



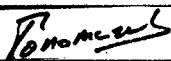

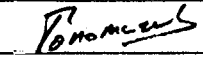
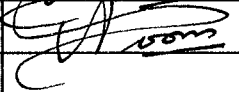
europaean space agency  
agence spatiale européenne

Pages 1 to 11

**TERMS, DEFINITIONS, ABBREVIATIONS,  
SYMBOLS AND UNITS  
FOR ELECTRICAL CONNECTORS  
ESA/SCC Basic Specification No. 2133400**



**space components  
coordination group**

Issue/Rev.	Date	Approved by	
		SCCG Chairman	ESA Director General or his Deputy
Issue 1	September 1994		
Revision 'A'	May 1995		



**SCC**

ESA/SCC Basic Specification  
No. 2133400

Rev. 'A'

PAGE 2

ISSUE 1

**DOCUMENTATION CHANGE NOTICE**

Rev. Letter	Rev. Date	Reference	CHANGE Item	Approved DCR No.
'A'	May '95	P1. Cover page P2. DCN P10. Para. 2.3.2	: Sleeve definition added	None None 23745

**SCC**ESA/SCC Basic Specification  
No. 2133400

PAGE 3

ISSUE 1

**TABLE OF CONTENTS**

	<u>Page</u>
1. <b><u>SCOPE</u></b>	<b>4</b>
2. <b><u>TERMS, DEFINITIONS AND ABBREVIATIONS</u></b>	<b>4</b>
2.1 Connector	4
2.2 General Terms	4
2.3 Specific Technical Terms	5
2.3.1 Connector Terms	5
2.3.2 Contact and Termination Terms	8
2.3.3 Accessory Terms	10

**1. SCOPE**

This specification forms part of ESA/SCC Basic Specification No. 21300, Terms, Definitions, Abbreviations, Symbols and Units, and covers electrical connectors.

Preferred terms have been given definitions, but non-preferred terms have only a cross reference back to the preferred term.

**2. TERMS, DEFINITIONS AND ABBREVIATIONS****2.1 CONNECTOR**

Connector - A component which terminates conductors for the purpose of providing connection with and disconnection from a suitable mating component. Connectors may be plugs or receptacles. A plug and a receptacle connected together form a mating set.

Fixed Connector - See Receptacle.

Free Connector - See Plug.

Plug - A connector for attachment to the end of a cable or daughter board and featuring the active part of the coupling mechanism (if any).

Receptacle - A connector for attachment to a rigid surface or mother board.

**2.2 GENERAL TERMS**

Circular - A connector which is basically cylindrical and has a mating face with a basically circular periphery.

Coaxial - A connector having conductors with a common axis. Their property is to prevent the radiation of electromagnetic interference to and from the internal conductor. The centre contact defines the "sex" of coaxial connectors.

Interchangeability - This term only applies to mating connector sets. Mating connector sets are interchangeable when they have the same performance and physical installation.

Intermateability - This term only applies to individual connectors. Connectors are intermateable when plugs and receptacles qualified to the same or different Detail Specifications are capable of being mated, guaranteeing the required performance of the mated set.

Rectangular - A connector which is basically rectangular and has a basically rectangular mating face.



Saver - A connector presenting one mating end on each side and used for preventing satellite/spacecraft flight model connectors from too many couplings and uncouplings during ground testing.

**N.B.** Not to be used in Space.

Style - A particular connector within a type, e.g. rectangular, flange-mounting.

Type - A connector within a particular subfamily, e.g. edge-socket connector, a mated set comprising a board-mounted connector and its counterpart.

## 2.3 SPECIFIC TECHNICAL TERMS

### 2.3.1 Connector Terms

Adaptor Connector - A component to permit electrical connection(s) between two or more connectors where direct connection is mechanically impossible.

Back Mounting - A component with its mounting flange behind the mounting surface when looking at the mating face or front side of the component.

Bayonet Connector - A quick disconnect connector having a bayonet coupling mechanism.

Bayonet Coupling - A quick, rotary coupling device for mating connectors, utilising projections (bayonets) riding in ramps and providing jacking and locking features with limited rotation.

Board Mounting - See PCB Connector.

Body - A connector less its contacts.

Coupling Ring - A cylindrical device used for coupling and uncoupling mating connectors.

Environmental - See Environment Resistant.

Environment Resistant - A connector provided with means for protection against moisture, temperature and contaminants.

Filter - Connector equipped with filter contacts.

Float Mount - A fixed connector with mounting means permitting movement to facilitate alignment with a mating connector.

Front - That end of a connector which is the mating face.

Front Mounting - A component with its mounting flange in front of the mounting surface when looking at the mating face or front end of the component.



Ground Plane	- A plate which is contained between 2 parts of the insert and which has tines which make contact with the capacitive elements of filter contacts or the body of grounded contacts, thereby interconnecting these elements to a common ground. It may also present a common ground between filter contacts and the shell.
Guide Pin	- A pin or rod extending beyond the mating face of a connector, designed to guide the coupling or assembly of the connector to ensure proper mating of the contacts.
Guide Post	- See Guide Pin.
Hermetic	- A connector having hermetic seals between contacts and insert and insert and housing (shell).
Hermetic Seal	- A seal is hermetic when the specified rate of leakage is several orders of magnitude smaller than that of a barrier seal.
Housing	- That part of a connector into which the insert and contacts are assembled.
Hybrid Connector	- A connector having provision for alternative contact types in discrete positions.
Insert	- An insulating element designed to support and position contacts in a connector housing.
Insert Arrangement	- See Contact Arrangement (Para. 2.3.2).
Interface	- The insert surfaces of a pair of connectors that face each other when mated. By extension, interface dimensions means dimensions of all elements (3D) that face each other on mating connectors.
Interfacial Seal	- A seal provided at the interface of connectors to prevent the ingress of moisture or contaminants when they are mated.
Jack Screw System	- A device comprising a set of captive screws and nuts used to couple and uncouple mating components. It may also provide a polarisation facility.
Key	- A projection which engages with a keyway to guide, align and possibly polarise a component during mating.
Keyway	- A slot or groove in which a key engages.
Mating End	- See Front.
Mating & Unmating Forces	- The force required to fully engage or separate a pair of mating components, including the effect of a coupling, locking or similar device.



Moulded Body	- A connector that does not have an external shell.
Mounting Flange	- A projection from a component for the purpose of attaching the component to a rigid surface.
Orientation	- The angular position of an insert within a circular shell constituting the whole or part of a connector polarising system; identification of the orientation is from a specific datum point on the interface to a specific datum on the shell, such as a major key or keyway.
Panel Seal	- A seal provided between a component and a panel.
PCB Connector	- A connector suitable for permanent attachment to a Printed Circuit Board (P.C.B.).
Peripheral Seal	- A seal at the periphery of an insert.
Polarisation	- The provision of features to ensure the correct alignment of connectors during mating and to prevent accidental mating of similar connectors.
Potting	- The sealing of the cable end of a connector with a fluid compound that sets to exclude air, moisture and contaminants.
Push-pull Connector	- A quick disconnect connector having a push-pull coupling mechanism or where mate and unmate is performed by a push-pull action.
Push-pull Coupling	- A quick, axial coupling device with self-locking and unlocking features. Unlocking is achieved by an axial pull on the coupling ring. Locking is achieved by an axial push on the coupling ring.
Quick Disconnect	- A connector fitted with a coupling device which permits relatively rapid unmating.
Rack and Panel	- 1 of 2 mating fixed connectors intended to provide a connection between a unit and its mounting rack and having an alignment device to ensure correct mating; it normally has no coupling device and is mated by the movement between the unit and the rack.
Rear	- The wiring end of a connector.
Retention Clip	- A device used to retain elements of a connector other than the contacts.
Scoop-Proof	- A connector incorporating features preventing its contacts, either male or female, from being touched by the front of the mating connector.
Sealing	- The ability of a component to resist the ingress of contaminants.

- Sealing Barrier - A seal provided between shell and insert, insert and contacts, and insert and cable insulation.
- Shell - See Housing.
- Shielded (coaxial in the case of 1 conductor) - A connector designed to prevent the radiation of electromagnetic interference to and from the internal conductor(s).
- Single Hole Mounting - A method of mounting a component which has a shoulder and a retaining device, through a single hole in a panel.
- Solder Mount - A method of mounting an hermetic receptacle to a bulkhead.
- Threaded Coupling - A means of coupling and uncoupling mating connectors by threads in a coupling ring engaged with threads on a receptacle.
- Torque - Force at a defined radius necessary to mate and unmate bayonet or thread coupling connectors, or accessory screws.
- Twist-Pull Coupling - A quick coupling device with locking and unlocking features for securing mating connectors by rotation of the coupling ring, and releasing by axial operation of the coupling ring.
- Umbilical Connector - A connector, used to connect a cable to a vehicle, that is separated automatically before or during the initial movement of the vehicle.

### 2.3.2 Contact and Termination Terms

- Barrel - The section of the contact that accommodates the conductor (normally applies to crimp contacts).
- Bucket - See Solder Bucket.
- Contact - The conductive element in a component which mates with a corresponding element to provide an electrical path.
- Contact Arrangement - The number, spacing and configuration of contacts in a connector.
- Contact Resistance - The electrical resistance of a mating set of contacts under specified conditions.
- Contact Retainer - A device, either on the contact or in the connector insert, to retain the contact in the insert.
- Crimp Contact - A contact having a barrel designed to be crimped.





Crimping	- A method of permanently attaching a termination to a conductor by pressure deformation or by reshaping the barrel around the conductor to establish good electrical and mechanical connection.
Engagement End	- That end of a contact which mates with a contact in another connector.
Engagement Force	- See Force, Engagement and Separation.
Female	- A contact intended to make electrical engagement on its inner surface and which will accept entry of a male contact.
Filter Contact	- A contact containing a filter to discriminate against certain frequencies.
Force, Engagement and Separation	- Force necessary to introduce a male contact into, or remove it from, a female contact.
Force, Insertion and Withdrawal	- The force required to fully insert or withdraw a contact into its insert cavity and lock it in place or unlock it.  <b><u>N.B.</u></b> Applicable to removable contacts only.
Front Release	- A removable contact in which release is effected from the mating face.
Inspection Hole	- A hole provided in the crimp barrel to permit visual inspection to ensure that the conductor has been inserted to the proper depth before and after crimping.
Male	- A contact having an engagement end that makes contact by insertion into the female contact.
Pin	- See Male.
Rear Release	- A removable contact in which release is effected from the rear.
Removable Contacts	- Contacts that can be installed into or removed from an insert by means of a special tooling.
Retaining Clip	- See Contact Retainer.
Retention Force	- The maximum permissible force which, if exerted axially on the contact, does not displace the contact permanently from its intended position in the insert or destroy the ability of the contact retainer to function.
Separation Force	- See Force, Engagement and Separation.



Size	<ul style="list-style-type: none"><li>- The designation used to differentiate between contacts. It may be denoted by one of the following systems:-<ul style="list-style-type: none"><li>(a) <b>Numbering System:</b> Assigned numbers used to denote the size of the contact and its related conductor (Wire Gauge) accommodation.</li><li>(b) <b>Current Rating System:</b> The related current-carrying capacity is used to denote the size of the contact.</li><li>(c) <b>Cross-sectional Area System:</b> Reference is made to the cross-sectional area of the maximum conductor accommodation to denote the size of the contact.</li></ul></li></ul>
Sleeve	<ul style="list-style-type: none"><li>- A protective cylindrical element, which is an integral part of a female contact, to prevent damage.</li></ul>
Socket	<ul style="list-style-type: none"><li>- See Female.</li></ul>
Solder Bucket	<ul style="list-style-type: none"><li>- Section of a contact that accommodates the conductor for soldering.</li></ul>
Solder Contact	<ul style="list-style-type: none"><li>- A contact designed for accepting the soldering of a conductor.</li></ul>
Solderless Connection	<ul style="list-style-type: none"><li>- A joint between conductors achieved by mechanical pressure without the use of solder or any method requiring heat, e.g. crimp joint, wrap joint.</li></ul>
Solderless Wrap Joint	<ul style="list-style-type: none"><li>- A joint achieved solely by wrapping a wire conductor around a post having sharp edges.</li></ul>
Wire Range	<ul style="list-style-type: none"><li>- The sizes of conductors accommodated by a particular contact barrel.</li></ul>
Wire Wrap Contact	<ul style="list-style-type: none"><li>- A contact designed to accept a solderless wrap joint.</li></ul>
<b>2.3.3</b> <u>Connector Accessory Terms</u>	
Accessory	<ul style="list-style-type: none"><li>- Any additional item that does not form part of the basic connector and contact.</li></ul>
Boot	<ul style="list-style-type: none"><li>- A flexible and resilient housing forming an extension to the connector body to protect and support the cable termination; it may be heat shrinkable, and may also be used as a potting form.</li></ul>
Cable Clamp	<ul style="list-style-type: none"><li>- A device or accessory attached to the connector body or to a cable outlet to support the cable or wire, provide strain relief, and absorb mechanical stress that would otherwise be transmitted by the cable to the connector terminations.</li></ul>



Cable Outlet	- An accessory consisting of a rigid housing for attachment to the connector body; it may incorporate provision for a cable clamp or seal, or for terminating screens, and may provide shielding against electrical interference.
Connector Cover	- An accessory to cover the mating end of a connector for mechanical and environmental protection.
Dust Cap	- A plastic cover which may be placed on the front end of a connector to prevent the ingress of dust or moisture during assembly and/or storage.  <b><u>N.B.</u></b> Not to be used in Space.
Ferrule	- An accessory in the form of a short tube to provide cable support or termination to a cable screen.
Filler Plug	- An accessory used to fill grommet cavities in a connector when contacts are not in place.  <b><u>N.B.</u></b> Not to be used in Space.
Grommet	- A part of a component or an accessory used to support and protect the wires or cable at the point of entry. It may also prevent the ingress of moisture or contaminants.
Grommet Follower	- An accessory used to contain the grommet.
Grommet Nut	- An accessory used to retain the grommet and follower.
Hood	- See Cable Outlet.
Outlet Nut	- An accessory that secures the cable outlet to the body of a connector.
Potting Mould	- An accessory used as a mould into which potting compound is injected.
Screw Lock Assembly	- A device used on mated connectors to ensure that they remain mated under flight conditions.
Sealing Plug	- See Filler Plug.
Shield	- See Cable Outlet.
Shroud	- An accessory that provides physical protection to otherwise exposed contacts.
Strain Relief Clamp	- See Cable Clamp.