STAR-Dundee
SpaceWire and SpaceFibre Expertise

Lab Cables for SpaceWire Equipment

STAR-Dundee's Lab Cables for SpaceWire Equipment have been designed to be easy to use in the laboratory while giving similar performance to standard SpaceWire cables. The innovative connector assembly uses captive jack screws, allowing the connector to be fully mated before the jack screws are screwed home. This makes mating and de-mating the connectors much easier, ideal for the lab. The Lab Cables are not suitable for use in a thermal-vacuum chamber.

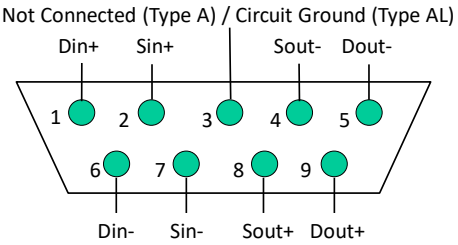
Lab Cable for SpaceWire Equipment

Cable

The cable used in STAR-Dundee's Lab Cable Assemblies for SpaceWire Equipment was specially designed to have similar electrical properties to "true" SpaceWire cable while costing less and being more flexible. Each twisted pair has 100 ohm differential impedance and an individual shield. The overall cable has an outer shield. The Lab Cable electrical properties are listed in the Specifications on the following page.

Connectors

The connector used on the Lab Cable Assembly for SpaceWire Equipment is the 9-pin micro-miniature D-type male connector, as defined in the SpaceWire standard. Commercial versions of this type of connector are used. The pinout of the connector is illustrated in the figure below, viewed from rear of receptacle or front of plug.



Viewed from rear of receptacle or front of plug

SpaceWire Connector Pinout

To ease handling of the finished cable assembly, captive jack screws are used. The jack screws are loose within their captive housing to allow the connector to be fully mated before the jack screws are tightened. The jack screws have hex heads to enable a ball-head screwdriver to be used to tighten them. This again eases handling of the cable assembly.

Type A and Type AL Cable Assemblies

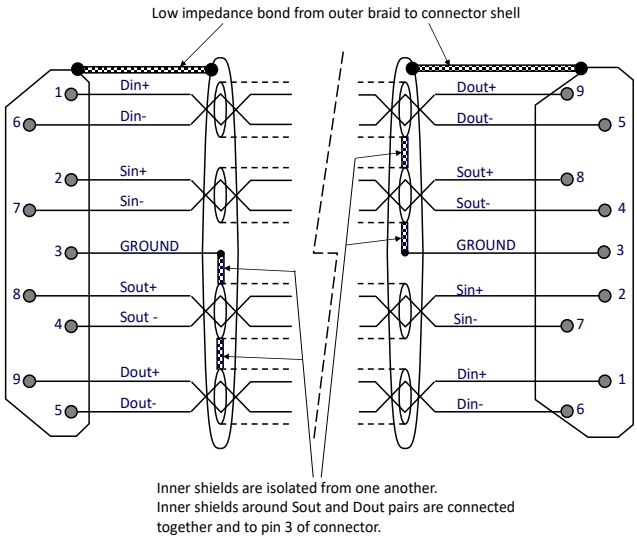
The latest revision of the SpaceWire standard, ECSS-E-ST-50-12C Rev.1, defines two types of cable assemblies: Type A and Type AL. STAR-Dundee offers both Type A and Type AL Lab Cable Assemblies for SpaceWire Equipment.

The cable assembly defined in previous revisions of the SpaceWire standard is now named Type AL in the latest revision of the standard, with the "L" standing for legacy. These were the cable assemblies STAR-Dundee offered as standard prior to the publication of the latest revision of the SpaceWire standard in 2019. This latest revision states that these Type AL cable assemblies should not be used for new designs.

The inner-shields of Type AL cable assemblies are connected to pin 3 of the connector at the transmit end of the cable only. The Type A cable assembly improves on this by connecting the inner shields to the connector shell at both ends. Pin 3 is not connected.

Type AL Cable Assembly

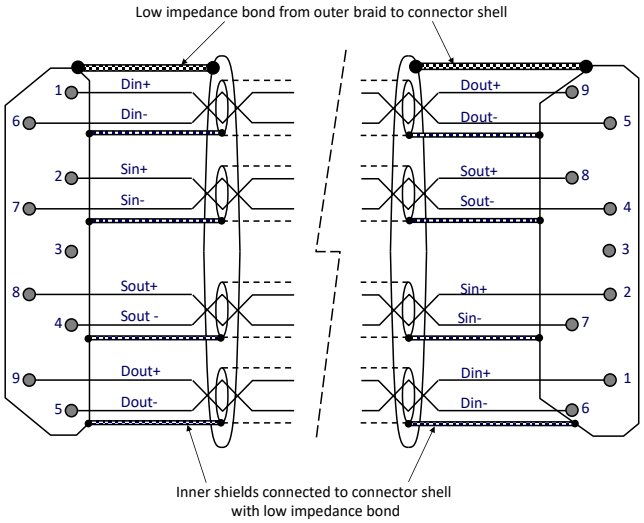
The wiring of the STAR-Dundee Type AL Lab Cable Assembly for SpaceWire Equipment is the same as defined in the SpaceWire standard for Type AL cable assemblies. The inner shields of the Dout and Sout twisted pairs are connected to pin 3 of the connectors using the inner shield drain wire. The outer shield drain wire is bonded to the connector shell. The cable is retained using potting; there is no metal backshell.



Type AL SpaceWire Cable Assembly Wiring Diagram

Type A Cable Assembly

The wiring of the STAR-Dundee Type A Lab Cable Assembly for SpaceWire Equipment is as defined in the SpaceWire standard for Type A cable assemblies. The inner shields of the twisted pairs are connected to the connector shell while pin 3 is not connected. The outer shield is also connected to the connector shell. The cable is retained using potting; there is no metal backshell.



Type A SpaceWire Cable Assembly Wiring Diagram

Type A cables are recommended for all new applications.

Ordering Information

Both Type A and Type AL Lab Cables for SpaceWire Equipment are available in several standard lengths:

- 0.5m
- 1m
- 2m
- 3m
- 5m
- 10m

These lengths are normally held as stock.

Other lengths and cable assemblies with female 9-way micro-miniature D-type connectors can be custom made on request, at additional cost and with a longer lead time.

Specifications

Part Number	Length	Type AL	Type A
	0.5m 1m 2m 3m 5m 10m	114 115 116 117 118 119	700 701 702 703 704 705
Differential Impedance	100 Ohms Nominal @ TDR		
Mutual Capacitance	14 pF/ft Nominal		
Velocity of Propagation	71% Nominal		
Time Delay Skew (Between Pairs)	30 ps/ft Maximum		
Conductor DC Resistance	0.064 Ohms/ft Nominal at 20ºC		
Temperature Range	-10ºC to 75ºC		
Environment	Not suitable for use in a vacuum		

STAR-Dundee

STAR-Dundee Ltd.
STAR House
166 Nethergate
Dundee
DD1 4EE
Scotland, UK

+44 1382 201755
enquiries@star-dundee.com
www.star-dundee.com
@STAR_Dundee
STAR-Dundee