

# **Product Description: MG2 Bluetooth AoA Positioning Kit**

MG2 Bluetooth AoA Positioning Kit is the second generation of high-precision indoor positioning kit launched by Minew, which adopts Angle of Arrival positioning technology to improve the positioning accuracy to the sub-meter level, and has a built-in positioning engine algorithm, which enables the user to directly obtain the precise location of people or assets without additional, complex positional solving, helping the user to reduce the development difficulty. This helps users to reduce the difficulty of development. At the same time, in order to better meet the market demand, the kit is based on a large number of professional experimental tests, constantly optimizing the antenna array and algorithm design to ensure high stability and low latency positioning. With simple deployment and high applicability, this kit can be widely used in the fields of warehousing and logistics, medical care, intelligent factories, transportation, culture and tourism, public prosecutors, law enforcement and other fields.

## **Features**

### **Wide-range monitoring with sub-meter accuracy**

MG2 single base station can realize basic positioning, the higher the deployment height of the base station, the wider the coverage, the higher the positioning accuracy. The maximum coverage radius is 2 times of the effective height from the label to the base station, and the maximum supported installation height can be as high as 10 meters, and the maximum high-precision positioning pitch angle of a single base station is 45°, which can reach below 0.5m. The positioning accuracy also decreases with the increase of the pitch angle, and also supports tilting installation and deployment to expand the scanning range.

### **Position solving, real scene simulation**

The system comes with a positioning engine algorithm that can solve the position data in real time, and users can directly view the (x,y) coordinates on the front end without data processing. Users only need to upload pictures to complete the real-life mapping, and adjust the deployment plan based on the simulation heat map. The system supports the management and configuration of base stations and labels, and supports a variety of functions such as real-time and historical track display, map management, etc., which is easy for users to use.

### **Large network capacity and high real-time performance**

A single base station supports a maximum of about 340 positioning terminals simultaneously (340 position solving/s), realizing the position monitoring of a large number of Bluetooth devices in the coverage area. The maximum position refresh frequency of the base station is 5Hz, and the dynamic delay is lower than 500ms, which can be used in the use of scenarios with higher requirements on delay.

### **Strong anti-interference ability, high stability**

The tag and base station work in the 2.4GHz free frequency band, support the use of private channel 2481MHz for broadcasting and receiving data, to avoid interference with other Bluetooth and WiFi products, and the positioning base station adopts high stability positioning antenna array design, which strongly ensures the stability of the signal and achieves better positioning effect.

### **Strong compatibility, easy integration**

It supports mobile terminals such as cell phones and tablet PCs, and is open to rich interfaces, so that users can access the data to the public or private cloud system and link with other systems, such as security video, time and attendance clocking, automatic inspection, etc., to implement more functionality.

### **application scenario**

Intelligent medical care  
Patient Management Healthcare Management  
Navigation Health Monitoring  
Equipment positioning Asset liquidation

### **Intelligent Warehouse & Factory**

Personnel positioning Intelligent deployment  
Process Optimization Quality Control  
Asset Tracking Quick Find

### **Smart Venue**

Passenger Management Marketing Optimization  
Navigation Service Enhancement  
Electronic Fence Security Escort

### **Smart Office**

Employee Management Attendance Performance  
Environment Monitoring Space Optimization  
Equipment Monitoring Asset Inventory

**Note:** The above application direction is only for reference, customers can realize more applications according to their own algorithm capability and a certain degree of software platform development technology.

## Kit composition

MG2 Bluetooth AoA positioning system mainly contains positioning base station, positioning tag and software system.

Positioning base station: The base station contains a highly stable positioning antenna array, which can realize data collection and transmit to the positioning system.

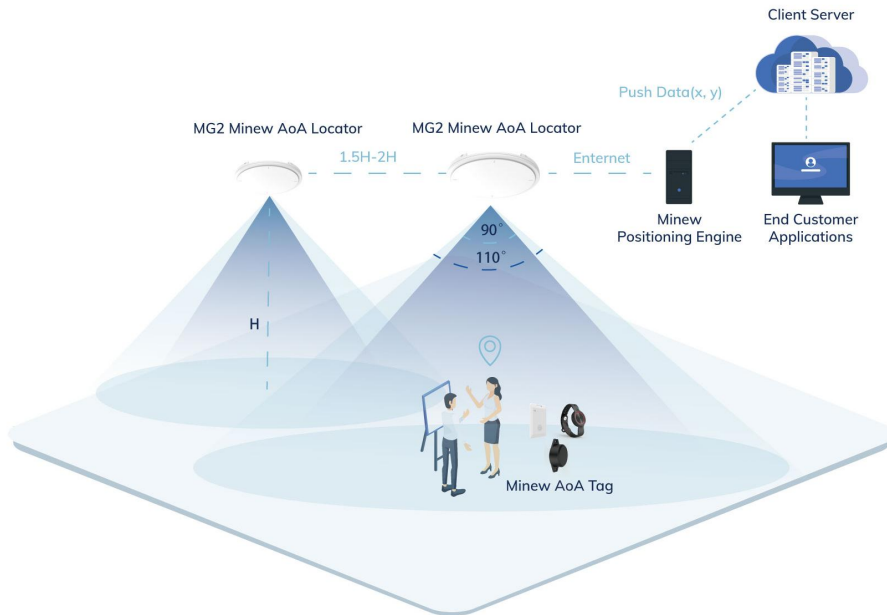
Positioning tag: low-power Bluetooth terminals that support Bluetooth 4.0 or above, such as wearable devices, smart sensors, asset tags, cell phone tablets, etc., to realize positioning with the base station.

Software system: The system contains positioning engine and control platform, the positioning engine receives data from the locator, runs advanced positioning algorithms to parse the data, and uploads the coordinate information to the platform, the user can realize the centralized control of positioning base stations and tags on the platform, and simulate the deployment of the base station through simple operation to visualize the coverage of the base station, which is conducive to the user's development of the deployment plan.

## Product Specification

Basic	Parameters
Model	MG2 Bluetooth AoA positioning base station
Material	ABS
Color	White
Weight	430g
Dimension	(L*W*H)180*180*36mm (without base and stand)
Power supply method	IEEE 802.3af POE power supply (typical 48V)
Power Output	Approx 1W
Network protocol	TCP/IP protocol
Operating Frequency	2.4~2.4835GHz
Communication Channel	2481MHz (default)
Signal Bandwidth	1Mbps
Receiving sensitivity (1Mbps)	-93dBm
Positioning Accuracy	0.3~1m (related to BTS deployment density and height)
Throughput	340 packets/sec/base station
Coverage Area	90°angle directly below
Firmware Upgrade	Ethernet Upgrade
Mounting method	Screw mounting, magnet mounting
Operating Environment	Indoor
Operating Temperature	-25~60°C, 5%~93%RH, non-condensing
Storage temperature and humidity	0~50°C, 65±20%RH, non-condensing

## Workflow Schematic



**Note:** Height  $H$  is the effective height of the AoA positioning tag from the base station. The data output from the positioning engine is the settled  $(x, y)$  coordinate data

- ① First, install the system on the computer according to the System Operation Manual, and import the map to simulate the deployment effect, make adjustments and formulate the deployment plan according to the actual situation.
- ② Install the base station in the actual environment according to the deployment plan, which can be referred to in the Base Station Installation Manual, and bind the location tags to the assets, personnel, or equipment.
- ③ Refer to the System Operation Manual to bind the base station with the system to realize the building of the positioning project, and at the same time, you can configure the positioning base station and tags.
- ④ After the project is built, the positioning base station will collect the tag signals within the range, calculate the tag location, and users can view the location information in real time on the platform.

## Cautions

Positioning base station can only be powered by POE switch and connected to the base station through the network cable, if the length of the cable is more than 90 meters, it is recommended to use Category 6 and above cable, try not to exceed 150 meters.

The base station is deployed as far away as possible from corners, metal objects, and coverings to get better positioning effect, and to ensure firmness and avoid swinging or falling.

The actual installation environment is different, the positioning effect and the density of the installation will also be different. The installation height of the base station will also have an impact on the coverage area.

When installing the base station, try to install it horizontally and point it in a uniform direction (it is recommended to point it in the positive direction of the map's Y-axis), otherwise, it is necessary

to compensate for it on the system; the direction can be indicated by the LED light on the housing. For more information about base station and localizer deployment, please contact our business team to get the "Base Station Installation Manual" and "System Operation Manual" documents for review.

### **Quality Assurance**

The factory has passed ISO9001 quality system certification. Each product is strictly tested (transmit power test, sensitivity test, power consumption test, stability test, aging test, etc.).

Product warranty: 12 months from the date of shipment (except batteries and other accessories).

### **Statement**

#### **Rights statement:**

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Minew Technology Co., Ltd. reserves the right of final interpretation of the differences between this manual and the actual product. The company does not assume responsibility for property or personal injury caused by abnormal operation of the customer, please follow the technical specifications in the manual and reference design development of the corresponding products.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

#### **FCC warning:**

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.