# Install safe home network

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**In this article, we will go into the details of the process of forming, installing and securing a local wired and Wi-Fi network. We will test in a space of about 56m $^2$ with 4 to 8 users, two rows of tables in front and two rows of tables behind the office.**

We will call the experimental small business Ergo, assuming an industrial design consulting firm. The goal here is to create a multi-Ethernet network with Wi-Fi access at any point in the specified space. Note that these guidelines and guidelines are not dependent on the physical space (size, shape) of the business. There are only a few variations in cable length and wired LAN port.

***Final note*** : *You should install a network cable underneath a dry wall or ceiling (for wired networks), the office looks brighter. You also need to buy Ethernet wall sockets for easier access* .

Now let's start with the steps.

**Step 1: Determine the essentials for the network**

This is a very important step, in which you will sketch the idea, the work to do before proceeding to purchase devices and parts according to the list. As noted above, you need to consider the following factors:

**a.** How many wired Ethernet ports should be used?
**b.** Where are Ethernet ports located? (In other words, where do the PCs and devices plug into the Ethernet port?).
**c.** Location for routers and high-speed modems?

Responding to these questions will help you understand the type of device to use, as well as how much cable is enough.

**Step 2: Determine where the device is located**

Before carrying out any installation, you need to determine the location for each device in the network. The correct decision to see if running a coarse CAT-5 cable underneath a dry wall or ceiling is important, because you cannot change the cable length if it is wrong.

For offices with medium physical space like our 'Ergo design consulting firm', it would be helpful to outline each location for nodes on the network specifically. Here is the physical location for Ergo's other ports and devices:

1. Cable modems and wired (wireless) routers are behind the office.
2. Two 2-port Ethernet wall sockets downstairs: one at the back of the office and one on the front.

**Step 3: Set of tools and supplies**

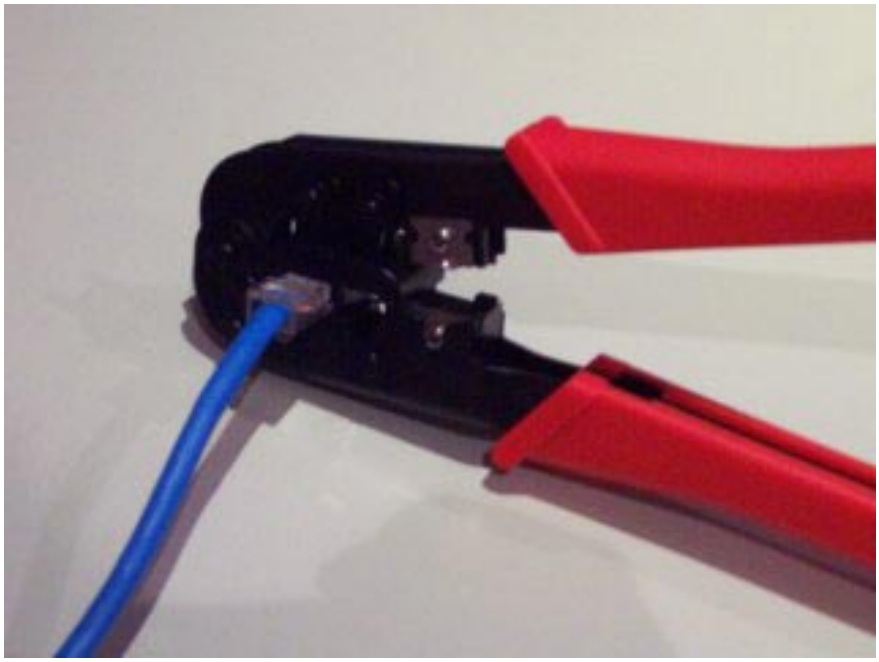
Here is a brief list of devices you will need:

**CAT5 Ethernet cable** : if done for 30m space, you will lose about 100 USD. CAT-5 cables look like phone wires, but thinner. If the LAN setup runs short distances to the nodes (computers, printers, etc.), you don't need to use a 'raw' cable, but just buy an uncompressed Ethernet cable. Or you can buy a kit that has all the necessary components at some computer stores.

CAT 5 cable connectors: You will need some flexible cable connectors, they are not very expensive so you can buy a little extra room in case of errors.


Cat5 cable connector

**Crimper** : To cut, remove, close Cat 5 cable with cable connectors, you need to use bending pliers). It costs between $ 20 and $ 40.



To cut, remove, close a CAT 5 cable with a cable connector, you need to use a pliers.

**Cable / DSL modem** : This device controls the traffic between your ISP and your network service provider. We will hook up the bandwidth router to the switch to distribute high-bandwidth Internet access to everyone in the office.

**Wireless / Wi-Fi router** : Known as a wireless access point, most wireless routers have 4 Ethernet ports for plugging in the back. If you use an 802.11n router, you should follow the next-gen Wi-Fi network standard, the speed of wireless in-network wireless transfer is fast. But around the end of the year, this standard was officially applied.

Don't buy 802.11b routers. They are old and slow. To increase business credit with wireless (Wi-Fi) and mobile computers, you should buy a router as quickly as possible. At that point, you will be able to expand the internal network bandwidth if the wireless usage requirement increases.

Routers are often used in small offices such as the home network range of 802.11g. It is fast enough for all operations, except for sending large files between multiple machines.

A high-speed and speed range router is Netgear's WPNT834 RangeMax 240.

If you're new to wireless networking, take a look at some of the articles to gain a deeper understanding of how to expand the range to some public places like cafes, airports, and hotels.

**Ethernet Hub** : This device is not mandatory. But if you need more than 4 Ethernet ports, the hub will allow connecting more computers to the network. Hubs usually have 4, 8, 16 or 24 ports. This is a basic device, so you can be assured with major network equipment manufacturers such as Linksys, D-Link System, 3Comp Corp, Netgear .

**Pegs** : The pins will allow you to fasten the CAT 5 cable to the wall.

**Installation process begins**

***Note*** : *If you are not interested in cable running, you simply want to know how to connect your router to a variety of wireless or wired computers, or want to know about network security, see step 6 .*

**Step 4: Take the cable**

In this step, we'll create the running cables used to establish a wired connection between the Ethernet port on the floor and the router and cable modem downstairs.

Take the CAT-5 cable from the router location and cable / DSL modem to the Ethernet ports. During travel, temporarily tag the cable to a wall or floor so you can visualize the actual cable to use. When finished, leave a segment (about 1 to 3m) at the end of the cable.

**Step 5: Crimp the cable**

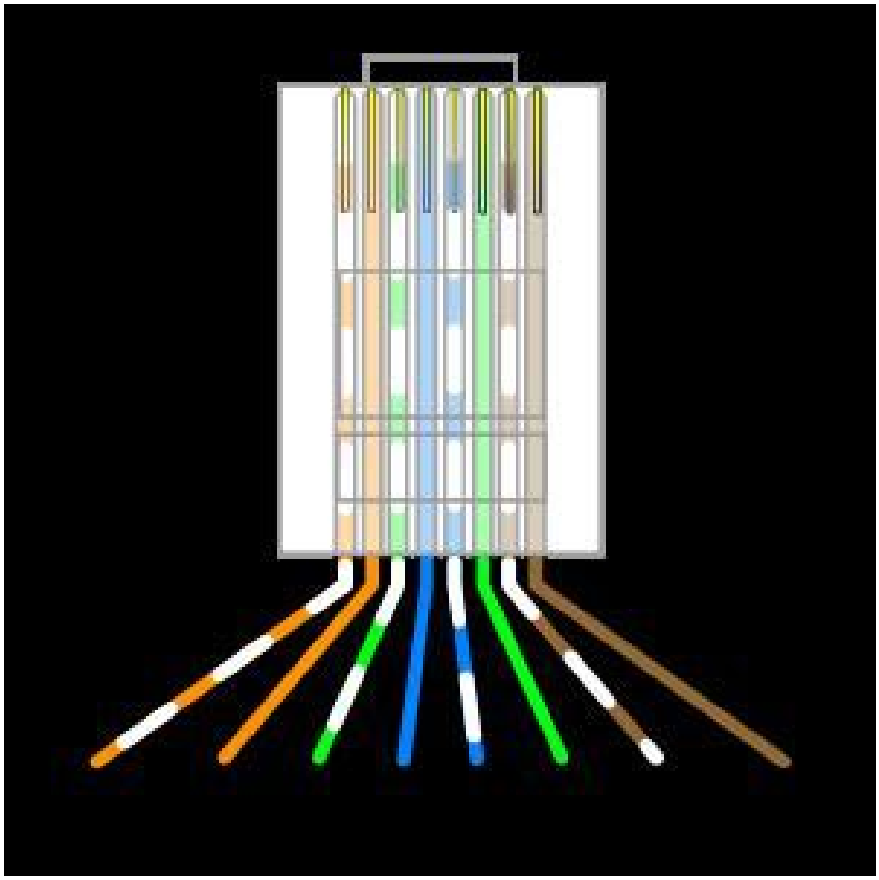
You may find it hard to believe, but this is actually the most difficult step in the whole process. Cable crimping is not easy, although it looks quite simple.

The CAT-5 cable is also bent in the form of telephone cable (RJ-45), as follows:

**1.** Cut out about 2.5 cm of the outer shell at the end of the cable, you will see 4 pairs of wires.

**2.** Straighten each strand.

**3.** Put the wires in the order as shown in the diagram below. After finishing, the group of strings approached to touch each other.



Arrange the cables in order (from left: orange-white, orange, blue-white, dark blue, dark blue-white, green, banana, brown-brown, brown).

**4.** Check the string order for accuracy.

**5.** Fasten the strings together, cut off a short piece at the end of the ends for equal. Remember to cut straight, so that 6 wires can be inserted into the connector, they will create direct communication.

**6.** Now, insert 6 tightly held ends to the connector, press tightly so that all 6 ends of the wire are in contact with the end of the connector and aligned.

**7.** Put the connector on the pliers, squeeze it hard.

**8.** If any string is not tightened, use electrical tape to reassemble it.

Repeat the above steps for each end of the CAT-5 cable.

**Network connection and security**

**Step 6: Connect all cables together**

In this step you need to connect all the cables in the network seamlessly. Note to disconnect all power cables before proceeding and do not confuse the DSL modem or router with PC computers.

**1.** Connect the cable / DSL output to a cable / DSL modem.

**2.** Connect the cable / DSL modem to the back of the router. The appropriate port for this connection should be 'cable modem' or 'DSL modem'.

**3.** Connecting all computers will use the Ethernet port wired to the router, via Ethernet cable.

*Note* : You can plug in any of the 4 network ports as you like. No need to plug in the computer in any order.

**4.** If using the Network Hub (or network switch), connect it to the router via an Ethernet cable (optional).

**5.** Now connect the source, first to the modem, then the router. Wait until the source on the modem is stable to switch to the router.

**6.** Finally, turn on a PC connected to the router to check again.

**Step 7: Check the network connection**

If all is successful, when you start your computer, your system will automatically connect to the Internet. If this is your first time using a computer with a cable modem / DSL, you may have to install and run some installation software to allow Internet access.

You should look throughout the office to make sure that the CAT-5 cables are correctly bent and are working properly.

**Step 8: Set up the router**

If everything goes well, the router will work immediately with any computer using an Ethernet cable connected to it. However, you should use software that provides initialization of wireless functions for the router.

**Step 9: Network security**

This is the most important step in all. Performing the tasks below will contribute to ensuring the network's safety to the maximum extent. To adjust router settings, you must access the router via a Web browser. Please check yourself with the correct URL.

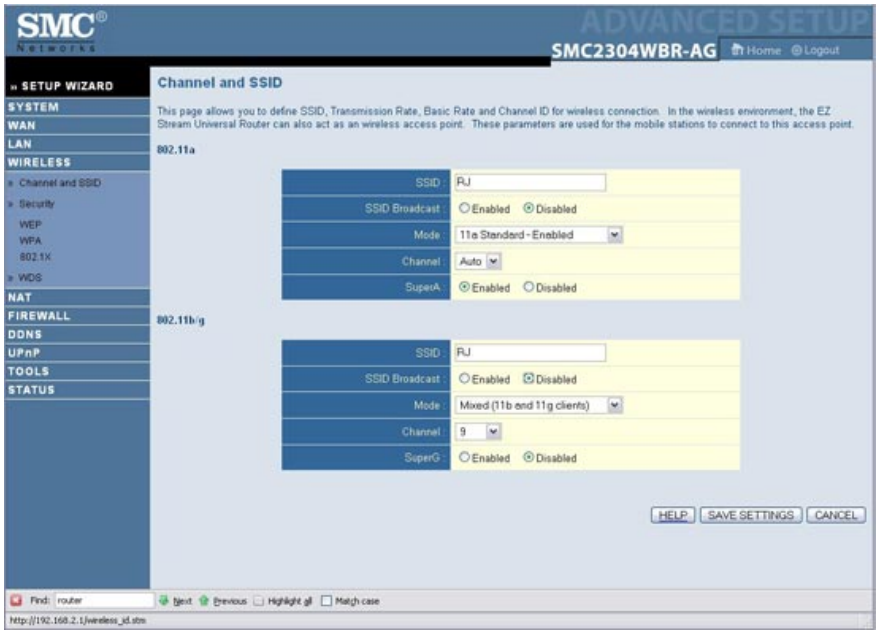
Usually, the security settings you should do are:

**1.** Change SSID parameters for the router. Use of names is not noticeable and unrelated to the business.

**2.** Disconnect the "SSID Broadcast setting" setting for the wireless router. This option will prevent snoopers from reviewing or tracking Wi-Fi networks via conventional means.

**3.** Set up Windows 128-bit WEP or WPA encryption mechanism. This process is quite easy, depending on the router's software.

**4.** Set the mode to use the firewall on the wireless router.




Setting properties is the last step, and perhaps the most important step in the process

One final step you should take to prevent random access in the network via wired or wireless systems is to change the working group name for all computers in your small business. To do this, go to **Control Panel** > **System Properties** > **Computer Name** . Press the ' **Change** ' button and type in the new workgroup name. All computers on the network in the company with this working group name can contact each other.

Congratulations! Now, you have a network for yourself!

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