

## **How to Set Up a Low-EMF Internet Connection**

Many people now realize that using Wi-Fi is not wise – both for security and health reasons. Wired Ethernet-based internet access goes a long way toward solving these issues. However, even a wired internet system can cause health effects if setup incorrectly. This is because of the electromagnetic interference (EMI) that many new modems and routers create. This EMI travels along your Ethernet cable to your computer and can become just as problematic as Wi-Fi from a health perspective.

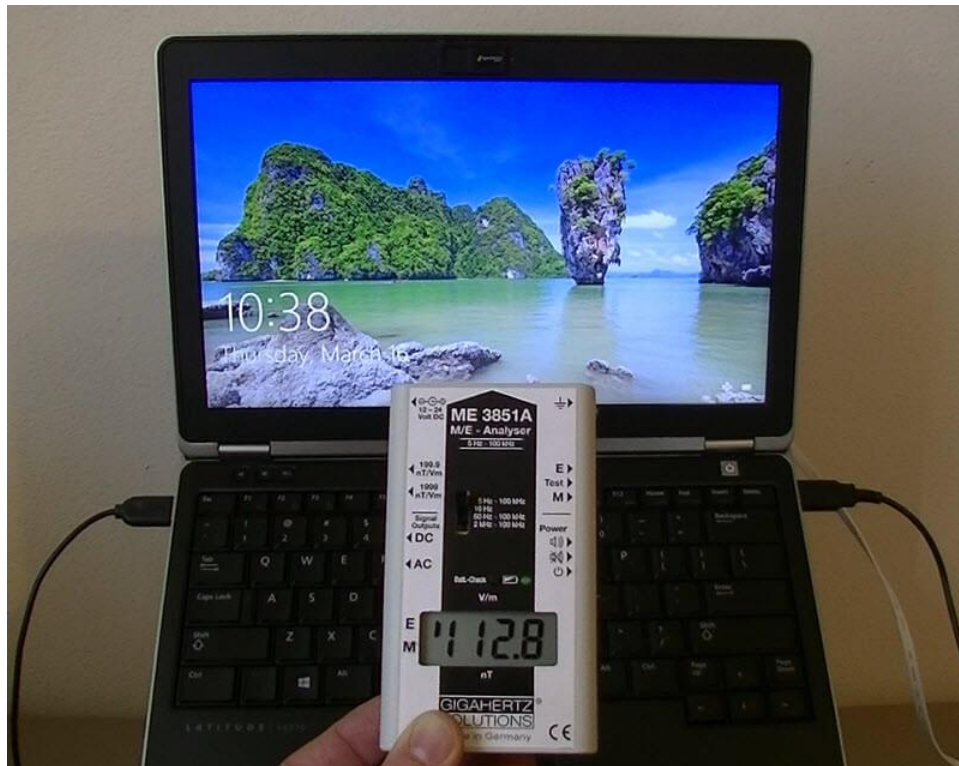
In this article, you will learn how to install a wired internet system that produces very little EMI. For electrically sensitive individuals, this will allow you to use your computer for longer periods of time without symptoms. For health-conscious people, this is the next step in creating a truly low-EMF home for you and your family.

Before we move on to recommended solutions, I want to explain the primary reasons why EMI is created by a wired internet system:

1. Modems and routers all have a switched-mode power supply (SMPS) that is plugged into an outlet. The EMI created by this SMPS can travel along your electrical wiring and Ethernet cables. You can test this with an AM radio and electric field meter (pictured below).
2. Newer “Gigabit” modems and routers that allow for “blazing fast internet speeds” of 500 or 1,000 mbps create excess high frequency EMI that travels along your Ethernet cable to your computer. Here is a [technical explanation](#) as to why this happens. Whenever possible, I suggest you use lower bandwidth equipment rated at 10/100 mbps. This is still fast enough to stream movies on Netflix or YouTube.
3. In some offices and homes, companies will install Power Over Ethernet (PoE). This allows a small amount of electricity to flow through the Ethernet cables, typically to power a phone/modem system in separate rooms. Unfortunately, PoE cables are not shielded for the high amounts of EMI they carry and these systems are very unhealthy for users.
4. Rather than using Wi-Fi or long, shielded Ethernet cables, some people use PLC (power-line communication) systems to transmit internet data around the home on the electrical wiring system. Unfortunately, these PLC systems create an incredibly high amount of EMI (“dirty electricity”) on your home wiring. This EMI then radiates into your living environment and is transmitted to your computer.

### **What Does EMI Look Like?**

In the following images, you can see both high and low EMI readings for a wired laptop. The laptop is running on battery power and utilizes an external keyboard and mouse. The first picture shows very high electric field readings with a typical wired internet system. The second image shows healthy readings (ideally below 3 Volts/meter at your computer). Below the pictures, I explain exactly how to achieve these low EMI readings.



Electric field readings of over 100 V/m are highly problematic. Some people feel drained or experience headaches from sitting at their computer and this EMI issue can be the primary cause. Levels this high greatly reduce the amount of time I can spend on a computer without symptoms.



This electric field measurement was taken just a couple minutes later once the proper setup was in place. The only difference is there is now almost no EMI transmitted by the Ethernet cable. Electric field readings below 3 V/m are much healthier for any extended use of your computer.

## How to Set Up a Low-EMF Internet Connection

I have experimented with a lot of computer equipment over the years to find brands and models that allow me to work with fewer symptoms. The following is a home internet system that creates low EMI, measured with both an electric field meter and AM radio.

1. If your cable internet provider is any company except AT&T or Verizon, I suggest you get this [Arris/Motorola Modem](#). It is the lowest bandwidth modem I have found at 172 mbps. This is still much more bandwidth than you can likely purchase from your internet provider. The modem is compatible with Comcast and transmits minimal low-frequency EMI from its SMPS. *Update March 2019:* Several readers have noted that the Arris modem noted above is no longer compatible with Comcast. Instead, I recommend the [Arris Surfboard SB6141](#) or the [Arris model TM822G](#), which you can rent from Comcast or buy online. You will also need a wired router, such as this inexpensive one from [TRENDnet](#) or this [Netgear router](#) that has an on/off button for WiFi. A router is needed because Comcast and most internet providers do not automatically provide multiple IP addresses.
2. For your router, I would stay away from high-bandwidth devices (1 gigabit and above), such as [Netgear routers](#) (unless you occasionally need some wireless capability in your home). When I test these routers, they create an incredible amount of low and high frequency EMI on the Ethernet cables. This will be true for most “Gigabit” routers. Instead, I suggest that you use a simple, low-bandwidth Ethernet switch, such as [this 4-port model from TP-Link](#). Here is an [8-port model](#) if you have many devices. Alternatively, you can use this [wired TRENDnet router](#), which is especially handy if your modem does not split the IP addresses for you. Both are rated at 10/100 mbps, which is now considered slow. However, this is a good thing from an EMF health perspective! 100 mbps is also more bandwidth than your Internet Service Provider is likely bringing to your home. Both the TP-Link switch and the wired TRENDnet router created very little EMI in my tests.
3. You will then need to purchase two Ethernet cables to connect to your laptop. The reason for purchasing two cables can be seen in the next step. I recommend these thin, [shielded Cat-7 cables](#). Two 25-foot cables are ideal, but you can get shorter or longer cables based on your needs. You will also need a [short cable](#) to place between your modem and the Ethernet switch.
4. The final step to have a low-EMF internet connection is to utilize an [Ethernet ground adapter](#). This ground adapter will be placed in between your two Ethernet cables and will ground most of the lower-frequency EMI (below 1 MHz) so that it is not being transmitted to your computer. You will run the first Ethernet cable from your switch to the ground adapter. Then you will run your second cable from the ground adapter to your computer. Here is a picture showing what the ground adapter looks like. Note that [LessEMF](#) now also has their own [Ethernet ground adapter](#). I have used this as well with good results.



An [Ethernet Ground Adapter](#) will reduce much of the EMI flowing to your computer.

<https://www.youtube.com/watch?v=ULV0jKXcnJo>

[The above video will show you some of the steps I take to reduce the EMI at my computer.]

<https://www.youtube.com/watch?v=oUdEYBIVz1Q>

[This new video (2018) shows you the specific items that will allow you to ground your Ethernet connection if you do not have access to an electrical ground in your home. You will need two [shielded CAT-7 or CAT-6](#) cables, a [ground adapter](#), a [gator-to-gator clip](#), a [50' extension cable](#) and a thin 2' copper stake that you can buy for about \$2 at your local hardware store or from [LessEMF](#). The total cost for this setup is approximately \$75. If you create your own system, just make sure you have metal-to-metal all the way to the ground outside and that the electric fields at your computer are below 2 V/m.]

Whether you are electrically sensitive or you simply want to have a healthier home for your family, the above solution will make quite a difference. Many people are now aware that Wi-Fi is dangerous. However, microwave radiation from wireless technology is only one part of the EMF equation. Electromagnetic interference can be just as problematic and could be the reason why you experience symptoms from computer use. Hopefully this article will help you have a truly healthy, low-EMF internet connection for many years to come.

**Note:** If you would like to obtain an EMF meter to check the electric fields at your computer, I suggest either the [Gigahertz Solutions ME3830B](#) or [ME3851A](#) (pictured above). I discuss [on this page](#) how to order and get a 10% discount on these EMF meters. I also suggest the Radio Shack AM Radio Model 12-467 that can be found on ebay. You can always [contact me](#) to discuss how to do this.

This article was updated March 2019.