

What is GPS?

The Global Positioning System (GPS) is a navigation system using satellites, a receiver and algorithms to synchronize location, velocity and time data for air, sea and land travel.

The satellite system consists of a constellation of 24 satellites in six Earth-centered orbital planes, each with four satellites, orbiting at (20,000 km) above Earth and traveling at a speed of (14,000 km/h).

While we only need three satellites to produce a location on earth's surface, a fourth satellite is often used to validate the information from the other three. The fourth satellite also moves us into the third-dimension and allows us to calculate the altitude of a device.

GPS is the world's most utilized satellite navigation system.

Dilution of precision (DOP), or geometric dilution of precision (GDOP), is a term used in satellite navigation and geomatics engineering to specify the error propagation as a mathematical effect of navigation satellite geometry on positional measurement precision.

HDOP – horizontal dilution of precision

The effect of the DOP on the horizontal position value. The more good visible satellites low in the sky, the better the HDOP and the horizontal position (Latitude and Longitude) are.

DOP Value	Rating	Description
1	Ideal	Highest possible confidence level to be used for applications demanding the highest possible precision at all times.
1-2	Excellent	At this confidence level, positional measurements are considered accurate enough to meet all but the most sensitive applications.
2-5	Good	Represents a level that marks the minimum appropriate for making accurate decisions. Positional measurements could be used to make reliable in-route navigation suggestions to the user.
5-10	Moderate	Positional measurements could be used for calculations, but the fix quality could still be improved. A more open view of the sky is recommended.
10-20	Fair	Represents a low confidence level. Positional measurements should be discarded or used only to indicate a very rough estimate of the current location.
>20	Poor	At this level, measurements are inaccurate by as much as 300 meters with a 6-meter accurate device (50 DOP × 6 meters) and should be discarded.