



## A Review Paper on Cable Connectors

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**Abstract**— This paper is an attempt to give a basic knowledge of cable connectors to the user.

**Keywords**— Cable glands, RJ 45 Connector, Banana Connector, BNC Connector, XLR Connector

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### I. INTRODUCTION

An electrical connector is an electro-mechanical device for joining electrical circuits as an interface using a mechanical assembly. Connectors consist of plugs (male-ended) and jacks (female-ended). In computing, an electrical connector can also be known as a physical interface.

### II. PROPERTIES OF CONNECTORS

Electrical connectors are characterized by their pin out and physical construction, ruggedness and resistance to vibration, resistance to entry of water or other contaminants, resistance to pressure, lifetime. They may be keyed to prevent insertion in the wrong orientation. It is usually desirable for a connector to be easy to identify visually, rapid to assemble, and be inexpensive. No single connector has all the ideal properties.

**Cable Glands:** Cable glands known as cable connectors, connect wires to devices mechanically rather than electrically and are distinct from quick-disconnects. They are mechanical cable entry devices and can be constructed from metallic or non-metallic materials. They are used in conjunction with cable and wiring used in electrical instrumentation and automation systems. They are used as a ceiling and a termination device to insure that the characteristic of the enclosure which the cable enters can be contained adequately. The cable glands are made of mainly Plastic, Brass, Aluminum, and Stainless Steel[1].

### III. TYPES OF CONNECTORS

#### **RJ-45 Connector:**

The Registered Jack-45 is a standard type of connector for network cables. The connector is used for a range of physical layer specification one of which is Ethernet. RJ-45 Connector is the male component and the Socket is the female component in the network device. RJ-45 Connectors features 8 pins to which wire strands of a cable interface electrically. Standard RJ-45 pin outs define the arrangement of the individual wire needed when attaching connectors to a cable. The “45” simply refers to the no. of interface standard. It looks similar to a telephone jack but is slightly wider. The 8 wires present at each end of the Ethernet cable out of which 4 are solid and 4 striped. RJ-45 cables can be wired in two different ways: one version is T-568A & the other is T-568B (most commonly used). Crossover Ethernet cable has T-568A has on one end & the T-568B on the other end which is used for direct computer to computer connection.

#### **RJ-45 Splitter:**

Used for joining the LAN cables or adding the branch cable. Great for use with cat 6, cat 5, cat 5e network cables.

#### **BNC Connector: Bayonet Neil-Concelman or Baby N Connector**

This connector is a miniature quick connect/disconnect radio frequency connector used for coaxial cable. The BNC uses a slotted outer conductor and some plastic dielectric on each gender connector. The BNC connector is used for signal connections such as analog and serial digital interface video signals, amateur radio antennas, aerospace electronics & test equipment.

#### **Uses of BNC Connector:**

The BNC was designed for military purposes and has gained wide acceptance in video and RF applications to 2 GHz. The BNC connector is used for composite video on commercial video devices. BNC connectors were commonly used on 10base2 thin Ethernet network cables and network cards. BNC connections can also be found in recording studios.

#### **BNC Inserter/Removal Tool:**

A BNC inserter/remover tool is also called a BNC tool, BNC extraction tool, BNC wrench, or BNC apple corer. It is used to insert or remove BNC connectors in high density or hard-to-reach locations. BNC tools are usually light weight, made with stainless steel. They help to safely, efficiently and quickly connect and disconnect BNC connectors in jack fields. BNC tools facilitate access and minimize the risk of accidentally disconnecting nearby connectors.

### **XLR connector:**

The XLR connector is an electrical connector, primarily found on professional audio, video, and stage lighting equipment. The connectors are circular in design and have between 3 and 7 pins. They are most commonly associated with balanced audio interconnection, including other applications. They are superficially similar to the older and smaller DIN connector range, but are not physically compatible with them. A smaller version, the Mini XLR Connector, is used where physical size is important, but as yet has not gained such wide acceptance[2].

### **Patterns & Applications**

Three-pin: XLR connectors are by far the most common style, and are an industry standard for balanced audio signals. The great majority of professional microphones use the XLR connector; it provides a better shield for the contacts, which may carry dangerous voltages when connected to an amplifier. They are used to interconnect powered speakers with line-level signals, which are commonly seen in PA system applications and seems to be growing more common. Rechargeable devices exist that use three-pin XLR connectors. These can be found on electric powered mobility wheelchairs and scooters.

Four pin: Four pin XLR connectors are used as the standard connector for intercom headsets, such as systems made by Telex.

Five pin: Five pin XLR connectors are used as dual-element or stereo microphones and stereo intercom headset.

Six pin: Six pin XLR connectors are used for dual channel intercom systems, and stage lighting control applications.

Seven pin: Seven pin XLR connectors are used to connect some valve (tube) condenser microphones to their power supplies.

### **Banana Connector:**

A banana connector is a single-wire electrical connector used for joining wires to equipment. The plug is typically a four-leafed spring tip that fits snugly into the jack. The plugs are frequently used to terminate patch cords for electronic test equipment. They are also often used as the plugs on the cables connecting the amplifier to the loudspeakers in hi-fi sound systems.

### **Derived Plugs**

Plugs are based on combining 2 or more banana plugs with a plastic handle and other features for ease of use and to prevent accidental insertion in other such plugs. Many of these plugs are derived from the double banana plug consisting simply of two banana plugs.

MINIATURE BANANA CONNECTORS: A miniaturized version of the banana connector is about 1/3 the size of the standard connector, these were useful in high-density applications. They are substantially more fragile than the larger connectors. Multiple miniature banana connectors are usually spaced on 1/2 inch centers.

### **Twist- on wire connector:**

Twist-on wire connectors are a type of electrical connector used to fasten two or more low-voltage (or extra-low-voltage) electrical conductors. They are widely used in North America, but are not approved for uses on low-voltage wiring in countries in other countries. Twist-on connectors are also known as wire nuts, cone connectors, or thimble connectors. Twist-on wire connectors are commonly color-coded to indicate the connector size and, hence, their capacity. They are commonly used as an alternative to terminal blocks, since they are quicker to install.

### **Crimp-On Connector:**

A crimp connection is achieved with a type of solder less electrical connector. Simple crimp connectors are typically used to terminate stranded wire. Specialized crimp connectors are also used, for example as signal connectors on coaxial cables in applications at high radio frequencies (VHF, UHF).

#### **RF Connector:**

Radio Frequency Connector. It is an electrical connector designed to work at radio frequencies in the multi-megahertz range. RF connectors are typically used with coaxial cables and are designed to maintain the shielding that the coaxial design offers. It is an extensive line of RF coaxial connector used in wireless telecommunication applications, including Wi-Fi, PCs, radio, computer networks, test instrument and antenna devices.

DIN Connector: A DIN connector is suitable with multiple conductor wires for interconnecting audio and computer accessories

Optical Fibre connector: An optical fibre connector terminates the end of an optical fibre, and enables quicker connection and disconnection than splicing. The connectors mechanically couple and align the cores of fibres so light can pass.

PHONE: Phone connectors can be used as connectors in microphone cables and for low-voltage, low-current applications.

Tee: A Tee connector is an electrical connector that connects three cables together.

RCA: RCA connectors can be used in audio connections [3].

#### **IV. CONCLUSION**

There is a wide variety of cable connectors available in the market. So, it is important for a user to make an informed decision on which connector to choose.

#### **REFERENCES**

- [1] Charles E. Spurgeon, *Ethernet Media systems, Ethernet: The Definitive* , Second Edition , O'Reilly Media, 2000.
- [2] (2016), [www.cablesandconnectors.com](http://www.cablesandconnectors.com)
- [3] (2016) connector-guides, [www.cablestogo.com](http://www.cablestogo.com)