# 1 FAQ

1. Is the system open source?

   The system is completely open sourced, including embedded code, upper computer code, algorithm and etc. Besides, it provides related development manuals and video tutorials, which helps the user to begin secondary development easily.
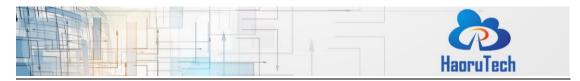
2. Is the system mature? Does it need redeveloping before use?

   The system is already mature, it provides complete positioning function, which means the user can get positioning data through ports directly. Also, users can redevelop the system to meet their own needs through editing source code.

3. How many modules do I need?

   It depends. Here are some examples:

1) If you need to range from one to one, it needs two.

2) If you need to set up 2D position, it needs 4, which includes 3 anchors and 1 tag.

3) If you need to set up 3D position, it needs 5 at least, which includes 4 anchors and 1 tag.

4) If you already had modules in hand and want to increase the number of anchors or tags, you need to buy related numbers of the missing
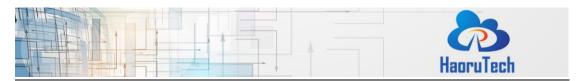
modules.

5) If you need to position 10 tags, then you need to get 4 anchors and 10 tags, which results in 14 modules.

We recommend buying 5 modules at least, for the following reasons:

1) 4 anchors positioning can cover two times the area than 3 anchors positioning.

2) There always some communication failure during the testing; for 4 anchors positioning method, it will finish the positioning by 3 anchors data out of 4, but for 3 anchors positioning method, it needs to finish the positioning by all 3 anchors data, which leads to reduce the success rate.

3) Also, 4 anchors & 1 tag can be reset to 3 anchors & 2 tags as well.

4. What is the positioning accuracy? Is the accuracy related to the area?

For XY positioning, the accuracy is 10cm (CEP95); for Z direction, the accuracy is 30cm (CEP95). There is no direct relationship between usage area and accuracy. There is no reducing accuracy when increase the usage area. But it should be noted that for the large power needed for ULM1-LD600, it will have an obvious multipath effect when use in 5*5cm area, so we recommend using it in a larger area.

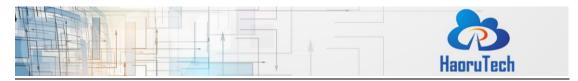5. Does the module have shell? Is it waterproof?

ULM1 does not have shell, LD150/LD600 have shell and external antenna. But the shell is not either sealed or waterproof.

6. How long is the battery standby time?

It depends on the external power supply capacity and emission frequency. For ULM1 equipped with matching power supply, the anchor standby time is approx. 10 hours, and the tag standby time is approx. 12 hours.

7. What the difference between RTLS1, RTLS2, RTLS3?

RTLS1, RTLS2, RTLS3 are the third generation UWB positioning product that developed by our company.

1) RTLS1 is based on the STM32 platform development kit, open source and available by two types:50m and 600m. It is suit for study assessment, study UWB underlying drive method, product source code migration, system integration and etc.

2) RTLS2 is productized equipment, closed source, communicate by ethernet, WEB interface. It is suit for application directly in the project.

3) RTLS3 is based on Arduino platform development kit, open source, the underlying drive is encapsulated and easy to redevelop. It is suit for study assessment, development research, project study in college, system integration and etc.

8. What is the update frequency for the tag?

The default frequency is 112ms, it can set to 10ms(6.8Mhz) for minimum

duration through modify the firmware parameter.

9.  How does the module connect with PC?

    The module uses USB port to connect with PC. It only requires one out of 4 anchors to connect with PC.

10. How does the module connect with the other embedded devices?

    The module uses UART-TTL port onboard to connect with the other embedded devices.

11. Do I need to buy other accessories after purchasing the system?

    The system provides matched portable power source and data cable. If the user needs to use it in the open air and need better stability and accuracy, we recommend buying tripods to hold the anchors. The height of the tripods had better not exceed 3m.

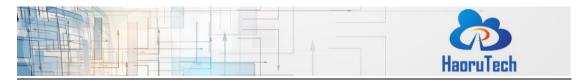12. Is the modular suit for the drone or AGV?

    There is no problem to use it for drone or AGV. Until now many customers use it in this way and get good feedback.

13. Is it easy to use?

    It is easy to build up the system with the help of video tutorial. It is also easy for redeveloping the system using development manual if the user has background knowledge of embedded development.
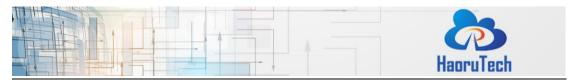
14. When can I get the full set of technical data?

    After purchasing, the user will need to build up the system and finish

testing according to the information in the package first to make sure the function will meet his need. If the product suit for the user, after confirming the payment, our customer service will send all the technical data to the user. If the product does not meet the user's need, he can return the product and get refund without damage the appearance of the product. The product will not be returned after the user receives the technical data.

15. How will the obstructions affect the positioning?

1) Wall: LD600 can pass through 1 solid wall, but error will increase about 30cm, depends on the material and thickness of the wall. ULM1, ULM3 cannot pass-through walls.

2) Wire pole, trees, and other long and narrow objects: Depends on the distance between tags and anchors. For example, if the distance between the tag and anchor is 60m, the obstruction will play little role on the result accuracy. But if the distance between the tag and anchor is only1 m, It will affect the result in a large part.

3) Glass: Glass will affect the accuracy of UWB positioning in a large part.

4) Steel, iron and other metal: Metal will absorb electromagnetic wave from the UWB, especially when it is closed to the modular. It will block signal and lead to no result.

5) Paperboard and wood board: it will not affect the result much if the thickness is about 10cm, but the signal will get reduction.

16. What is the probable reason for the low accuracy of the result.

1) Check whether the anchor coordinate on the upper computer software is correct.

2) Check whether the anchor height is above 1.8m.

3) Check if any signal of the anchors is too weak, then try to move the anchor to get better signal.

4) Check if there are any obstructions between the modular.

5) Check all the anchors are in the same plane (if the project requires).

6) Check if any tag is too far from all the anchors.

17. Why it says too close between the anchor and the tag?

1) In the situation of long-distance communication, we recommend to use tripods to hold the anchors and tags, and also keep the height above 1.8m during the testing.

2) Check if there is obstructions or strong electromagnetic interference around.

3) Check if antenna is installed in the right way.