



Frequently Asked Questions

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1 Introduction

This document is a reference document to help customers understand more about the technology and the complexities behind the solutions. It also explains usual issues observed and helps the customers use the platform effectively

2 FAQs

2.1 There is a gap in the data shown on the platform where at times the latest location of the vehicle is not shown accurately

This happens in 3 cases

- GPRS signal is not available do to which the tracker is not able to send data to the platform. Recommended approach is to call the tracker number so that it can send the location details
- The tracker is blocked by something made of metal which is prevent the signal from getting transmitted.
- Tracker not installed in the right position. Please contact Zaeem help desk asap.

2.2 There is no data showing in the platform for the vehicle why??

Check whether

- there is enough deposit in SIM card or not;
- SIM card has specific requirement on cell phone or not. For example whether the SIM card can only use in an appointed cell phone, other cell phone cannot use the SIM card
- SIM card is binding to the specific cell phone or not

- SIM card need some authorization when using it. For example, you need type one password when you use the kind of SIM cards
- Tracker has enough power to work, we strongly suggest it was charged at least 3 hours or connect to the external power before use it.
- SMS which is replied by tracker is including the chars --- "Last", It indicates the GPS signal is lost.

2.3 Sometimes the location of the tracker is not accurate as compared to the real position. Why is that??

This is observed due to what we call as a GPS static drift (Drift Inhibition)

GPS error:

There are many factors affecting GPS accuracy and the following is about a brief table of GPS errors:

- Satellite clock error: 0-1.5m
- Satellite track error: 1-5m
- Error of ionized layer introduction: 0-30m
- Error of atmospheric layer introduction: 0-30m
- Receiver noise: 0-10m
- Multipath reflection: 0-1m
- Overall positioning error: about 28m

The brief table above does not mean such error really exists but indicates the best and worst range. Neither all the errors happen at the same time under good circumstance, nor under bad circumstance. In satellite navigation message, the correction parameters of atmospheric layer have been included to eliminate 50%-70% errors. What is more, the error range of GPS produced in recent years is always 10m or within it. Under the current circumstance, it is impossible for civil single set of GPS receiver to reach the precision within 1m due to the map, surveying and mapping of positioning point and operation speed of embedded equipment besides GPS precision. It is insignificant for the civil products to seek for positioning precision excessively.

2.4 What is GPS drift?

People who ever used GPS may think like this: when GPS terminal is static, the positioning coordinate (longitude and latitude) always changes and even significantly sometimes. Speed may be displayed. Industry insiders call it as "drift". In fact, GPS drift generates not only under statically but also dynamically and the only difference is that drift degree is not that obvious and the generating rate is

very small. This is actually one characteristic of GPS. (It is not that difficult to interpret why drift happens to GPS by understanding GPS positioning principle but it is not described in detail here). The reason why GPS is so magic is that wherever you go, it knows your coordinate. However, it also makes you feel bad when using it. If you are a driver, to strength vehicle management, your leader has installed GPS monitoring equipment to limit that vehicles can drive within certain period in designated area and those who go against it will be punished. You may receive punishment notice one day: someday you went against the regulation. You may feel wronged. If so, please don't blame others but your "GPS". Your GPS drifted to another place, causing "driving beyond the designated region". GPS drift also causes many other problems such as the large mileage statistics deviation. Vehicle parks at the gate but it displays dozens of mileages or even several hundred mileages of driving. It can be concluded that many problems in GPS application are relevant to "drift". If such problem can not be well resolved, more and more users will misunderstand GPS or even doubt it, which restrains the promotion of GPS application to a certain extent.

GPS drift is one of the problems to be settled in GPS application and it mainly covers two aspects:

The first one is too fast speed, making the response time of GPS shorter than the current operation speed. If so, drift will occur then.

The second is that drift happens when GPS signal is folded or reflected for several times where tall buildings are dense or whether condition is not satisfactory, causing signal error.

Two reflections of GPS drift: static position drift and speed (position) drift

Static speed drift can be resolved and remains zero when it is unchanged. Position drift is normal and it is a matter of precision. The current civil ones are generally below 10m and may be 5m when the condition is good. In addition, the measuring type has a very high precision but higher if differencing technology is used but such product is very expensive and seldom used.

Two resolutions to GPS drift:

1. Main system is designed to reduce the interference to GPS signal within the short distance.
 2. Software processing. Software processing is centrally finished in navigation software which will position coordinate within the road. If the signal received by GPS is beyond the radius of road, it will filter the data automatically and calculate the position of the current points according to the speed and direction previously.
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Several common drifts in GPS positioning and the causes:

1. Superposition drift

Superposition drift usually happens in 2D positioning and continuous drift will happen to the positioning point along certain direction. The distance of each point may not be very far with certain speed. When drifting comes to certain distance, it will come back to the original point slowly and continuously. Under the circumstance of 2D, the drifting scope will be larger than that of 3D. The main reason for it is the drift caused by the calculation of internal GPS software, weak signal positioning of module in the long run, 2D positioning or equipment interference.

2. Drift of positioning point:

The drift of positioning point means that the drifting distance between two points surpasses 100m or the threshold distance set by chip software. No speed data exists in data. It will come back to the original point with the same drift distance in certain period. Such circumstances mostly happen in Ephemeris transformation when module is interfered suddenly. It is most obvious that it will occur during the sudden change of 2D and 3D positioning. Such drift has no direction or rules and difficult to be dealt with.

3. Drift of positioning precision:

The drift of positioning precision mostly happens in motion process with drifting from one point suddenly but coming back very quickly. Such point may have certain speed but without speed data in other period. Such phenomenon is caused by signal refraction. Under normal positioning, one strong refraction signal participates in position suddenly, causing positioning precision drift in motion process. As long as the fraction signal gets lost, normal positioning precision will be recovered.

The following software judgments are recommended for GPS static drift:

1. The forced speed is 0 when status is inspected static;
2. The forced direction is 0 when speed is 0;
3. Both longitude and latitude on map will not be upgraded if the speed in data is 0;
4. Whether slow movement exists is judged by comparing the absolute value (including the time) of longitude and latitude difference of positioning data in last time;
5. As for vehicle terminal, only auxiliary means can be used to resolve GPS static

drift. For instance, the method of inspecting ACC key power is used to inspect whether it is static drift or not for vehicle can never be moved when the key power is closed. In addition, some GPS modules can be set as static mode, walking mode, auto mode, marine mode or flight mode to resolve drift.

6. PDOP value (positioning precision factor) is judged to decide whether the current positioning longitude and latitude data needs transmitting. When the current PDOP value ≥ 3.0 , position precision will be inferior and such longitude and altitude data is not recommended but obtained in GPGSA sentence.
 7. 2D data positioning is relatively inferior and superposition drift easily happens. It is thus not recommended for data uploading but obtained in GPGSA.
 8. Electric fence way is used for positioning equipment with continuous judgment for 4-5 times. If such point is judged continuously for 4-5 times that it is set beyond the fence, it will be determined to be under movement status and will be incorporated beyond electric fence. If such point is beyond electric fence once or twice, it can be judged that such point is the drifted point. Data screening is thus required to remove the data of such point
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