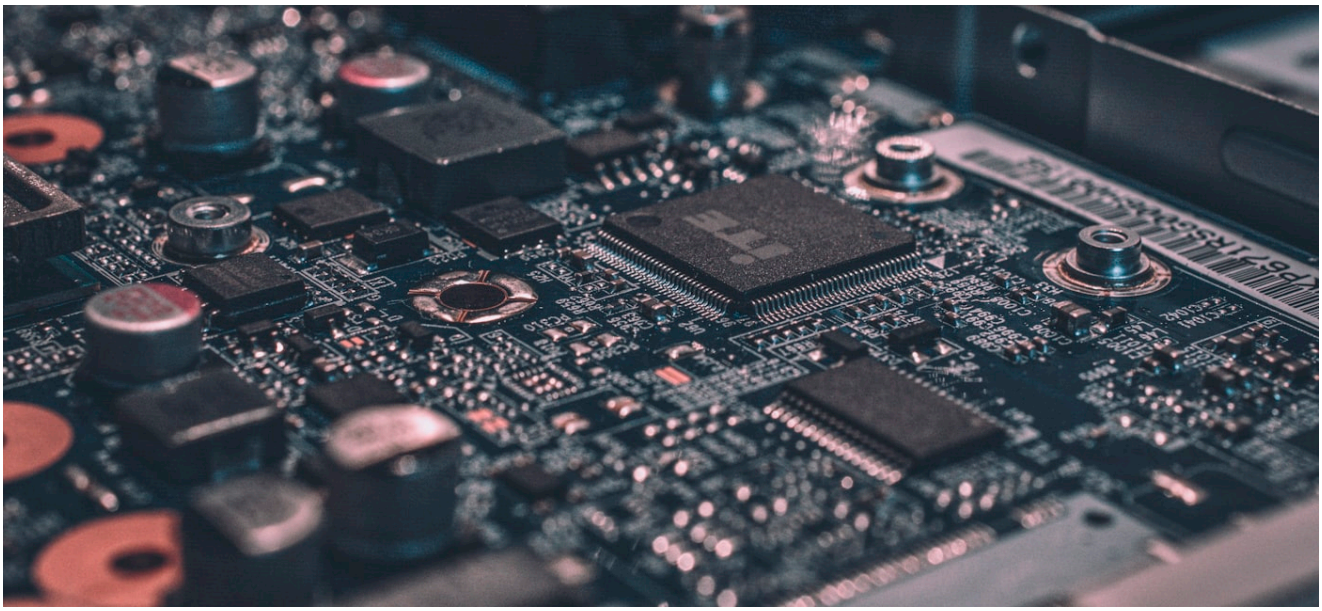
What Does µT Mean on a Compass App? Magnetic Field Strength Explained

What does µT mean on a compass app? Learn how microtesla readings reveal magnetic interference, what normal vs abnormal values look like, and when to trust or distrust your compass heading.

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You open your compass app and notice a small number in the corner: **48 µT**. What does that mean? Is it good? Is it bad? Should you care? The short answer is: **yes, you should care** — because that number tells you whether your compass heading is trustworthy or completely wrong.

What Is a Magnetic Field?

The Earth generates a magnetic field created by the movement of molten iron in its outer core. This field extends from the planet's interior out into space, and it is what makes compasses work. The field has both a **direction** (which your compass uses to find north) and a **strength** (which is measured in microtesla).

Think of it like wind: wind has a direction (from the west) and a speed (20 km/h). A magnetic field has a direction (toward magnetic north) and a strength (measured in µT). Your compass reads the direction. The µT meter reads the strength.

What Does µT Stand For?

µT stands for **microtesla** — one millionth of a tesla. The tesla (T) is the SI unit of magnetic flux density, named after physicist Nikola Tesla. Since the Earth's magnetic field is relatively weak compared to, say, an MRI machine, we measure it in microtesla rather than full teslas.

- **Earth's magnetic field:** 25–65 µT (depending on location)
- **Refrigerator magnet:** ~5,000 µT (5 mT)
- **MRI machine:** 1,500,000–3,000,000 µT (1.5–3 T)
- **Neodymium magnet:** up to 1,400,000 µT (1.4 T)

Your phone's magnetometer is designed to detect the very weak field of the Earth. When something stronger enters the picture, it overwhelms the sensor.

Normal vs Abnormal Readings

µT Range	Interpretation	Compass Reliability
25–65 µT	Normal Earth magnetic field	Reliable — trust the heading
65–100 µT	Mild interference present	Usable but verify with landmarks
100–200 µT	Significant interference	Unreliable — move to a cleaner location
200+ µT	Strong magnetic source nearby	Do not trust the compass at all

The Earth's field varies naturally by location. Near the equator, it is weaker (around 25–40 µT). Near the poles, it is stronger (50–65 µT). But it stays within that 25–65 µT band everywhere on the planet's surface. Anything significantly above that range means **something other than the Earth is affecting your sensor**.

What Causes High µT Readings?

When your compass app shows an abnormally high µT value, something nearby is generating or distorting the magnetic field. Common culprits:

Permanent Magnets

- **Phone case magnets** — MagSafe cases, magnetic flaps, and car mount plates contain magnets right next to your magnetometer. This is the single most common cause of compass inaccuracy.
- **Laptop speakers** — contain neodymium magnets that produce a strong localized field.
- **Handbag/backpack clasps** — magnetic clasps can reach 500+ µT at close range.

Electronic Devices

- **Laptops and tablets** — besides speakers, the battery and power circuits create magnetic fields.
- **Other phones** — a second phone right next to yours will affect the reading.
- **Wireless chargers** — use electromagnetic coils that generate significant fields.

Metal and Infrastructure

- **Metal tables and desks** — ferromagnetic metals (iron, steel, nickel) distort the local field even if they are not magnetized.
- **Steel-frame buildings** — the rebar in concrete walls and floors can affect readings

indoors.

- **Vehicles** — cars, buses, and trains are metal boxes filled with magnets and electronics. Compass readings inside vehicles are almost always distorted.
- **Railings, pipes, and metal structures** — bridge railings, metal fences, underground pipes.

Practical Examples: µT in the Real World

To illustrate how dramatically your environment affects the reading, consider these scenarios:

Phone on a Wooden Table

You place your phone on a wooden table in the middle of a room, away from electronics. The µT reading shows **47 µT**. The compass points steadily north. This is a clean reading — you can trust it.

Phone on a Metal Desk

Same phone, placed on a steel office desk. The µT reading jumps to **120 µT**. The compass heading shifts by 30 degrees. The desk's ferromagnetic material is warping the local field. **The heading is wrong**, even though the compass looks like it is working normally.

Phone Next to a Laptop

You set your phone down 10 cm from your laptop's speaker grille. The µT reading spikes to **180 µT**. The compass swings wildly. At 50 cm away, it drops back to 60 µT. At 1 meter, it is back to normal.

Phone in a Car

Sitting in the driver's seat with your phone on the dashboard. The µT reads **95–150 µT** depending on the car. The compass may appear stable but is offset by 10–45 degrees from the true heading. Inside a car, never trust a phone compass for precise navigation.

Phone Outdoors, Open Field

Standing in a park or field, phone held at chest height, no metal nearby. The µT reads **49 µT**. The compass is accurate. This is the ideal condition for compass use.

How NorthPin Uses µT to Keep You Informed

NorthPin True North Compass does not hide the µT reading — it puts it front and center because it is essential information:

- **Real-time µT display** — the current magnetic field strength is always visible on screen. You do not need to open a separate menu or enable a setting.
- **Interference warning** — when the µT value exceeds the normal range, NorthPin shows a clear warning that the compass heading may be unreliable. This prevents you from trusting a bad reading.

- **Actionable information** — unlike most compass apps that silently show a wrong heading, NorthPin tells you *why* the heading might be off and implicitly tells you to move to a better location.

This is the difference between walking confidently in the wrong direction and knowing to reposition before you trust the arrow.

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When to Trust Your Compass Reading

- **µT is 25–65:** Trust it. You are reading the Earth's field cleanly.
- **µT is 65–100:** Probably fine for general direction, but verify with a landmark if precision matters.
- **µT is 100+:** Do not trust the heading. Move away from the interference source and check again.
- **The compass is spinning or jumping:** Strong interference or an uncalibrated sensor. Recalibrate (figure-eight motion) and move to a cleaner location.

Frequently Asked Questions

Why does my compass app not show µT?

Most basic compass apps do not display the magnetic field strength because they prioritize simplicity over accuracy. Unfortunately, this means you have no way to know whether the heading is reliable. Apps like NorthPin include the µT meter because it is critical information for anyone who actually depends on the compass.

Is a higher µT reading always bad?

For compass accuracy, yes — higher than the normal 25–65 µT range means interference is present and your heading may be off. The µT number itself is not dangerous to you (the Earth's magnetic field is harmless), but it tells you the compass reading is compromised.

Can I use the µT meter as a metal detector?

In a basic sense, yes. If you move your phone near a metal object and the µT value spikes, you have detected the magnetic distortion caused by the metal. Some compass apps (like Compass Steel 3D) include a dedicated metal detector mode that uses this principle.

Does the µT value change with weather?

No. Weather does not affect the Earth's magnetic field in any way you could detect with a phone. Temperature extremes can slightly affect the magnetometer hardware itself, but the µT reading is overwhelmingly determined by the magnetic environment, not atmospheric conditions.

The Bottom Line

The µT reading on a compass app tells you whether the magnetic field around your phone is clean (25–65 µT) or contaminated by interference (100+ µT). If you are not checking this number, you have no way to know whether your compass heading is right or wrong. **NorthPin True North Compass** makes this easy by showing the µT value in real time and warning you when interference is present — so you always know when to trust the arrow and when to move.

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