# 6 Questions to Ask When Buying RJ45 Patch Cables

## 1. What kind of cable?

**Stranded (Most Popular)**
Mostly used for patch cables where flexibility is important. Should not be used for cable lengths longer than 25 feet.

**Solid**
Generally used as horizontal cables going inside the wall, not for patch cables shorter than 25 feet due to the inflexibility of solid conductor — although performance characteristics are better.

## 2. How will it be wired?

**Straight-thru (Most Popular)**
The straight-thru or pin-to-pin wiring method is the most common way to terminate patch cables (see Modular Cables Wiring Reference).

**Crossover**
This method of wiring is used in PC-to-PC or device-to-device applications such as hub-to-hub or peer-to-peer connections. **For Example:** "Transmit Pair 1" is sent to "Receive Pair 1" and "Transmit Pair 2" is sent to "Receive Pair 2"

## 3. What is the performance rating?

**Category 7** Proposed new STP standard with frequency requirements in the range of 500-550MHz

**Category 6** Proposed new UTP standard with extended frequency requirements of 250MHz

**Category 5e** TIA/EIA enhanced Cat5e standard, for full-duplex operation at the 100MHz, bandwidth capable of transmitting data at 1 Gbps.

**Category 5** TIA/EIA CAT5 standard, for half-duplex operation at the frequency requirements of 100MHz, capable of transmitting data at 100 Mbps

**Category 4** Data rates to 20Mbps; now obsolete

**Category 3** Data rates to 16Mbps; primarily used for voice but can be used for10Base-T

## 4. What kind of jacket?

**PVC (Polyvinal Chloride)**
Jacket material of patch cables and horizontal cable in non-plenum areas. Generally feels more flexible and is slightly thicker than Plenum jacket.

**Plenum**
The technical term for the space above the suspended ceiling when it is used to return air from ventilated spaces such as offices to heating and air conditioning equipment. To simplify construction, ceiling spaces are often used as air-return plenums in office and other buildings. Plenum cable meets rigid electrical and building code requirements for low smoke generation and low flame spread, It is typically 2-3 times more expensive than PVC cable.

## 5. What gauge wire?

Wire gauge is the measurement of the diameter of the conductor. The larger the diameter, or the less the gauge, the more capacity (amperage) the wire has for carrying current. The most popular gauge for UTP cable is 24 AWG.

- 22 AWG
- 24 AWG (Most Common)
- 26 AWG
- 28 AWG (Silver Satin)

## 6. Do you need shielded or unshielded cables?

**UTP**
Unshielded Twisted Pair cable is the most common in North America. It is relatively inexpensive. UTP is 100 Ohm in impedance.

**ScTP**
Screened Twisted Pair cable provides EMI/RFI protection via an overall foil and/or braided shield. Popular in Europe and more expensive than UTP. ScTP is 100 Ohm in impedance.

**STP**
Shielded Twisted Pair has individually shielded twisted pairs and an overall foil/braid shield. STP is 150 Ohm in impedance.

## What if you experience problems with the cables?

**No Signal**
**The most common reason for signal loss in a modular cable is crimp problems.** Either the pins did not penetrate the wire jacket properly, or the pin configuration was wrong. Re-crimping with a quality crimp tool and following the correct wiring pattern (see Modular Cables Wiring Reference) usually resolves this type of failure.

Another possible reason for failure of this type is a break somewhere in the cable. Replacing the whole cable is the simplest solution.

**Intermitant Signal**
These failures are caused mostly by wrong pin configuration (i.e., a straight-thru cable not following T568A or T568B wiring pattern), or a poor crimp job. Re-crimping the cable correctly will be the best way to resolve the problem.

## Glossary of Terms

**568A** The Commercial Building Telecommunications Cabling Standard also known as TIA/EIA-568A. The same expression is also used to refer to a wiring pattern in which the green and orange pairs are reversed against the 568B wiring pattern.

**568B** A cabling wiring standard also known as ATT 258A, invented by AT&T. Electrically, pairing between 568A and 568B is identical, the difference is the orange and green pairs are reversed between the two.

**Attenuation** The loss of signal strength which is expressed in decibels per unit length in cables.

**Backbone Cabling** Cable and connecting hardware that runs between wiring closets, equipment rooms, and entrance facilities. It is usually made of high-grade copper or fiber optic cables.

**Decibel** A unit of measurement expressing transmission gain or loss as derived from a ratio of signal amplitudes or power.

**Gbps** Gigabits per second. A term used to describe a billion bits of data transmitted over a medium.

**Horizontal Cabling** Cabling between wall outlets and telecommunication closets.

**Impedance** A measurement for AC resistance. Impedance for UTP cable is 100 Ohm, and 150 Ohm for STP.

**Mbps** Megabits per second. A term used to describe a million bits of data transmitted over a medium.

**MMJ** Exclusive wiring pattern for DEC equipment. MMJ stand for Modified Modular Jack which incorporates an offset design preventing the accidental connection of telco cables into data outlets.

**Modular Jack** A female connector typically mounted in a fixed location and may have 2, 4, 6, 8, or 10 positions.

**Near-end Crosstalk** The undesirable signal picked up from an adjacent pair at the same end where the signal is transmitted.

**Patch Panel** A cross-connect system of mateable connectors that facilitates administration.

**Return Loss** Noise or interference caused by impedance mismatch along the transmission line.

**Token Ring** Originally designed by IBM using 150 Ohm shielded twisted pair cable. The higher cost and lower performance of this type of cabling have made it increasingly less popular than UTP Ethernet.

**Trunk** A communication line between two switching systems.

**USOC** Stands for Universal Service Ordering Code. It is mostly used for voice applications.

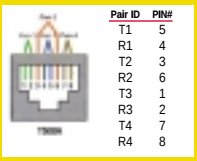
## Technical support?

**800-2-BELKIN**

## Web Assistance?

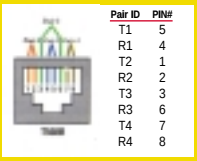
**belkin.com/support/tech**

# Modular Cables Wiring Reference



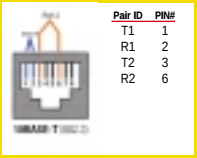
| Pair ID | PIN# |
|---|---|
| T1 | 5 |
| R1 | 4 |
| T2 | 3 |
| R2 | 6 |
| T3 | 1 |
| R3 | 2 |
| T4 | 7 |
| R4 | 8 |

**568A Wiring**
This is the wiring pattern developed by EIA/TIA, it is also for CAT5 and above applications.



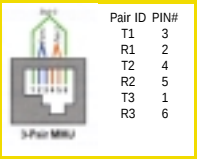
| Pair ID | PIN# |
|---|---|
| T1 | 5 |
| R1 | 4 |
| T2 | 1 |
| R2 | 2 |
| T3 | 3 |
| R3 | 6 |
| T4 | 7 |
| R4 | 8 |

**568B Wiring**
This is also known as ATT 258A wiring. It is adopted by EIA/TIA 568A standard, for CAT5 and above applications.



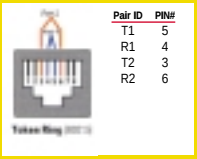
| Pair ID | PIN# |
|---|---|
| T1 | 1 |
| R1 | 2 |
| T2 | 3 |
| R2 | 6 |

**10Base-T (802.3)**
10Base-T wiring pattern uses only two pairs on an 8-position jack.



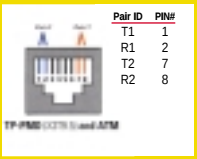
| Pair ID | PIN# |
|---|---|
| T1 | 3 |
| R1 | 2 |
| T2 | 4 |
| R2 | 5 |
| T3 | 1 |
| R3 | 6 |

**MMJ Wiring**
MMJ is the wiring pattern for DEC equipment.



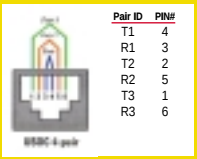
| Pair ID | PIN# |
|---|---|
| T1 | 5 |
| R1 | 4 |
| T2 | 3 |
| R2 | 6 |

**Token Ring (802.5)**
This was developed by IBM for Token Ring networks. It can be either a 6- or 8-position jack.



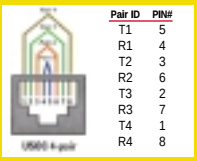
| Pair ID | PIN# |
|---|---|
| T1 | 1 |
| R1 | 2 |
| T2 | 7 |
| R2 | 8 |

**TP-PMD (X3T9.5)**
ANSI X3T9.5 TP-PMD wiring is also used for ATM applications.



| Pair ID | PIN# |
|---|---|
| T1 | 4 |
| R1 | 3 |
| T2 | 2 |
| R2 | 5 |
| T3 | 1 |
| R3 | 6 |

**USOC 3-Pair**
This wiring pattern is used for telephone applications. It is available for 1-,2-,3-, or 4-pair systems.



| Pair ID | PIN# |
|---|---|
| T1 | 5 |
| R1 | 4 |
| T2 | 3 |
| R2 | 6 |
| T3 | 2 |
| R3 | 7 |
| T4 | 1 |
| R4 | 8 |

**USOC 4-Pair**
This wiring pattern is used for telephone applications. It is available for 1-,2-,3-, or 4-pair systems.

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