

## Practical 1

### Aim:

Study process of preparation Ethernet Cable RJ45

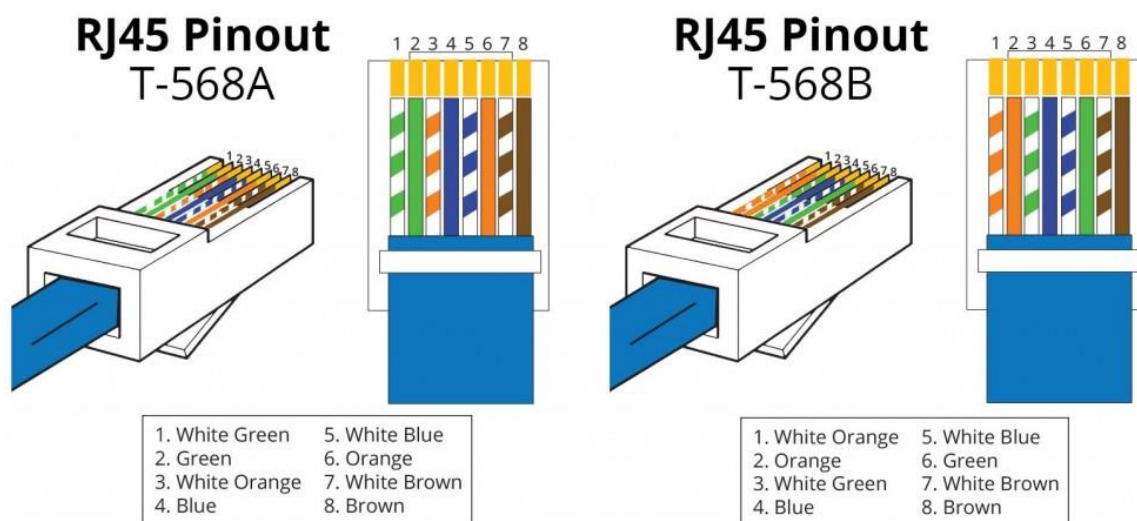
### RJ45 Ethernet Cable:

#### Introduction

RJ45 interface is the most common twisted-pair connector for Ethernet cables and networks. “RJ” means “registered jack”, which is a standardized telecommunication network interface for connecting voice and data equipment to a service provided by a local exchange carrier or long distance carrier. The physical connectors that registered jacks use are mainly the modular connector and 50-pin miniature ribbon connector types. RJ45 connector is an 8-position, 8-contact (8P8C) modular plug and jack, which is commonly used to connect computers onto Ethernet-based local area networks (LAN). RJ45 cable plug is usually made of a plastic piece with eight pins on the port. Four of the pins are used for sending and receiving data, and the other four are used for other technologies or power networking devices.

#### Colour Code

As we all know, there are two wiring schemes: T568A and T568B, which are used to terminate the twisted-pair cable onto the connector interface. Two standards define how the RJ45 pinouts to arrange the individual eight wires when linking RJ45 connector to a cable. These wiring layouts have their own colour convention, and following the convention is important to ensure electrical compatibility. The differences of T568A and T568B in colour conventions are shown in the figure below.



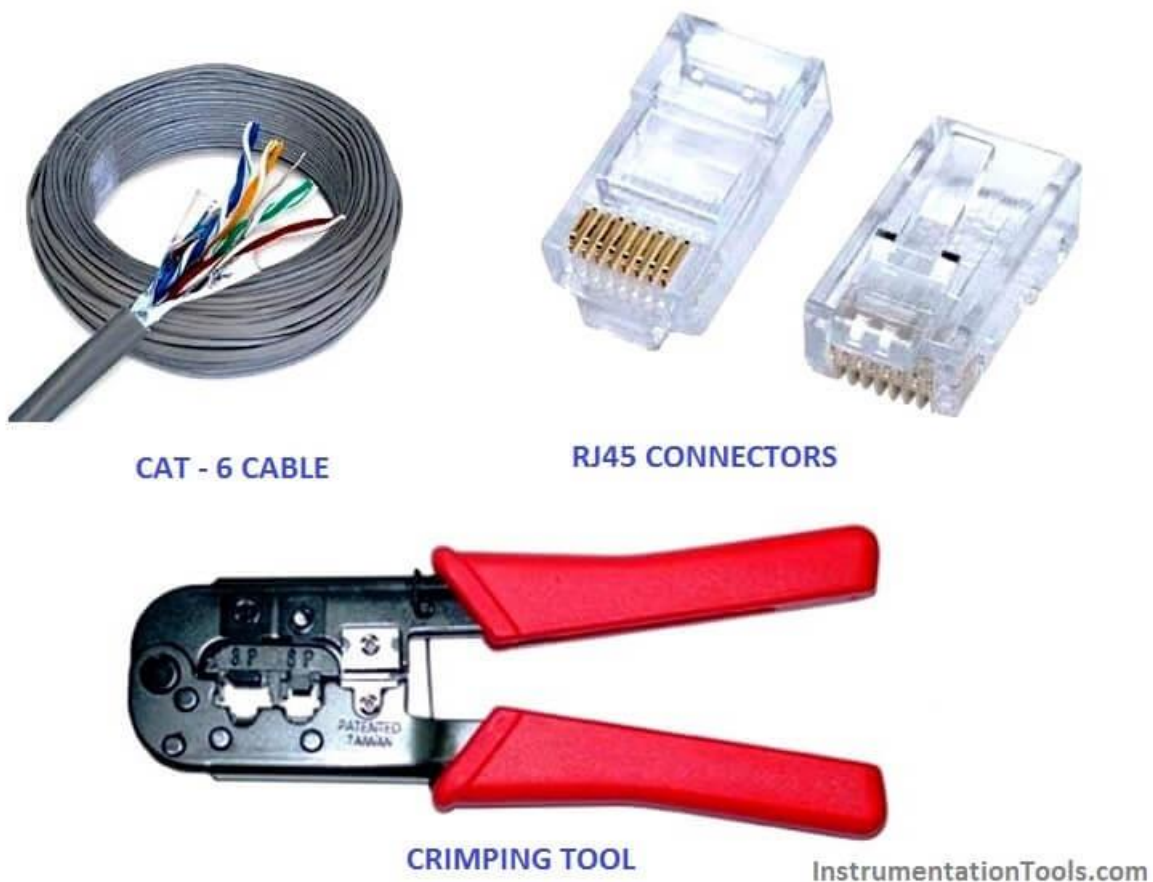
With regard to the two standards, there are two different connectivity forms. The T-568B wiring scheme is by far the most common, though many devices support the T-568A wiring scheme as well. If both ends of the patch cords are wired on the basis of one standard, it is a straight through connection. Both the standards can be used for straight through cable. If not, it is a crossover connection. Some networking applications require a crossover Ethernet cable, which has a T-568A connector on one end and a T-568B connector on the other. This type of cable is typically used for direct computer-to-computer connections when there is no router, hub, or switch available.

### How to make RJ45 cable

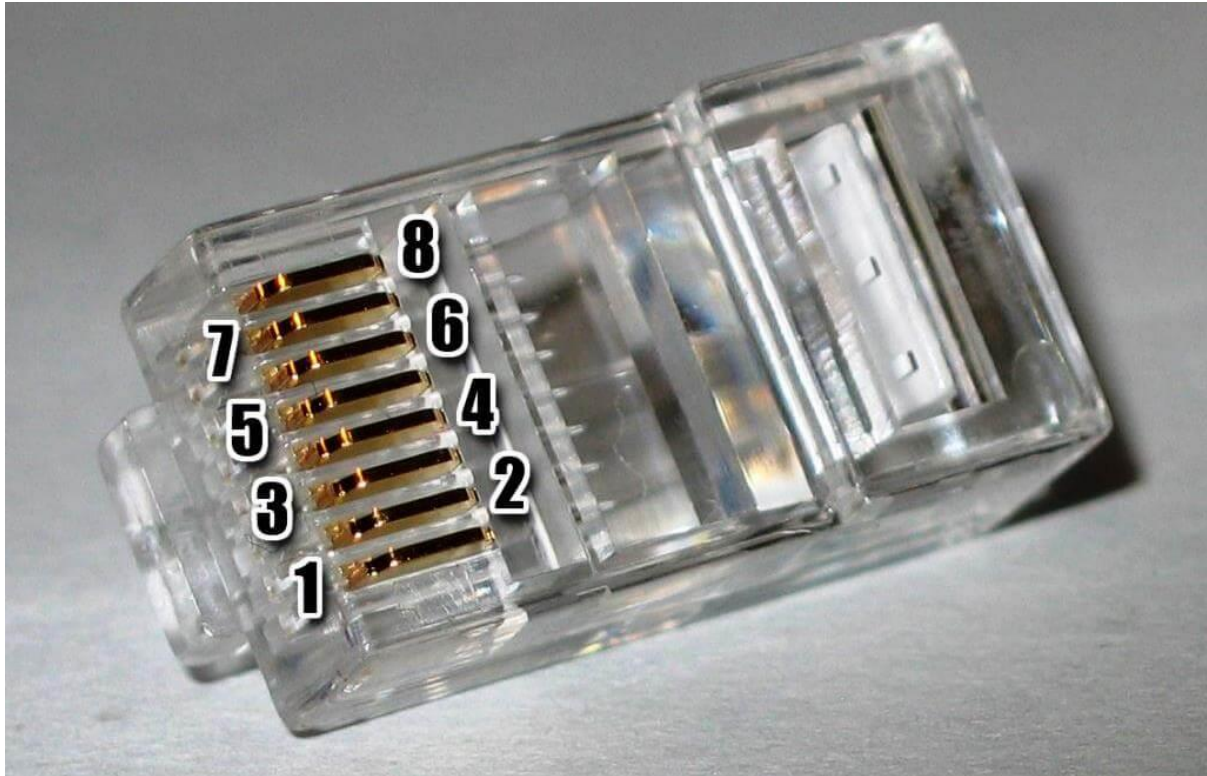
RJ45 cable is used for connect the ALL HMI and engineer station through a switch to communicated each other. It is used to download the any modification and which is made in graphics in engineering station. RJ45 cable also used for communicate the printer with computer.

#### Required tool and materials:

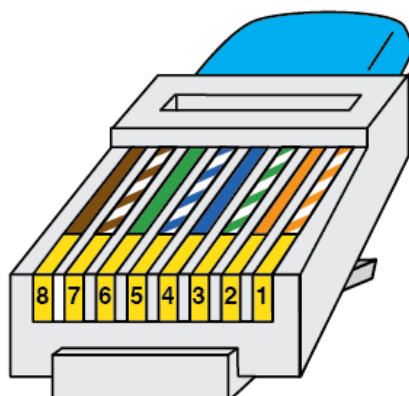
1. Ethernet Cable – Category 5e or CAT5e or CAT6
2. RJ-45 Crimping tool
3. RJ45 Crimp able Connectors



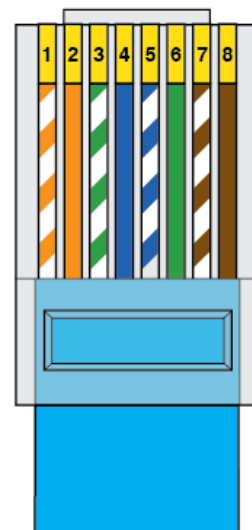
**Introduction:** There are four pairs of wires in an Ethernet cable, and an Ethernet connector (8P8C) has eight pin slots. Each pin is identified by a number, starting from left to right, with the clip facing away from you.



### RJ45 PINOUT T-568B



- 1 | White/Orange
- 2 | Orange
- 3 | White/Green
- 4 | Blue
- 5 | White/Blue
- 6 | Green
- 7 | White/Brown
- 8 | Brown

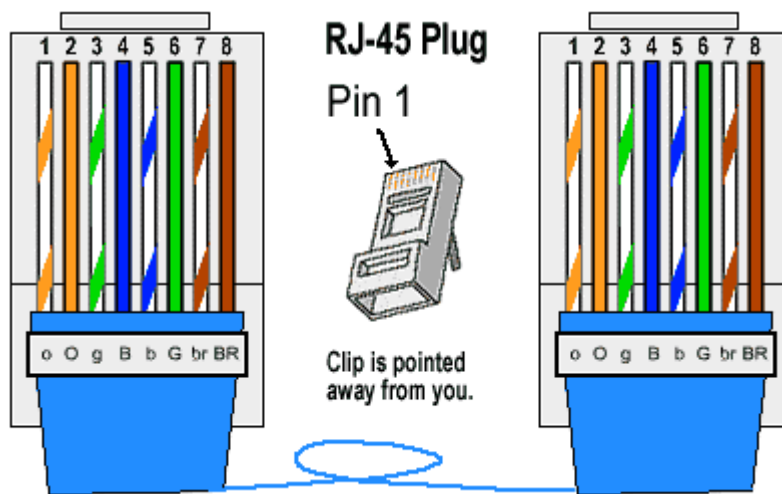


There are two kinds of Ethernet cable is used for communication.

1. Straight Through
2. Cross over cable

### **Straight Through cable:**

STRAIGHT THROUGH Ethernet cables are the standard cable used for almost all purposes, and are often called “patch cables”. It is highly recommend you duplicate the colour order as shown on the left. Note how the green pair is not side-by-side as are all the other pairs. This configuration allows for longer wire runs.

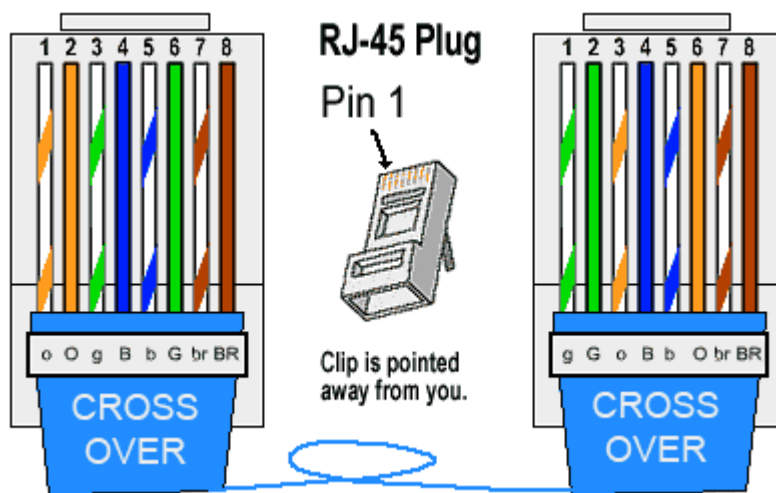


**Important Instruction:** Always remember that both end connector clip facing away from you when check the colour.

### **Crossover cables:**

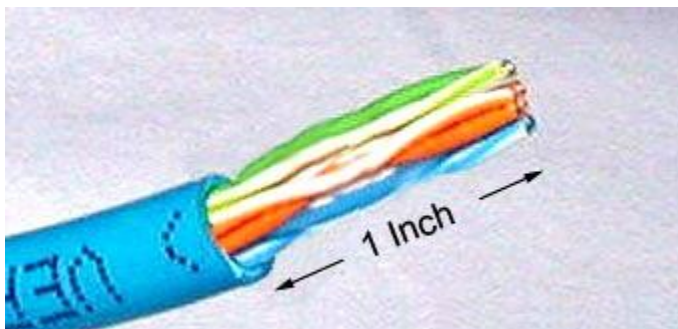
The purpose of a Crossover Ethernet cable is to directly connect one computer to another computer (or device) without going through a router, switch or hub.



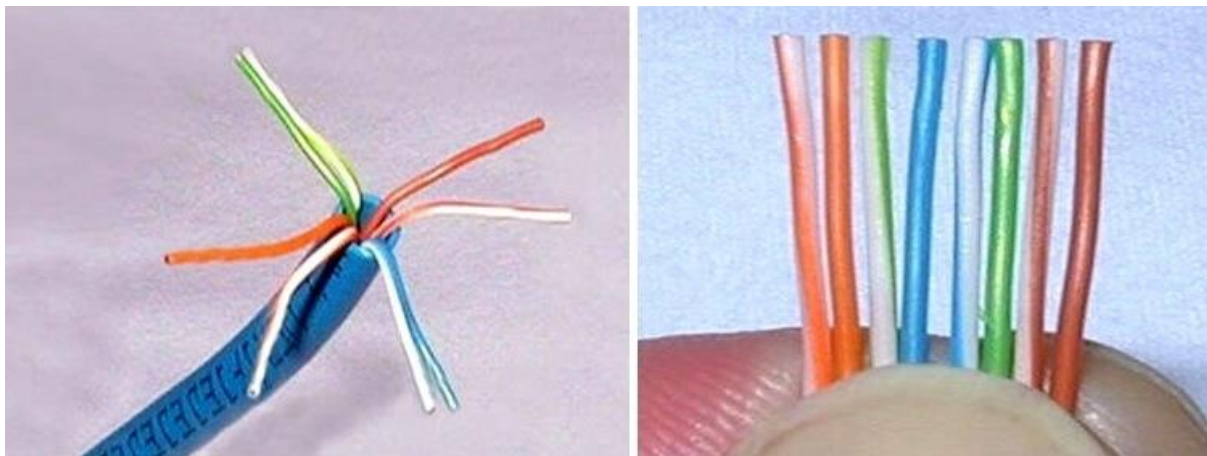


### Procedure to make RJ45 cable :

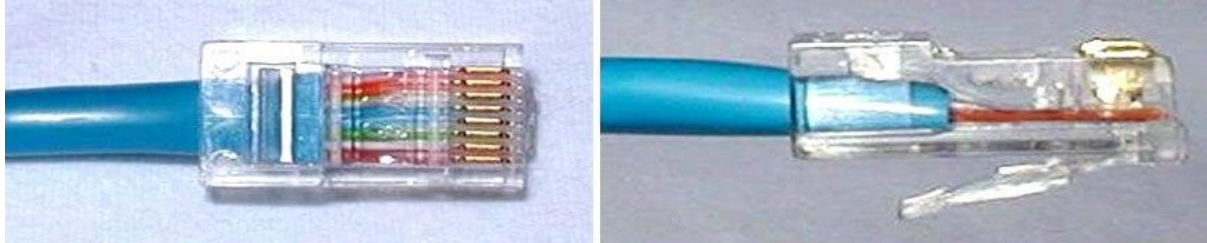
**Step 1:** Cut into the plastic sheath about **1 inch** (2.5 cm) from the end of the cut cable. Do not cut deep which may cause damage the insulation of core.



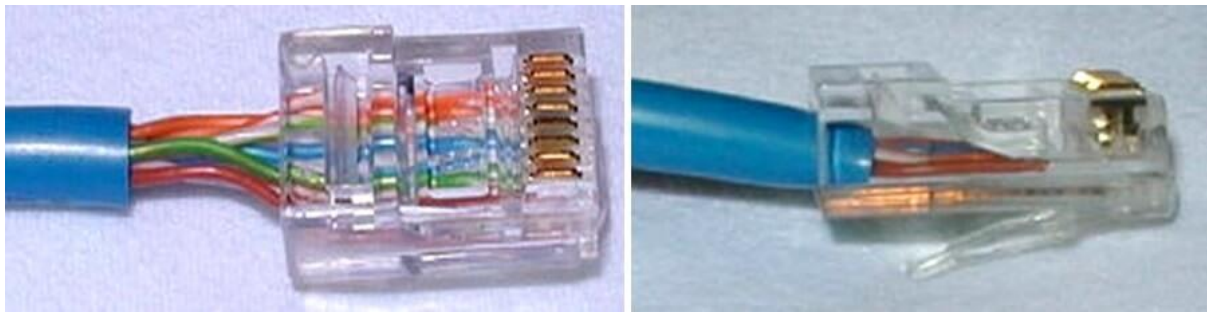
**Step 2:** Unwind and pair the similar colours. Pinch the wires between your fingers and straighten them out in a sequence of colour as u want to make cable (Straight cable or cross over cable). The colour order is important to get correct



**Step 3:** A straight cut across the 8 wires to shorten them to **1/2 inch** (1.3 cm) from the cut sleeve to the end of the wires by crimping tool. Carefully push all 8 unstrapped coloured wires into the connector. Plastic sleeve should be inserted proper in connector.



**Wrong way:** The plastic sleeve is not inside the connector where it can be locked into place. The wires are too long. The wires should extend only 1/2 inch from the blue cut sleeve. The wires do not go all the way to the end of the connector. The wires are too short.



**Crimping the cable:** Carefully place the connector into the Ethernet Crimper and cinch down on the handles tightly. The copper splicing tabs on the connector will pierce into each of the eight wires. There is also a locking tab that holds the plastic sleeve in place for a tight compression fit. When you remove the cable from the crimper, that end is ready to use.



**Test the cable:** Check the continuity of both connectors each other. Check the cable threw a cable tester or ping from a computer. To check the cable through computer connects both connector in two computers for cross cable and straight cable connect through a switch then ping the computer.