



Connector Industry Lexicon

Positronic Industries

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One component of effective communication is a common understanding of the terminology used in the communication. Like so many other industries, the electronics industry has developed its own unique language. The following glossary contains definitions of common connector terms provided by the International Electrotechnical Commission (I.E.C.)* to aid connector users (For a complete list please visit <http://www.electropedia.org>). Also listed are definitions not yet shown in the I.E.C. document.

Glossary

When applicable, common use or slang terms are given in brackets (IE: **Term** [slang]:)

Accessory: Device supplementing a main device or apparatus, but not forming part of it, that is needed for its operation or to confer on it specific characteristics.

Adapter: Intermediate device to provide for attachments such as special accessories, special mounting means or special interconnecting means.

Alignment Bar [*pin holder, cross bar*]: Nonconductive auxiliary piece placed on contact terminations. The purpose is to keep the terminations in alignment.

American Wire Gauge [AWG]: A U.S. standard set of non-ferrous wire conductor sizes. Typical data wiring is AWG number 24, 26, or 28. The higher the gauge number, the smaller the diameter and the thinner the wire.

Back-Mounted: Pertaining to a component with its mounting flange behind the mounting surface when looking at the mating face or front side of the component.

Backward Compatibility: Feature of connectors which ensures at least the lower requirements are met when mating connectors with higher and lower requirements.

Blind Mate: A condition in which two fixed connections must mate without benefit of human manipulation to align the connectors.

Cable Adapter [*strain relief, hood, back shell*]: Connector accessory which is used on free connectors to support cable or wires and to protect contact terminations. Cable adapter may be used with other accessories such as jackscrew and quick disconnect locking systems, guides, and connector housings.

Cable Assembly [*cablized connectors*]: A finished assembly which is composed of cable, wire, connectors, terminals or other electronic or electrical components.

Cable Clamp: A mechanical device attached to the accessory threads at the rear of a plug or receptacle to support the cable or wire bundle, to provide strain relief and absorb vibration and shock which would otherwise be transmitted by the cable to the contact or wire crimp area.

Cable Shielding: A conductive foil or braid that covers insulated wires in a cable. The shield provides electrical grounding and protection from external electromagnetic interference (EMI). Shielding is also used to control internal electromagnetic radiation.

Center Conductor: The solid or stranded wire in the middle of the coaxial cable. The conductor diameter is measured by the American Wire Gauge (AWG).

Circular Connector: A connector that has a housing and/or insert that is circular in shape.

Clearance: Shortest distance in air between two conductive parts.

Coaxial Cable: A two conductor cylindrical transmission line typically comprised of a center conductor, an insulating dielectric material and an outer conductor (shielding). Coaxial cable can be flexible (typical to the assemblies found in this catalog), semi-rigid or rigid in nature.

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Glossary

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Coding Device [keying]: Means of preventing the mating of a connector to any connector other than its intended mate.

Coding Plug [keying plug]: An accessory to a connector which allows a connector pair to be coded by blocking specific contact positions.

Compatible Connectors: Connectors that are intermountable, intermateable or interchangeable.

Connection: Intentional electric contact between conductors or intentional junction between waveguides including optical fibres.

Connector Contact: The primary electrically conductive element of connectors. The contact system is comprised of a male contact and a female contact. In general, contacts are available in a wide variety of sizes. Contacts can be provided with multiple termination types, including wire crimp and solder; printed circuit board (pcb) solder, straight and right angle mount; and straight mount compliant press-in.

Connector Front: Side of a connector which is the mating face.

Connector Housing [shell]: Part of a connector into which the connector insert and contacts are assembled.

Connector Insert [insulator, molding, dielectric]: The connector insulating element which also supports and positions the contacts in the connector system. Connectors can be supplied as a free connector or a fixed connector.

Connector Interface: Two surfaces of mating connectors which face each other when mated.

Connector Rear: Side of a connector in which termination of the connector occurs.

Contact Area: area where electric contact between two contact elements occurs.

Contact Arrangement [contact variant, contact layout]: Number, spacing and configuration of contacts in a component.

Contact, Bifurcated Female [split tine]: Contact containing forked/branched contact members with one contact point on each branch.

Contact, Closed Entry Female [sleeved, PosiBand®]: Contact which has an opening that is an unbroken ring. Closed entry contacts provide a higher degree of reliability.

Contact, Coaxial: A contact with two conductive surfaces- a center contact and a surrounding coaxial sleeve.

Contact Extraction Force: Axial force required to extract a removable contact from a connector insert.

Contact, Female [socket]: Contact gender in which mechanical and electrical engagement is made on the inner surface of the contact.

Contact Float: Permitted free movement of a contact in a connector insert.

Contact Force: Normal force (90°) which exists between engaged contact surfaces providing contact pressure.

Contact, Male [pin]: Contact gender in which mechanical and electrical engagement is made on the outer surface of the contact.

Contact Resistance: Electrical resistance of a mated set of contacts under specified conditions.

Contact Sequence: Sequence in which contacts with a different mating length mate, with the purpose of providing stepped insertion forces and/or stepped electrical continuity.

Contact, Shielded: A contact shielded from unwanted signals (EMI/RFI) by one or more outer (protective) conductors. These contacts are not generally matched to the impedance of the cable they terminate.

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Contact, Size: A designation to differentiate one contact from another. Numbers are commonly used for this purpose. The designator numbers are associated with a specific male contact diameter; the smaller the designator, the larger the contact size.

Contact, Thermocouple: A contact made of special materials, used in connectors as a means of measuring temperature electrically. Materials often used for these contacts are alumel, chromel, constantan, iron and copper.

Creepage Distance: Shortest distance along the surface of a solid insulating material between two conductive parts.

Crimp Barrel: Conductor barrel designed to accommodate one or more conductors and to be crimped by means of a crimping tool.

Crimped Connection: Permanent connection made by the application of pressure inducing the deformation or reshaping of the barrel around the conductor of a cable.

Crimping: 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.

Crimping Zone: Part of a crimp barrel where the crimped connection is achieved by pressure deformation or reshaping the barrel around the conductor.

Cycle of Operation [mating cycle]: One insertion and one withdrawal of connector halves.

D-subminiature Connector: A rectangular connector which has a housing that is "D" shaped. The "D" shape is used as a polarizing feature.

Effective Press-in Length: Length of contact between the press-in zone of a press-in termination and the metal plating of the plated-through hole in a printed board in which the press-in termination is inserted.

Electrical Engagement Length [wipe length, contact wipe, electrical engagement]: Distance a contact glides on the surface of its mating contact during engagement or separation.

Electromagnetic Interference [EMI]: Electrical or electromagnetic energy that causes unwanted responses in electronic equipment.

Engaging Force: Force required to engage fully a pair of mating components including the effect of a coupling, locking or similar device.

Extraction Tool [removal tool]: Device for extracting removable contacts from a component.

Female Connector: A connector which utilizes female contacts.

First Mate/Last Break Contacts: Contacts which provide different contact levels and sequencing. NOTE – During connector module engaging (insertion), at least one contact of the higher level shall connect before any contact of a lower contact level; while during connector module disengaging (withdrawal), at least one contact of the higher level will not disconnect before any contact of a lower contact level.

Fixed Board Connector: Connector mounted on a mother board or back plane, for engagement with a free cable connector and/or free board connector.

Fixed Cable Connector [bulkhead mount, panel mount]: Connector mounted to a rigid surface for attachment to wire or cable.

Fixed Connector: The portion of connector system designed for attachment to a rigid surface.

Fixed Jackscrew [jack post]: The portion of a jackscrew system that does not rotate.

Float Mounting: Mounting method permitting movement to facilitate alignment of two mating components.

Float-Mounting Connector: Fixed connector with mounting means permitting movement to facilitate alignment with the mating connector.

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Glossary

When applicable, common use or slang terms are given in brackets (IE: **Term** [slang]:)

Free Board Connector: Connector mounted on a printed board which can be separated from a mother board or back plane, for engagement with a free cable connector and/or free board connector.

Free Cable Connector [*Free Connector*]: Connector for attachment to the free end of a wire or cable.

Front Mounted: Pertaining to a component with its mounting flange in front of the mounting surface when looking at the mating face or front side of the component.

Front Release: A term indicating the direction the contact removal tool must enter the connector to allow for the removal of contacts. On a front release connector, the contact removal tool must be inserted in the contact cavity from the front or face of the connector to release the contact retention clip. Whether front release or rear release, the contacts are inserted from the rear of the connector.

Front Release Contact: Removable contact in which release is effected from the mating face.

Grommet: A resilient elastomeric seal bonded to the rear of a connector. It is designed with internal sealing barriers that grasp and seal on the wire's insulation to prevent contaminants from entering into the rear of the connector.

Ground: Any zero-voltage point. Earth is considered a zero voltage grounding point.

Ground Wire [*Drain Wire*]: An extra conductor (usually a bare wire) added to a cable for connection of the grounding path.

Guide Pin: A pin, rod or projection extending beyond the mating face of a component designed to guide the mating of the component to ensure proper alignment of the contacts.

Guide Socket: A Socket which receives a guide pin designed to guide the mating of the component to ensure proper mating alignment of the contacts.

High Density Connector: A connector having its pins arranged close together without compromising system performance.

Insertion Force: Force required to fully insert a set of mating components without the effect of a coupling, locking or similar devices.

Insertion Tool: Device used to insert contacts into a component.

Inspection Hole: A hole at the bottom of the contact wire barrel to permit visual inspection to ensure that the wire has been inserted to the proper depth in the wire barrel prior to crimping.

Insulation Support: Part of a terminal which accommodates but does not secure the cable insulation

Interchangeable: Pertaining to a component when all elements guarantee compliance of electrical, mechanical and climatic performance of mated connectors when individual connector halves are from different sources. This is the highest level of compatibility. See also "Intermateable" and "Intermountable"

Interface: The two surfaces on the contact side of a mating plug and receptacle. The surfaces will face each other and interface when mated.

Interfacial Seal: The sealing of mating connectors over the entire area of the interface and around each contact. This is accomplished when resilient material, with raised barriers around each cavity on the pin interface, displaces into the hard recessed (chamfered) cavities on the socket interface. This creates what is commonly called "cork and bottle seal".

Intermateable: Pertaining to each of two components when they feature identical dimensions for electrical and dimensional interfaces.

Intermountable: Pertaining to each of two components when their overall dimensions, dimensions on printed board or panel cut-out, and cable termination are identical.

Jackscrew System: A locking device which uses the mechanical advantage of threaded coupling to couple and uncouple connector pairs. The system consists of a fixed jackscrew and a rotating jackscrew. Jackscrew systems can also be used as a coding device for connectors.

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Locking Device: An accessory that provides mechanical retention of mated connectors.

Lockout: A feature of fixed, female, threaded hardware that minimizes the possibility of rotation of male rotating hardware once the system is coupled.

Lower Limiting Temperature: Value within a connector specification, smallest admissible value of the temperature at which the connector, as defined by the climatic category, is intended to operate.

Male Connector: A connector which utilizes male contacts.

Mate: The joining of two connectors.

Mated Pair: A plug and receptacle joined or to be joined together.

Mounting Bracket: Connector accessory used to mechanically fix a connector to a mounting surface.

Mounting Flange: Projection from a component for the purpose of attaching the component to a rigid surface

Mounting Plate: Plate for mounting electronic and electrical devices

O-Ring: Also referred to as peripheral seal; is used around the periphery of a connector shell and is compressed internally between the plug and receptacle shells when mated to prevent contaminants from entering the connector.

Over-Voltage: A condition in which voltage exceeds a specified limiting value of a component.

Panel Cut-Out: Hole or group of holes cut in a panel or chassis for the purpose of mounting a component.

Polarization: Integral feature within a connector system to ensure corresponding male and female contacts are engaged when the connectors are mated.

Polarizing Plug: An accessory to a connector which allows a connector pair to be polarized by blocking specific contact positions.

Power Connector: A connector in which part or all of its contacts are used to supply power to a component or device. Current rating is relevant to the application.

Press-in Connection: Solderless connection made by inserting a press-in termination into a plated-through hole of a printed board.

Press-in Connection, Compliant: A press-in connection in which the termination “complies” to the shape of a plated-through hole.

Press-in Zone: Specially shaped section of a press-in termination which is suitable for the press-in connection.

Printed-Board Connector: Connector specifically designed to facilitate connections to printed boards.

Pull Test: Tensile test: a controlled pull test on the contact crimp joint to determine its mechanical strength.

Push Fastener[board lock]: An accessory to a PCB mount connector allowing rapid insertion and securing of the connector prior to the soldering operation.

Quick Disconnect Connector: Connector fitted with a coupling device which permits relatively rapid unmating.

Quick Disconnect Coupling: Type of coupling device which permits relatively rapid uncoupling.

Quick Disconnect Locking Device: Device which allows for rapid connects and disconnect of connector pairs. Many systems consist of fixed lock tabs and actuation levers.

Rated Current: The amount of electrical current flowing through a connector or connector contacts expressed in terms of a specified set of conditions or test method. A component’s current rating is used as an aid in specifying the components use as part of an electrical system.

Rear Release Contact: Removable contact in which release is effected from the rear.

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Glossary

When applicable, common use or slang terms are given in brackets (IE: **Term** [slang]:)

Rectangular Connector: A connector that has a housing and/or insert that is rectangular in shape.

Right Angle PCB Mount: The relative position of PCB termination when the terminations are at a right angle to the mating position of the contact.

Rotating Jackscrew [screw lock]: The portion of a jackscrew system that rotates.

Sealing Plug: An accessory to environmental connectors which allows a connector user to seal specific contact locations that will not have contacts inserted.

Separating Force: Force required to separate fully a pair of mating components including the effect of a coupling, locking or similar devices.

Solder Contact: Contact designed for the attachment of the conductor by solder. NOTE – Solder contacts may assume but are not limited to the following types: a) the wire is surrounded by the terminal, barrel, bucket, cup, well, etc., b) the wire surrounds the terminal: post, standoff, tag etc, c) the wire passes through the terminal: eyelet, hook, etc., d) no wire is involved, as in printed circuit applications: solder pin post, SMT terminations (e.g. gull wings) spill, tail, etc.

Soldered Connection: Connection made by soldering.

Solderless Connection: Connection achieved by mechanical means.

Spacer: An accessory that is used to control the distance from and secure a connector to its mounting surface.

Straight PCB Mount: The relative position of PCB terminations when the terminations are a linear extension of the mating portion of the contacts.

Terminal: Conductive part of a device, electric circuit or electric network, provided for connecting that device, electric circuit or electric network to one or more external conductors.

Termination Point [termination, termination type]: Part of a contact, terminal of a contact, terminal or terminal end to which a conductor is normally attached.

Threaded Coupling: Means of coupling by engaging screw threads present on the mating components.

Under Load: The condition of a component when current is flowing through the component during normal use.

Upper Limiting Temperature: Value within a connector specification, greatest admissible value of the temperature at which the connector, as defined by the climatic category, is intended to operate.

Voltage Standing Wave Ratio [VSWR]: Amount of reflected power expressed as a ration (Ex: 1.25:1). VSWR increases as frequency increases.

Withdrawal Force: Force required to fully withdraw a set of mating components without the effect of a coupling, locking or similar device.

Withstand Voltage [breakdown voltage, dielectric strength]: Value of the test voltage to be applied under specified conditions in a withstand test, during which a specified number of disruptive discharges is tolerated. The withstand voltage is designated as: a) conventional assumed withstand voltage, when the number of disruptive discharges tolerated is zero. It is deemed to correspond to a withstand probability PW = 100 % (this is in particular the case in the low-voltage technology); b) Statistical withstand voltage, when the number of disruptive discharges tolerated is related to a specified withstand probability, for instance PW = 90 %.

Working Voltage: highest permissible AC value (specified in volts, r.m.s.) or highest DC value (specified in volts) across any particular insulation which can occur when the equipment is supplied at rated voltage.

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Connector Excellence[®]

Positronic HIGH RELIABILITY Products

POWER



FEATURES:

- High current density
- Energy saving - low contact resistance
- AC/DC operation in a single connector
- Signal contacts for hardware management
- Blind mating
- Sequential mating
- Large surface area contact mating system
- Wide variety of accessories
- Customer-specified contact arrangements
- Modular tooling which produces a single piece connector insert

Contact Sizes: 0, 8, 12, 16, 20, 22 and 24
Current Ratings: To 200 amperes per contact
Terminations: Crimp and panel mount, straight solder, right angle (90°) solder, straight compliant press-in and right angle (90°) compliant press-in

Configurations: Multiple variants in a variety of package sizes
Compliance: PICMG 2.11, PICMG 3.0, VITA 41, DSCC, GSFC S-311-P-4, GSFC S-311-P-10

D-SUBMINIATURE



FEATURES:

- Four performance levels available for best cost/performance ratio: professional, industrial, military and space-flight quality
- Options include high voltage, coax, thermocouple and air coupling contacts; environmentally sealed and dual port connector packages including mixed density
- Broad selection of accessories
- Size 20 and 22 contacts suitable for use in carrying power
- IP65, IP67

Contact Sizes: 8, 16, 20 and 22
Current Ratings: To 100 amperes
Terminations: Crimp, wire solder, straight solder, right angle (90°) solder, straight compliant press-in and right angle (90°) compliant press-in

Configurations: Multiple variants in both standard and high densities, seven shell sizes
Qualifications: MIL-DTL-24308, GSFC S-311-P-4, GSFC S-311-P-10, SAE AS39029, DSCC

RECTANGULAR



FEATURES:

- Two performance levels available: industrial quality and military quality
- A wide variety of accessories
- Broad selection of contact variants and package sizes
- Connector keying options

Contact Sizes: 16, 20 and 22
Current Ratings: To 13 amperes nominal
Terminations: Crimp, wire solder, straight solder, right angle (90°) solder, and straight compliant press-in

Configurations: Multiple variants in both standard and high densities, thirty package sizes
Qualifications: MIL-DTL-28748, SAE AS39029, CCITT V,35

CIRCULAR



FEATURES:

- Non-corrodible / lightweight composite construction
- EMI/RFI shielded versions
- Thermocouple contacts
- Environmentally sealed versions
- Rear insertion/ front release of removable contacts
- Two level sequential mating
- Overmolding available on full assemblies

Contact Sizes: 12, 16, 20 and 22
Current Ratings: To 25 amperes nominal
Terminations: Crimp, wire solder, straight solder, and right angle (90°) solder

Configurations: Multiple variants in four package sizes
Qualifications: Environmental protection to IP67

CABLE



FEATURES:

- Shorten the supply chain and reduce additional costs and delays by "cablizing" your Positronic connector selection
- Overmolding available
- Shielded and environmentally sealed versions available
- Power cables and access boxes which meet the SAE J2496 specification

- ✓ Design assemblies in accordance with customer specifications.
- ✓ Prepare cablized connector configuration and performance specifications.
- ✓ Design each system in accordance with applicable customer, domestic, and international standards.
- ✓ Define and conduct performance and verification testing.

HERMETIC



FEATURES:

- Intended for use as an electrical feedthrough in high vacuum applications
- Leakage rate: 5 x 10-9 mbar.l/s @ vacuum 1.5 x 10-5 atm
- Signal, power, coax and high voltage versions available
- Connectors can be mounted on flange assembly per customer specification

Contact Sizes: 8, 12, 16, 20 and 22
Current Ratings: To 40 amperes nominal
Terminations: Feedthrough is standard; flying leads and board mount available upon request

Configurations: See D-subminiature and circular configurations above
Compliance: Space-D32

For more information, visit www.connectpositronic.com or call your nearest Positronic sales office listed on the back of this catalog.