ/m			
		NOM. EXT. Ø mm	NOM. WEIGHT g/m	NOM. STRAND Ø mm	NOM. EXT. Ø mm	NOM. WEIGHT g/m	10 kHz	100 kHz	1 MHz	30 MHz
Braid ST 3 SPC 2 microns ZT	P519133	3	8	0.127	3.6	16	18	18	25	100
Braid ST 4 SPC 2 microns ZT	P516021	4	13	0.127	4.6	21	15	15	18	50
Braid ST 6 SPC 2 microns ZT	P516022	6	28	0.160	6.6	32	10	10	12	35
Braid ST 8 SPC 2 microns ZT	P516023	8	50	0.160	8.7	52	6.0	6.0	7.0	30
Braid ST 10 SPC 2 microns ZT	P516024	10	65	0.160	10.7	64	5.0	5.0	6.0	25
Braid ST 12 SPC 2 microns ZT	P516025	12	100	0.160	12.7	80	5.0	5.0	8.0	50
Braid ST 14 SPC 2 microns ZT	P516026	14	115	0.160	14.7	95	3.5	3.5	5.25	17.5
Braid ST 16 SPC 2 microns ZT	P546909	16	160	0.160	16.7	108	3.2	4.0	6.0	30
Braid ST 18 SPC 2 microns ZT	P546910	18	185	0.160	18.7	119	2.8	2.8	4.2	14
Braid ST 20 SPC 2 microns ZT	P546911	20	210	0.203	20.9	177	2.0	2.0	3.0	10
Braid ST 22 SPC 2 microns ZT	P546912	22	235	0.203	22.9	198	1.8	1.8	2.7	9.0
Braid ST 24 SPC 2 microns ZT	P546913	24	260	0.203	24.9	206	1.7	1.7	2.55	8.5
Braid ST 26 SPC 2 microns ZT	P546914	26	280	0.203	26.9	218	1.6	1.6	2.4	8.0
Braid ST 28 SPC 2 microns ZT	P546915	28	390	0.203	28.9	231	1.5	1.5	2.25	7.5
Braid ST 30 SPC 2 microns ZT	P546916	30	425	0.203	30.9	252	1.4	1.4	2.1	7.0

* Indicative values - Other diameters on request

Optimized 2µm silverplated copper double braid

BRAID DT Ø SPC 2µ ZT

BRAID DT 4 SPC 2µ ZT

AXON' REFERENCE

- TYPE OF BRAID: DT = DOUBLE BRAID
- DIAMETER UNDER BRAID
- CONDUCTOR MATERIAL
- OPTIMIZED TRANSFER IMPEDANCE

Designed for space applications.
The braids are supplied on a carrier tube.

REFERENCE	DRAWING NUMBER	CARRIER TUBE*		BRAID 1		BRAID 2		TOTAL BRAID		TRANSFER IMPEDANCE mΩ/m			
		NOM. EXT. Ø mm	NOM. WEIGHT g/m	NOM. STRAND Ø mm	NOM. WEIGHT g/m	NOM. STRAND Ø mm	NOM. WEIGHT g/m	NOM. EXT. Ø mm	NOM. WEIGHT g/m	10 kHz	100 kHz	1 MHz	30 MHz
Braid DT 4 SPC 2µ ZT	P546917	4	13	0.160	31	0.160	33	5.4	64	4.0	3.0	2.0	4.0
Braid DT 6 SPC 2µ ZT	P546918	6	28	0.160	42	0.160	47	7.4	89	3.5	2.5	0.8	2.5
Braid DT 8 SPC 2µ ZT	P546919	8	50	0.160	50	0.160	57	9.4	107	2.5	2.0	0.8	2.3
Braid DT 10 SPC 2µ ZT	P546920	10	65	0.160	63	0.160	73	11.4	136	2.5	2.0	1.0	4.0
Braid DT 12 SPC 2µ ZT	P546921	12	100	0.160	75	0.160	75	13.4	150	2.5	2.0	0.8	2.2
Braid DT 14 SPC 2µ ZT	P546922	14	115	0.160	94	0.160	95	15.4	189	1.6	1.5	0.6	1.0
Braid DT 16 SPC 2µ ZT	P546923	16	160	0.160	108	0.160	110	17.4	218	1.5	1.4	0.5	1.0
Braid DT 18 SPC 2µ ZT	P546924	18	185	0.160	119	0.160	119	19.4	238	1.3	1.5	0.6	1.0
Braid DT 20 SPC 2µ ZT	P546925	20	210	0.160	134	0.160	134	21.4	268	1.2	1.5	0.6	1.0
Braid DT 22 SPC 2µ ZT	P546926	22	235	0.160	135	0.160	135	23.4	270	1.2	1.2	0.5	0.9
Braid DT 24 SPC 2µ ZT	P546927	24	260	0.160	147	0.160	147	25.4	294	1.1	0.9	0.4	0.7
Braid DT 26 SPC 2µ ZT	P546928	26	280	0.160	159	0.160	167	27.4	326	1.0	0.9	0.4	0.7
Braid DT 28 SPC 2µ ZT	P546929	28	390	0.160	170	0.160	178	29.4	348	1.0	0.8	0.3	0.5
Braid DT 30 SPC 2µ ZT	P546930	30	425	0.160	181	0.160	189	31.4	370	1.0	0.8	0.3	0.5

* Indicative values - Other diameters on request

2µm silverplated aluminium single braid

AXO ST Ø SPA

AXO ST 6 SPA

AXON' REFERENCE

- AXO = AXOTRESS
- TYPE OF BRAID: ST = SINGLE BRAID
- DIAMETER UNDER BRAID
- CONDUCTOR MATERIAL

Designed for space applications.
The braids are supplied on a carrier tube.

REFERENCE	DRAWING NUMBER	CARRIER TUBE*		BRAID		
		NOM. EXT. Ø mm	NOM. WEIGHT g/m	NOM. STRAND Ø mm	NOM. EXT. Ø mm	NOM. WEIGHT g/m
AXO ST 6 SPA	P546983	6	19	0.12	6.5	9.5
AXO ST 8 SPA	P546984	8	28	0.12	8.5	13.1
AXO ST 10 SPA	P536823	10	50	0.12	10.5	16.6
AXO ST 12 SPA	P546985	12	62	0.15	12.7	25.2
AXO ST 15 SPA	P546986	15	75	0.2	15.9	40.0
AXO ST 18 SPA	P546987	18	118	0.2	18.9	49.2
AXO ST 20 SPA	P546988	20	161	0.2	20.9	55.3
AXO ST 22 SPA	P546989	22	215	0.2	22.9	61.5
AXO ST 25 SPA	P546990	25	215	0.2	25.9	67.7
AXO ST 30 SPA	P546991	30	320	0.25	31.1	103.4

* Indicative values - Other diameters on request

2µm silverplated aluminium double braid

AXO DT Ø SPA

AXO DT 6 SPA

AXON' REFERENCE

- AXO = AXOTRESS
- TYPE OF BRAID: DT = DOUBLE BRAID
- DIAMETER UNDER BRAID
- CONDUCTOR MATERIAL

Designed for space applications.
The braids are supplied on a carrier tube.

REFERENCE	DRAWING NUMBER	CARRIER TUBE*		BRAID 1		BRAID 2		TOTAL BRAID	
		NOM. EXT. Ø mm	NOM. WEIGHT g/m	NOM. STRAND Ø mm	NOM. WEIGHT g/m	NOM. STRAND Ø mm	NOM. WEIGHT g/m	NOM. EXT. Ø mm	NOM. WEIGHT g/m
AXO DT 6 SPA	P546992	6	19	0.12	10.70	0.12	10.3	7.1	21.0
AXO DT 8 SPA	P541433	8	28	0.12	14.26	0.12	13.7	9.1	28.0
AXO DT 10 SPA	P546993	10	50	0.12	16.64	0.12	16.2	11.1	32.8
AXO DT 12 SPA	P546994	12	62	0.15	25.15	0.15	24.3	13.3	49.4
AXO DT 15 SPA	P546995	15	75	0.20	40.03	0.20	38.9	16.8	78.9
AXO DT 18 SPA	P546996	18	118	0.20	49.15	0.20	47.2	19.8	96.3
AXO DT 20 SPA	P546997	20	161	0.20	55.30	0.20	53.1	21.8	108.4
AXO DT 22 SPA	P546998	22	215	0.20	61.45	0.20	59.0	23.8	120.5
AXO DT 25 SPA	P546999	25	215	0.20	67.70	0.20	65.7	26.8	133.4
AXO DT 30 SPA	P547000	30	320	0.25	103.40	0.25	101.6	32.2	205.0

Accessories

www.axon-cable.com

axon' cable & interconnect

Accessories

They have been qualified on the Ariane 5, Automatic Transfer Vehicle programmes and several satellites (Spacebus 4000, Eurostar 3000...).

CONNECTOR BACKSHELLS

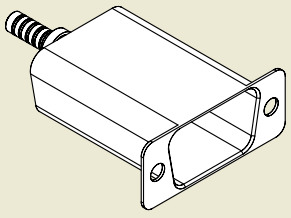
Backshells are used to protect the EMI performance of the assembly which could decrease with a poor quality EMI link. They also bring mechanical protection to the terminations. AXON' backshells can be placed behind circular connectors including MIL-C-38999 connectors or behind rectangular connectors including D-Sub connectors.

AXON' designs backshells not only for its own cables but also for your specific requirements. Some of our D-Sub backshells, specially adapted to databus cables entry, have been designed to be mounted inside MIL-STD-1553 networks. Different shell sizes are available: from 9 ways (size E) to 50 ways (size D) with one or two cable entries or with a more complex construction if required. The funnel allows different shield terminations including hexagonal crimping or AXOCLAMP® band. The use of backshells is strongly recommended to have good shield coverage as requested by the MIL-STD-1553 standard.

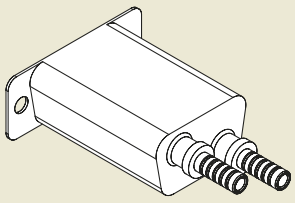
For your specific requirements, AXON' can adapt, for example, the size of the funnel, the orientation of the funnel and the cabling room length. The cable entry can be axial or have a transverse angle of 90° or 45°. The diameter of the cable entry can be adapted to the cable to be used.

AXON' lightweight backshells are made with solid fully machined aluminium alloy with gold plating over nickel in compliance with MIL-G-45204 or other relevant plating requirements. They are non magnetic. Some Micro-D backshells have also been designed by our engineers. AXON' has a complete range of Micro-D connectors with standard or custom designed versions. Please, ask for our brochure.

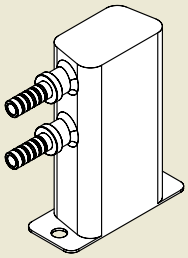
D-SUB BACKSHELL
1 AXIAL CABLE ENTRIES



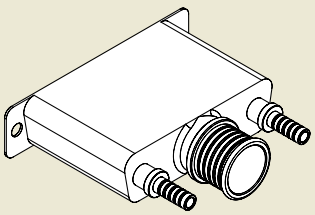
D-SUB BACKSHELL
2 AXIAL CABLE ENTRIES

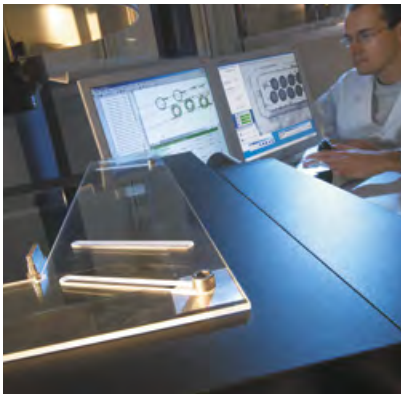


D-SUB BACKSHELL
2 TRANSVERSE CABLE ENTRIES

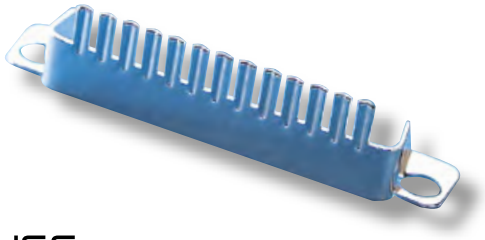


2 DATABUS CABLE ENTRIES
WITH A BIGGER CABLE ENTRY

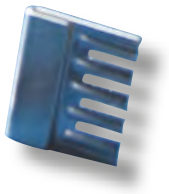




RHEOLOGY LABORATORY



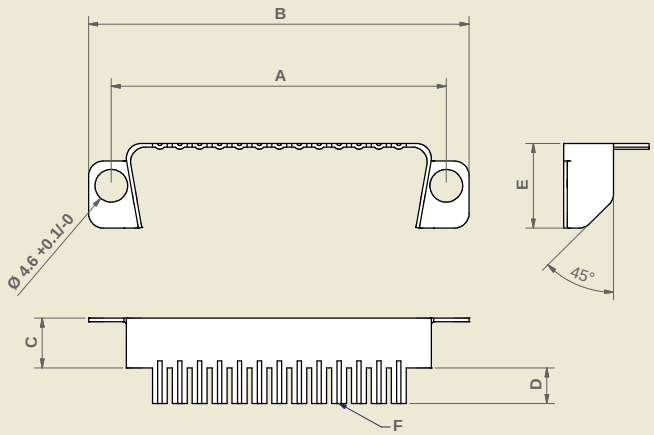
D-SUB OR MICRO-D HALORINGS

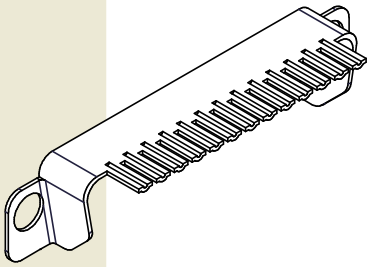


In order to facilitate the shield grounding of a cable made with several shielded wires, pairs or cables, AXON' recommends the use of **halorings**. These accessories are directly connected between the D-Sub connector and the backshell. The braid of the shielded wires is soldered onto the individual tines of the silver plated comb (F). This technology gives a very good electrical contact and saves time.

The halorings are made of copper alloy (brass) with silver plating. They are qualified according to UNS C27000 & AMS 2410 test methods.

HALORING
FOR D-SUB CONNECTOR

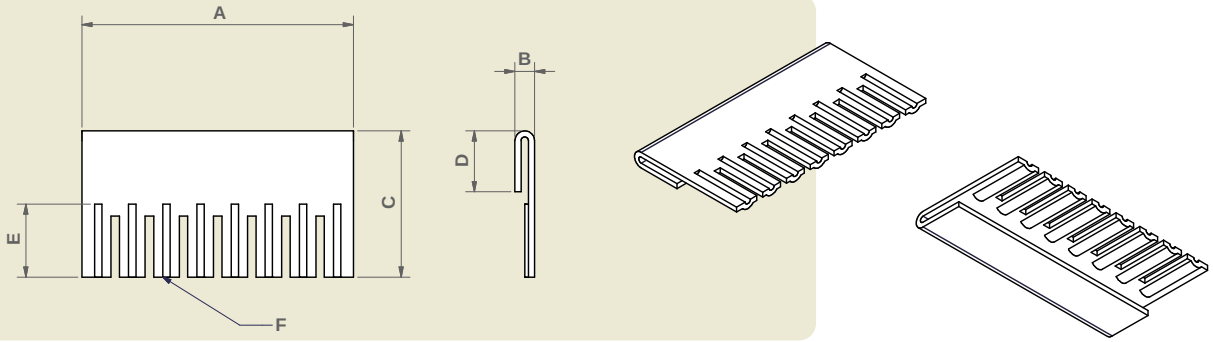




DESIGNATION	SINGLE HALORING PART NUMBER	DIMENSIONS (mm)						SIZE OF CONNECTOR
		A	B	C	D	E	F (*)	
D-SUB HALORING E	HALORING 040475 A	25.1	31.26	7	5	11.91	5	E
D-SUB HALORING A	HALORING 040476 A	33.4	39.55	7	5	11.91	8	A
D-SUB HALORING B	HALORING 040477 A	47.1	53.51	7	5	11.91	13	B
D-SUB HALORING C	HALORING 040478 A	63.5	69.7	7	5	11.91	17	C
D-SUB HALORING D	HALORING 040479 A	61.0	67.31	7	5	14.45	17	D
D-SUB HALORING F	HALORING 040630 A	63.5	69.71	7	5	14.45	17	F

(*) Number of tines = number of braids that can be soldered

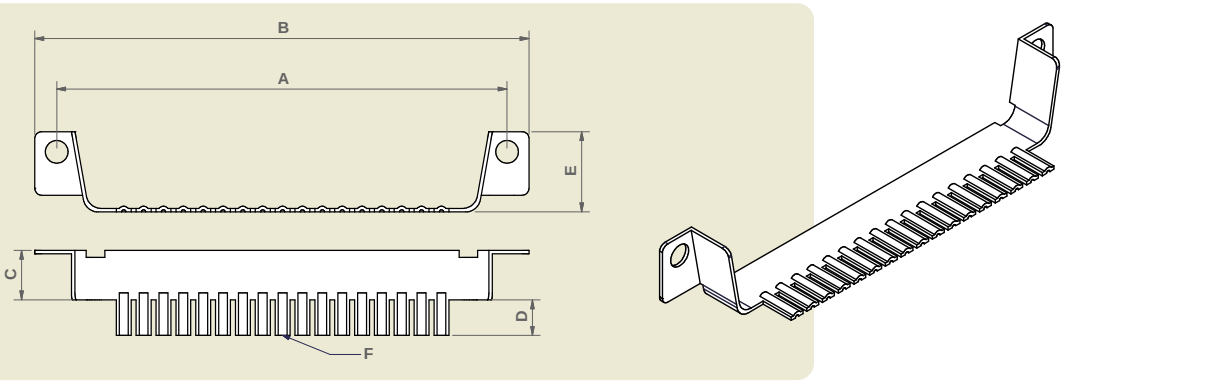
BACKSHELL HALORING FOR D-SUB CONNECTOR (**)



DESIGNATION	SINGLE HALORING PART NUMBER	DIMENSIONS (mm)						SIZE OF CONNECTOR
		A	B	C	D	E	F (*)	
BACKSHELL HALORING E	HALORING 040486 A	14.64	1.6	12	5	6	5	E
BACKSHELL HALORING A	HALORING 040487 A	22.26	1.6	12	5	6	8	A
BACKSHELL HALORING B	HALORING 040488 A	34.96	1.6	12	5	6	13	B
BACKSHELL HALORING C	HALORING 040489 A	47.46	1.6	12	5	6	17	C
BACKSHELL HALORING D	HALORING 040489 A	47.46	1.6	12	5	6	17	D

(*) Number of tines = number of braids that can be soldered
(**) This haloring can be adapted to other rectangular connector types

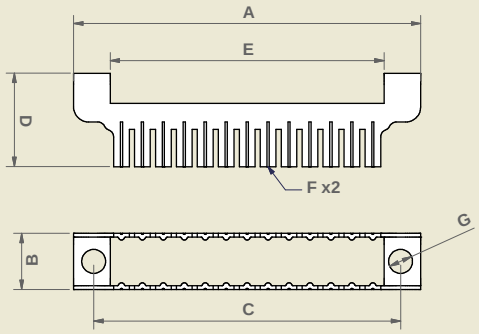
REVERSED HALORING FOR D-SUB CONNECTOR

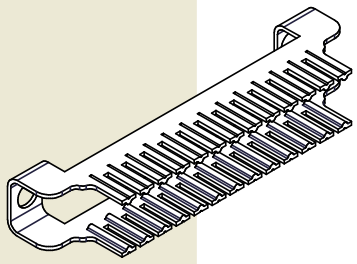


DESIGNATION	SINGLE HALORING PART NUMBER	DIMENSIONS (mm)						SIZE OF CONNECTOR
		A	B	C	D	E	F (*)	
REVERSED HALORING F	HALORING 041035 A	63.51	69.68	7	5	11.32	17	F

(*) Number of tines = number of braids that can be soldered

HALORING
FOR MICRO-D CONNECTOR





DESIGNATION	SINGLE HALORING PART NUMBER		DIMENSIONS (mm)						SIZE OF CONNECTOR
	G=2.4	G=3.2	A	B	C	D	E	F (*)	
MICRO-D HALORING 9	HALORING 040773 A	HALORING 041701 A	19.22	7.5	14.35	12	10.22	4	9
MICRO-D HALORING 15	HALORING 040774 A	HALORING 041702 A	23.03	7.5	18.16	12	14.03	5	15
MICRO-D HALORING 21	HALORING 040771 A	HALORING 042316 A	26.84	7.5	21.97	12	17.84	6	21
MICRO-D HALORING 25	HALORING 040775 A	HALORING 041667 A	29.38	7.5	24.51	12	20.38	8	25
MICRO-D HALORING 31	HALORING 040776 A	HALORING 042317 A	33.19	7.5	28.32	12	24.19	10	31
MICRO-D HALORING 37	HALORING 040633 A	HALORING 041703 A	37	7.5	32.13	12	28	10	37
MICRO-D HALORING 51	HALORING 040777 A	HALORING 041537 A	35.8	8.5	30.86	12	27	10	51

(*) Number of tines = number of braids that can be soldered

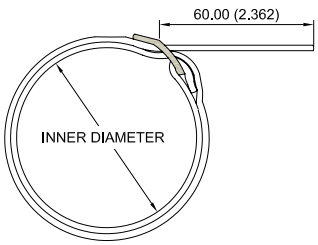
HARDWARE COMMON TO ALL SIZES
Hex socket hardware: MAHM 505304132 A
Slotted head hardware: MAHM 505304133 A
U-Clip: MAHM 001304131 A

AXOCLAMP® EMI Band termination system

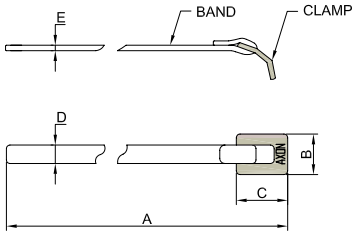
TYPE AX CL xx

Shieding termination for connectors can be carried out on 360°with a patented metal band called AXOCLAMP®. This ensures the continuity of shielding efficiency at the cable/connector junction.

COILED AXOCLAMP®



STRAIGHT AXOCLAMP®



Dimensions are in millimetres (inches)

IDENTIFICATION CODE

AX CL	01
AXOCLAMP®	BAND TYPES 01: STANDARD 02: MICROBAND DOUBLE WRAPPED 03: MICROBAND DOUBLE WRAPPED

The standard version is coiled but straight AXOCLAMP® can be delivered on request (reference example AXCL03D).
Minimum quantity: 100 pieces per reference.

DIMENSIONS

Dimensions are in millimetres (inches)

SPECIFICATIONS	AXOCLAMP® STANDARD	AXOCLAMP® MICROBAND	
REFERENCE	AXCL 01	AXCL 02	AXCL 03
DIMENSION A	375 (14.764)	375 (14.764)	200 (7.874)
DIMENSION B	9 (.364)	5.5 (.217)	5.2 (.205)
DIMENSION C	10 (.394)	8 (.315)	5.5 (.217)
DIMENSION D	5.9 (.232)	3.5 (.138)	3 (.118)
DIMENSION E	0.5 (.020)	0.5 (.020)	0.35 (.014)
MINIMUM DIAMETER*	10 (.394)	5 (.197)	5 (.197)
MAXIMUM DIAMETER*	40 (1.575)	15 (.591)	15 (.591)

* Minimum and maximum diameter of the backshell funnel on which the AXOCLAMP® can be mounted.

BANDING TOOLS

	MANUAL HAND TOOL	CLAMPING VALUES	PNEUMATIC CLAMPING TOOL	RECOMMENDED BANDING VALUES*	CALIBRATION DEVICE
AXOCLAMP® AX CL 01	A40199	100-180 LBS	A35199	160	A 50099
AXOCLAMP® AX CL 02	A40199	100-180 LBS	A35199	125	A 50099
AXOCLAMP® AX CL 03	A30199	60-100 LBS	A35599	90	A 50099

* Banding values are given for information only.

Harness expertise & quality assurance

www.axon-cable.com

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.

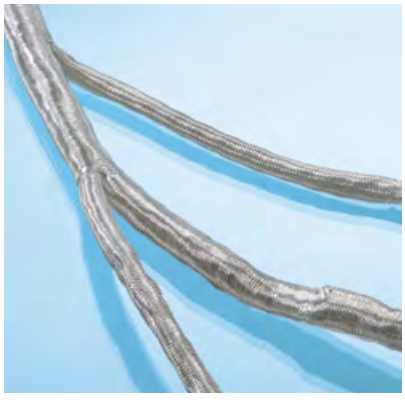
Harness capabilities

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.

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