# How to measure ground currents


**We show how to measure ground currents, which may help determine whether there is a need to mitigate them.**

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Ground currents are electrical currents than run in the soil instead of on wires. The current generates a magnetic field that can be bothersome to very sensitive people, who may have difficulty sleeping at night, and other neurological symptoms.

## The instrument

The ground currents generate a magnetic field that rises from the soil. This can be measured by a gaussmeter.

You will need a pretty good meter, that is sensitive enough so it can display 0.1 milligauss (10 nanotesla, nT). This is sometimes referred to as the meter's "resolution."

Even better is one that can display 0.01 milligauss (1 nT).

Most gaussmeters are not sensitive enough. Look for meters from Gigahertz Solutions and AlphaLabs.

The meter shown on the above picture is a model 3030B, which can detect 1 nanotesla (0.01 milligauss). It shows zero since it is pictured in an area far from any electricity.

## Keep it steady

A sensitive gaussmeter must be held completely steady when you make a measurement. Any shaking or movement of the hand will give a false high reading. This is because the meter is moved in the Earth's magnetic field.

To demonstrate this effect, try to hold a weak magnet, such as a refrigerator magnet, close to the meter. If you move the magnet, it will make the meter react. If you hold the magnet still, it won't.

To measure low levels of ground currents, you may have to place the meter on the ground, a table, a chair or such, to hold the meter completely steady.

## One-axis meters

Most gaussmeters are three-axis meters. That means the meter has three sensors, one for each dimension (including up-down). Such a meter works no matter how you orient it.

If you have a one-axis meter, or a meter set for one-axis measuring, you will need to measure on the vertical (up-down) axis. All ground currents radiate vertically only. A one-axis meter can make you more confident that what you measure really does come from the soil and not from something else.

For one-axis measurements, it will show the same whether you hold the sensor pointing up or down.

## Measuring ambient ground currents

Walk around outside your home with the gaussmeter. Note the readings when you are at least 30 feet (10 meters) from any building, transformer, electrical pole, etc. (Be aware that power cables can be buried.)

Remember, you need to hold the meter absolutely still, or place it on the ground.

If you are in suburbia, the readings should be between 0.1 and 0.5 milligauss (10 to 50 nanotesla).

In a densely built city, the readings will be a little higher. In a rural area, the readings should be between 0.001 and 0.1 milligauss (0.1 to 10 nanotesla).

If you get higher readings than these numbers, you are probably picking up something else too, that is much stronger. Try to identify what it is. It could be a buried cable or a metal pipe (gas, water, district heating).

If the instrument shows zero, it just means the ground currents are below what the instrument can detect. Unless you are standing several miles (kilometers) from the nearest electrical service, the ground currents won't be zero.

Ground currents do not fluctuate, so the reading should be a steady number. If it fluctuates, it is picking up something else, or the meter is not held steady enough.

Do a set of readings at different times, especially on evenings (neighbors are home), on hot days (airconditioners are on), and after a lot of rain (the ground is soaked). You may notice the ambient ground currents change between these times.

You should now have a good idea what the ambient levels are in your area. This is the best you can hope for when trying to mitigate ground currents in your house.

## Measuring ground currents around your house – step 1

Turn off all breakers in the house, and for anything else you can, such as a garage, well, and solar system.

Walk around the outside of the house, near the wall. It can be helpful to draw the outline of the house on a sheet of paper, and note your readings.

Locate the house ground rod if you can. It may be located where the electricity enters the house. Some houses have the ground rod under the basement floor where you can't see it.

If you can, place the meter directly on the ground wire going down to the ground rod. Then move the meter three feet (one meter) away. If the reading is higher near the wire, that indicates a current is running into the soil. (You can still have ground currents coming from other ground rods, even if this one doesn't carry a current.)

If you can't get to the ground rod wire, but still get near the ground rod, try to measure around it. Place the meter as close as you can to the ground rod, and then also measure a little further away (a few feet/meters). If the reading goes down as you move away from the ground rod, that indicates you have ground currents coming from it.

Again, remember the meter must be held absolutely still to make accurate readings. You may have to place the meter on the ground.

## Measuring ground currents around your house – step 2

Turn all the breakers back on.

Then repeat the measurements while walking around the outside of the house. Write the numbers down on the sheet in a way so you can tell them from the first set of numbers.

Try to turn something on inside the house that consumes a lot of electricity, such as an electric stove, electric heater or airconditioner. See if that increases your readings (it should go up at the breaker box, which is normal and doesn't show a ground current).

## Interpreting your measurements

You may notice your readings were a little higher in one part of the house. This indicates a narrow ground current. Try to follow that current away from the house to its source, such as a power pole, a transformer or another house.

You may find the only area with elevated readings is around the ground rod. That means the ground rod is creating a ground current (unless you are just picking up the current on the other wires, when the breakers are on).

If the readings are the same on all sides of the house, and near the ambient levels you've measured, then the house electrical system is not causing trouble. Whatever ground currents you have are coming from somewhere else.

Be aware that there can be other sources of magnetic fields. You may need to hire someone with experience doing these measurements.

## Other methods of measurement

Several people have tried to measure the ground currents directly. That involves inserting two ground rods in the soil some distance from each other and then measuring the voltage between them with a sensitive voltmeter (that can measure millivolts).

Then one (or both rods) must be pulled out and moved so the rods are turned ninety degrees, for another measurement along that axis.

This method doesn't seem to work well. The current does not distribute itself uniformly in the soil, so moving the rods just a little bit can give very different readings. It is also unknown how the current distributes itself vertically, i.e. if there a need for measuring at a certain depth (which may depend on the type of soil and the different layers, and moisture).

Doing measurements with gaussmeters seem to be much more reliable and reproducible.

## Human tests

Tests where humans report how they feel in different places are notoriously inaccurate. There can be other factors causing the symptoms, such as radio waves, air pollution, mold, pollen, food, etc.

People who are highly sensitive sometimes feel sick without even knowing why, as there are simply so many possibilities, and many can have a delayed effect.

It is also well documented that the vast majority of people are subject to the nocebo effect. They feel sick because they expect to feel sick. This happens to all sorts of people, healthy or sickly, young or old, etc.

This effect causes a lot of trouble when the pharmaceutical companies test the safety of new drugs. They have to test on several people, with some given an inert placebo. Then they compare the symptoms "caused" by the placebo with the symptoms caused by the drug to see what side-effects that drug actually has. These tests are always done with people who are young and healthy.

If you do try this method, make sure to bring instruments to measure other kinds of EMF, and look around the neighborhood for possible problem sources. Spend

enough time at the site to rule out exposures happening en route. If possible, an overnight stay is preferable.

## More information

More articles on how to measure EMF:
www.eiwellspring.org/measureemfmenu.html.

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