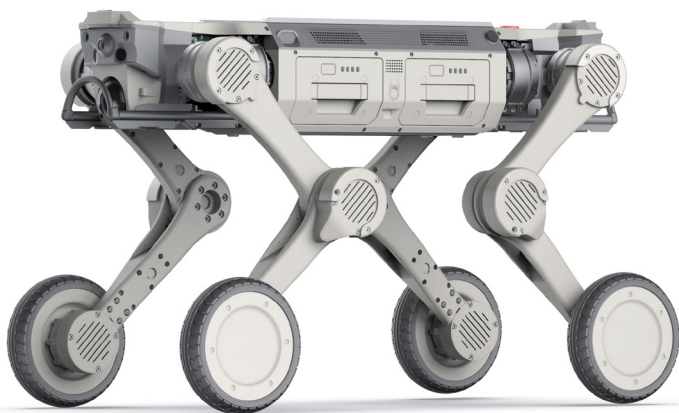


铜锤 M1/M1 Pro 智航 Pro 产品说明书



版本号：V0.1

尊敬的用户：

本声明（以下简称“本声明”）由智身科技（以下简称“本公司或我们”）与您就智航产品（定义见下文）的使用事宜订立。在使用本产品前，请您务必审慎阅读、充分理解本声明全部条款。一旦您开始使用本产品，即视为您已阅读、理解并同意接受本声明的全部约束。

第一条 产品定义

- 本手册所称“智航产品”是指【自主导航的软件】。

第二条 使用前义务

- 您在使用本产品前，应当仔细阅读并充分理解本手册全部内容，包括但不限于“功能适用范围”“注意事项”“故障排除”等章节，并严格按照本手册的指引操作本产品。
- 如因您违反本手册任何内容进行操作而造成的任何损失，包括但不限于财产损失、人身伤害、数据丢失等，本公司概不承担任何责任。

第三条 产品物理属性说明

- 本手册已尽可能包含本产品的功能介绍和使用说明，但由于功能持续完善及设计变更等原因，实物与手册内容可能存在差异。如实物与本手册在颜色、外观、配件等方面存在出入，请以实物为准。

第四条 软件算法局限性

- 本产品所搭载的自主导航功能基于复杂的软件算法实现。您理解并确认，受当前技术发展水平限制，任何软件算法均无法覆盖全部实际使用场景。
- 在特定环境条件下（包括但不限于光照不足、场景特征稀疏、动态障碍物复杂、极端天气、强电磁干扰、GPS 信号缺失等），可能出现包括但不限于定位偏差、路径规划失误、避障失效、地图构建不完整、回充对接失败等情况。

- 本产品按“现状”及“当前可用”的基础提供，本公司不对软件算法在任何场景下的性能表现作任何形式的明示或默示保证，包括但不限于适销性、特定用途适用性、可靠性或准确性保证。

第五条 人工监控义务

- 本产品为辅助性智能设备，不具备完全的自主判断与决策能力。您在使用过程中必须全程保持对机器狗运行状态的直接视距监控，密切关注机器狗周围环境变化及运行状态。
- 您应当随时准备采取紧急制动、暂停任务、终止运行等人工干预措施。对于动态障碍物（包括但不限于行人、车辆、动物等），您应当保持高度警惕，及时预判潜在风险并进行干预。
- 因您未能履行上述监控义务、未及时采取干预措施或干预措施不当而导致的任何损失，包括但不限于机器狗损坏、第三方财产损失、人身伤害等，均由您自行承担全部责任。

第六条 功能适用范围限制

- 本产品各项功能均受本手册“功能适用范围”及“注意事项”章节所列条件及参数要求的严格限制，包括但不限于适用场景、建图速度、地图面积、定位条件、巡航速度、通行宽度、避障空间、回充环境等具体技术指标。
- 超出上述范围使用本产品（包括但不限于在不适用场景、不适用环境条件、不满足参数要求的情况下使用）而导致的任何功能失效、性能下降、机器狗损坏或其他损失，本公司不承担任何责任。

第七条 责任限制

- 在法律允许的最大范围内，本公司不对因使用或无法使用本产品而引起的任何间接

性、偶然性、特殊性、惩罚性或后果性损害赔偿承担责任，包括但不限于利润损失、商誉损失、数据丢失、业务中断、替代产品或服务的采购成本等，即使本公司已被告知该等损失的可能性。

- 在任何情况下，本公司因本产品所承担的累计赔偿责任总额，不应超过您为购买本产品所实际支付的金额。

第八条 知识产权

- 本产品（包括但不限于软件代码、目标代码、应用程序、界面设计、技术文档、API 接口、算法模型等）所包含的所有知识产权，包括但不限于著作权、商标权、专利权、商业秘密及其他专有权利，均归本公司或其许可方所有。
- 未经本公司书面许可，您不得对本产品进行反向工程、反编译、反汇编、破解、复制、修改、分发、出租、许可、转让或创作衍生作品。

第九条 法律适用与争议解决

- 本声明的解释、效力、履行及纠纷解决，均适用中华人民共和国法律。
- 因本声明或使用本产品引起的任何争议，双方应首先友好协商解决；协商不成的，任何一方均有权向本公司住所地有管辖权的人民法院提起诉讼。

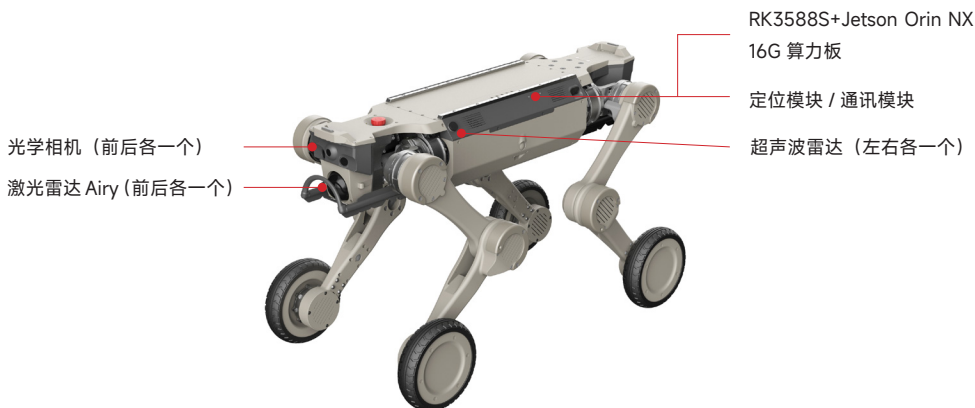
第十条 其他

- 本公司保留对本声明进行修改和解释的权利。如本声明发生变更，变更后的版本将在本公司官方网站或相关渠道公布。变更后的声明自公布之日起生效。
- 如本声明的任何条款被有权机关认定为无效或不可执行，不影响其他条款的效力。

01 产品介绍	1
1.1 导航硬件配置	1
1.2 导航功能	1
02 功能适用范围	3
03 注意事项	4
04 产品使用	4
4.1 网络配置	4
4.2 APP 使用说明	5
4.2.1 产品介绍	5
4.2.2 操作说明	9
05 二次开发说明	16
06 软件升级操作	16
07 故障排除	16

1.1 导航硬件配置

导航套件中包含算力板、激光雷达、超声波雷达、光学相机、定位模块，通讯模块，具备 100Tops 超大算力，支持用户进行环境感知、定位、自主导航等功能的开发。



1.2 导航功能

- **建图：**该功能允许用户通过 APP 操控机器狗完成对环境的学习与记录，构建出一张可用于导航 2D 地图。在此过程中，系统能够有效区分出可供通行的区域和不可通行区域，为后续所有自动化任务提供准确的空间感知信息。
- **定位：**自主导航的“认知中枢”。该功能不仅用于实时确定机器狗在已建地图中的精确位置，更是其执行“去哪里”和“怎么去”等一切自主决策的根本依据。用户只需将机器狗置于已建图环境中，系统便可自动完成定位，确保后续导航任务拥有可靠、准确的行动起点。
- **导航：**用户可选择建图路线或预设巡航路线，定位成功后，可进行路线规划并开始导航。机器狗将根据地图信息，自动计算出一条从当前位置到目的地的最优安全路径，并自主导航至目标，完成巡航、巡检等多点任务。
- **避障：**在自主导航过程中，该功能提供持续的安全保障。机器狗能够实时探测前方路径上的动态行人或静态障碍物，并主动、平滑地进行绕行。当遇到无法绕行的情况时，机器狗将安全、平稳地刹停，等待后续指令或环境变化。

※ 当前，该产品的各项性能指标正处于持续优化与迭代升级阶段，后续将通过系统的软件更新，不断提升产品的综合能力与场景适应性。

分类	具体内容
适用场景	支持室内及室外单层常规场景，如小区、办公楼大厅、园区等。需在特征点丰富的环境下使用，要求机器狗本体 15 米范围内非地面点云丰富，需避开玻璃墙面、长距离无特征墙体等弱纹理环境
	适应地面类型：水泥路、沥青、地毯、瓷砖亚光等。需避开高反光地面及草地行驶
	适用天气：光照强度 $\geq 10000\text{lux}$ （室外白天），雨水量： $< 2.5\text{mm/h}$ （毛毛雨，地面无积水），降雪量：地面积雪深度 $\leq 5\text{mm}$
建图	需在机器狗站立状态以 $< 1\text{m/s}$ 的速度遥控建图，建议 0.6m/s 的速度
	单张地图建图里程 $< 1\text{km}$ ，建图时间约 20 分钟
	为保障建图质量，建议机器狗从起点开始，沿原路行驶过起点回环 $\geq 15\text{m}$ 进行闭环建图
定位	机器狗起始朝向应与原始建图方向的偏差 $< 30^\circ$
	机器狗应位于建图路径 2m 范围内
	在巡航时，建议将机器狗开始巡航的起点位于建图的起点
	机器狗巡航过程中，需避免前后激光雷达被障碍物遮挡，机器狗本体 15m 内激光雷达达到的非地面数量点 > 5000 个
巡航	巡航速度为 0.6m/s
	通行窄路宽度需 $>$ 机器狗本体宽度 $+ 60\text{cm}$
	支持前向直行、转弯、掉头，不支持倒退脱困
避障	动静态障碍物绕行空间宽度：宽度 $>$ 机器狗本体宽度 $+ 60\text{cm}$ 。支持避让行人；暂不支持运动过程中的车辆、两轮车的避障
	支持在机器狗视野 115° 范围内静态障碍物的避障，可支持高度 $> 30\text{cm}$ 、宽度 $> 30\text{cm}$ 、材质反射率 $\geq 10\%$ 的障碍物
	悬空障碍物通过条件：悬空高度 $>$ 机器狗高度 $+ 30\text{cm}$ ，且仅支持站立姿态通过
	前向激光雷达前方 30cm 范围内为感知盲区，当障碍物进入该区域时，建议及时接管控制，避免碰撞

03 注意事项

序号	内容
1	请定期检查激光雷达及相机镜头表面是否有灰尘或油污，感知数据的质量直接决定建图精度与避障可靠性
2	芯片在进行高强度连续运行时会产生较多热量，请确保机器人处于通风良好的环境，避免因高温导致芯片降频，影响整体功能稳定
3	机器狗与 APP 终端通过 WiFi 连接，使用时建议保持近距离，以便信号稳定传输
4	若初始定位失败，请将机器人移动至原建图轨迹区域，并确保机体航向与地图初始方向一致，随后重新发起重定位
5	自主巡航时须全程保持视距监控。若避障异常，请立即触发紧急制动，以防碰撞损坏
6	自主巡航时，需对快速行驶的车辆、二轮车等重点关注，避免发生碰撞
7	建图和巡航前，请确保电量充足
8	请选择光照充足、气象晴朗的时段进行建图与自主巡航，以获得最优的感知反馈与定位结果
9	建图和巡航时，建议在特征点比较丰富的场景下使用，尽可能的避免长走廊、玻璃等特殊场景下通行
10	受当前软件版本性能特征限制，地图加载及定位初始化过程耗时可能较长，请关注后续更新计划
11	机器狗在巡航动态行驶过程中，需避免障碍物大面积的遮挡前后激光雷达的视野范围，易导致定位丢失

4.1 网络配置

连接机器狗 WIFI 热点 (以 M1 开头), 点击右下角的设置按钮, 型号选择小狗, 默认是小狗, 如果不是, 选择后, 关闭 APP, 重启 APP。



进入远程控制，看 APP 上是否有视频流，以及能否正常前后左右移动。



4.2 APP 使用说明

※ 本操作指南旨在引导您了解 APP 的核心功能与使用流程。产品处于持续迭代中，部分界面与功能可能优化调整，请您以实际拿到产品的最终界面和功能为准。为获得最佳体验，推荐使用 Xiaomi Pad 7 和安卓手机进行操作。

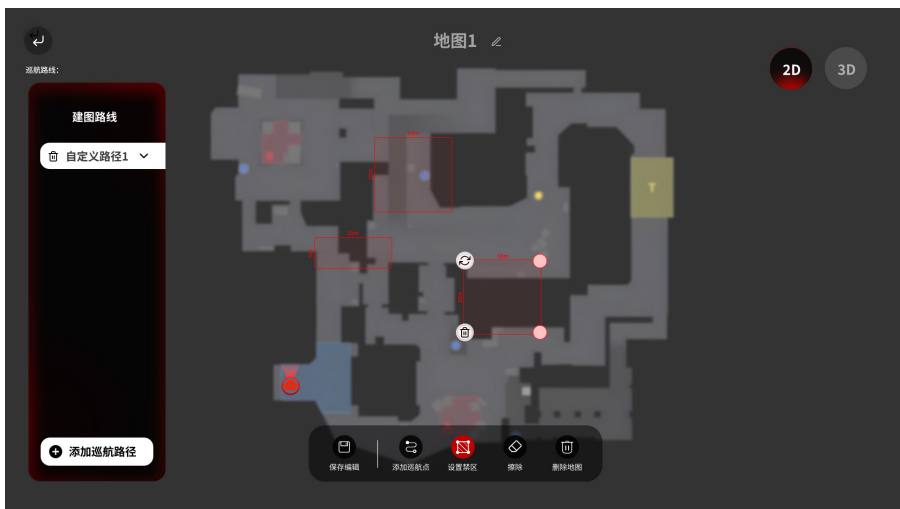
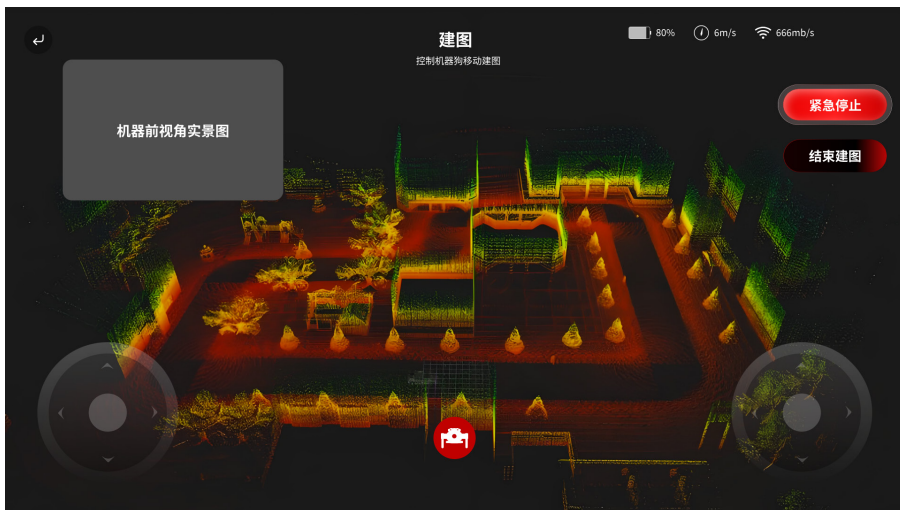
4.2.1 产品介绍

本 APP 为机器狗导航功能的专属控制终端，为用户提供从建图、任务规划、地图管理、实时监控的全链路的自主导航操控能力。

核心区域功能介绍

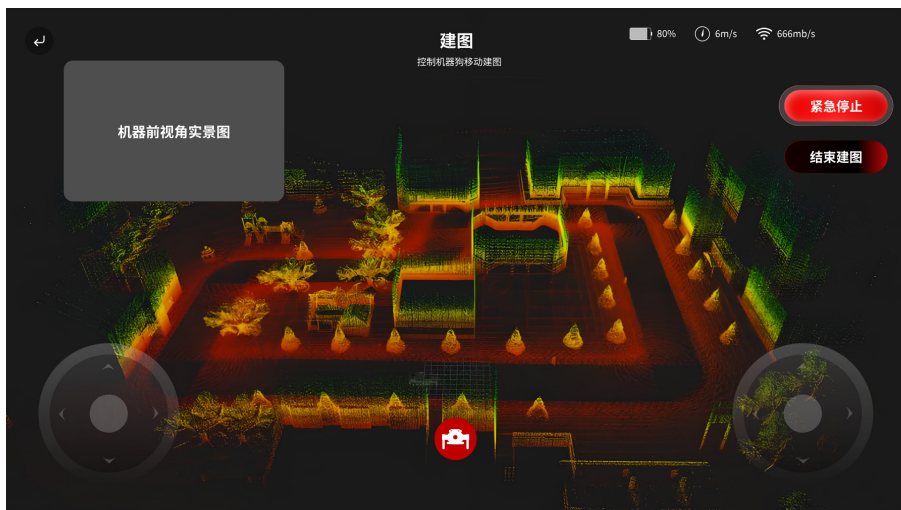
A. 地图显示区

APP 核心区域，建图时，实时显示 3D 点云，建图完成后，可生成 2D 地图，可在 2D 地图进行编辑，巡航时，实时显示机器狗位置和行驶轨迹，实时跟踪状态。



C.实时视频窗

可悬浮于地图之上，显示机器狗前方实时画面，用于第一视角监控，同时，在操控时，实景图全屏，可实时看到机器狗行驶的动作。



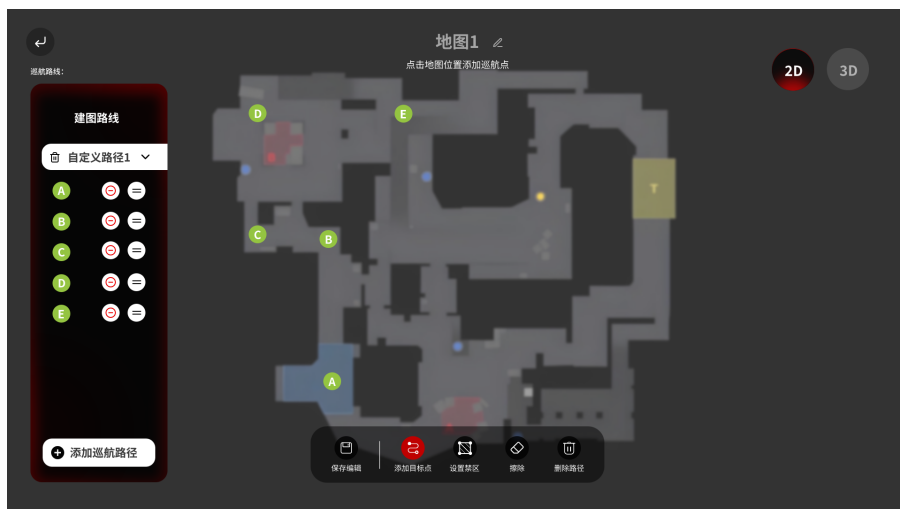
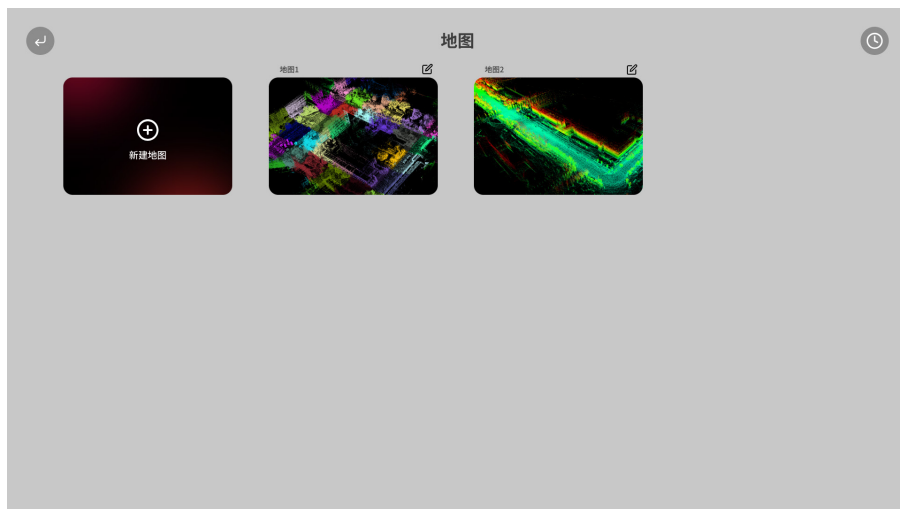
B.核心控制区

位于界面底部或右侧，聚合了全场景下的高频操作的控件 / 功能按钮，包括虚拟摇杆、模式切换、急停、暂停以及开始 / 结束巡航等关键按钮，旨在确保用户在建图、巡航及手动操控等各类任务中均能获得流畅连贯的交互体验。



D.地图管理

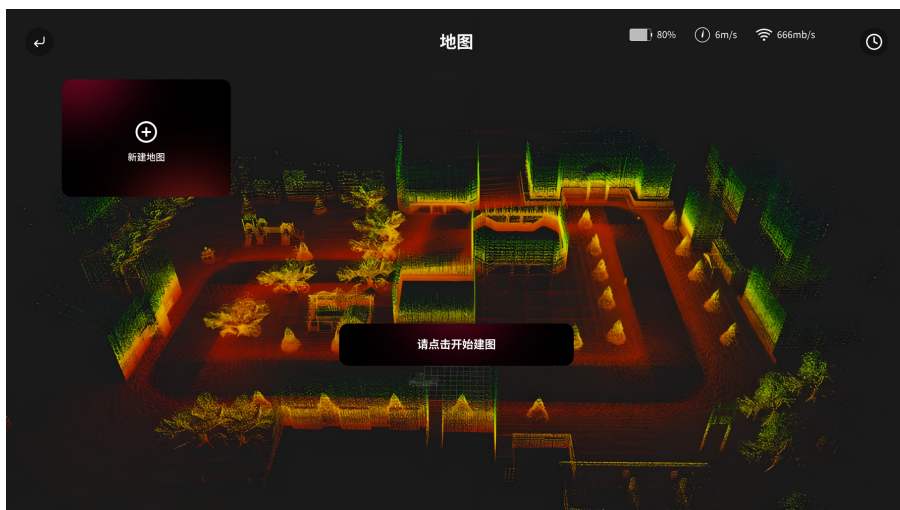
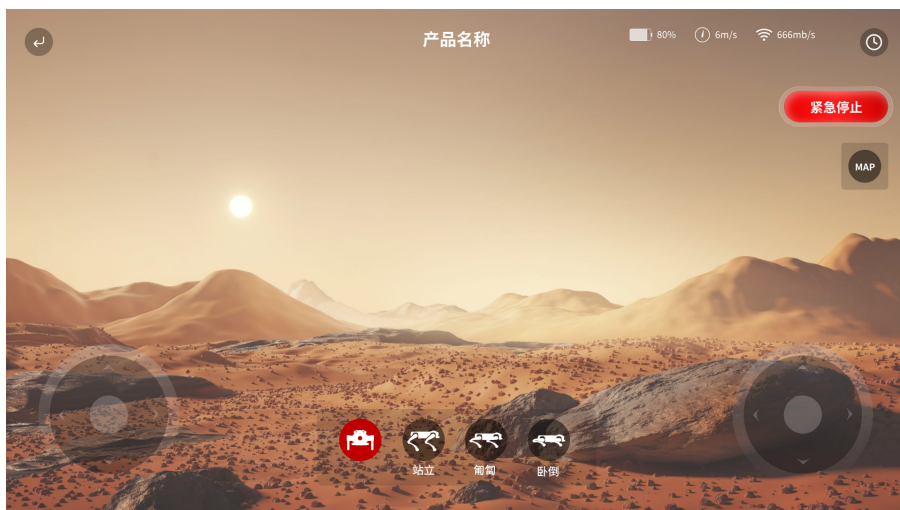
分为地图管理和地图编辑。地图管理中可进行地图的删减及命名；地图编辑中，可对地图进行禁区围栏的设定，同时可自定义路径进行巡航点的设置。以保证用户的任务灵活编排。



4.2.2 操作说明

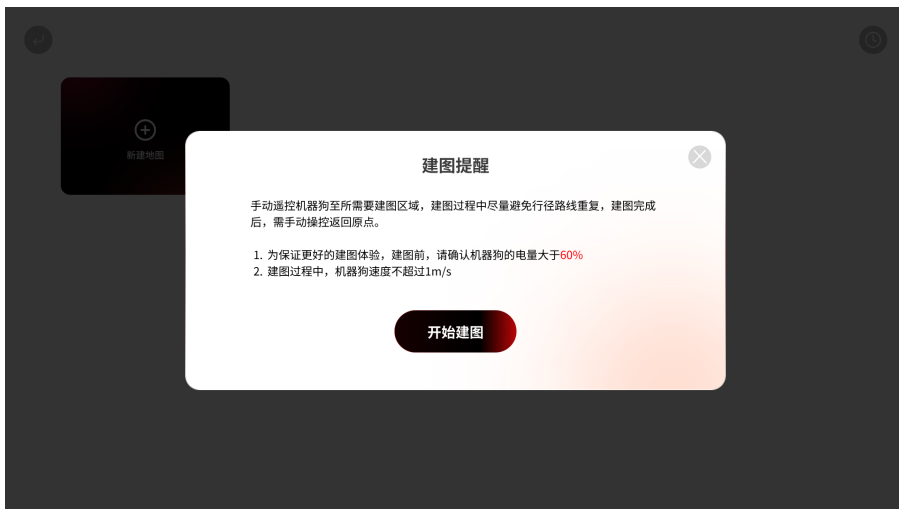
建图

- 入口：在操控页，点击【MAP】，进入到地图管理页面，点击【新建地图】，可开始建图。

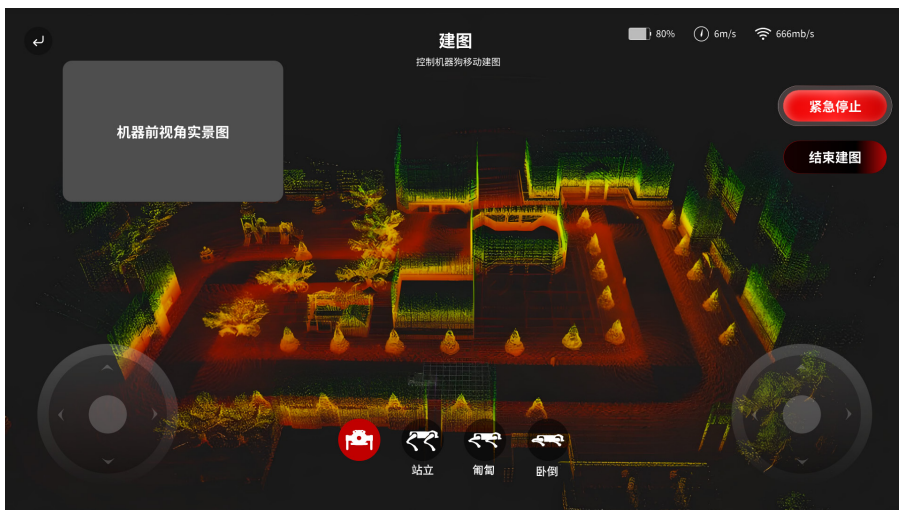


• 流程

A) 开始建图页：在满足电量及建图条件的情况下，新建地图后，可点击【开始建图】。



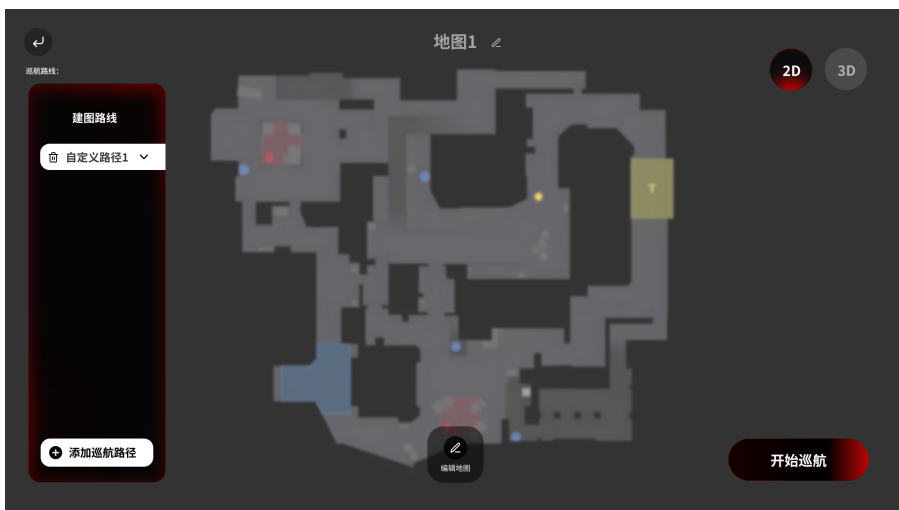
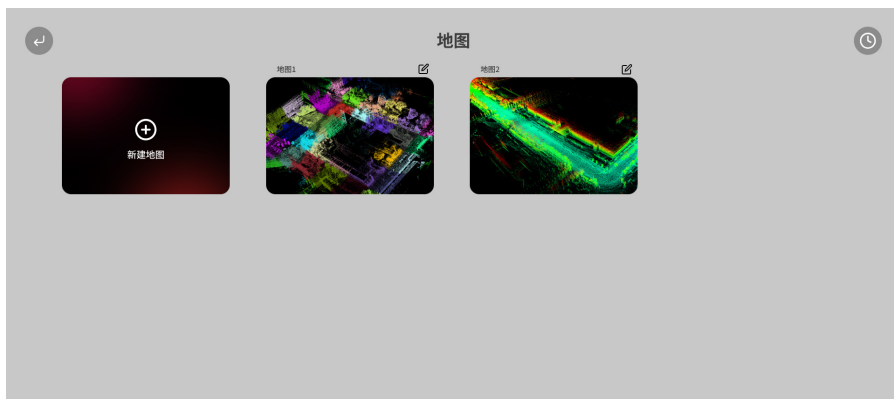
B) 建图过程页：建图时，需控制【操控按键】，进行建图；建图中可进行机器狗的动作切换，遇到突发情况，可点击【急停】。画面中实时显示 3D 点云的感知效果及机器狗的实景显示。



C) 结束建图页：在建图页中，点击【结束建图】后，会进行地图保存，保存成功后，即可对该地图进行编辑，或沿建图路线执行巡航任务。

地图编辑

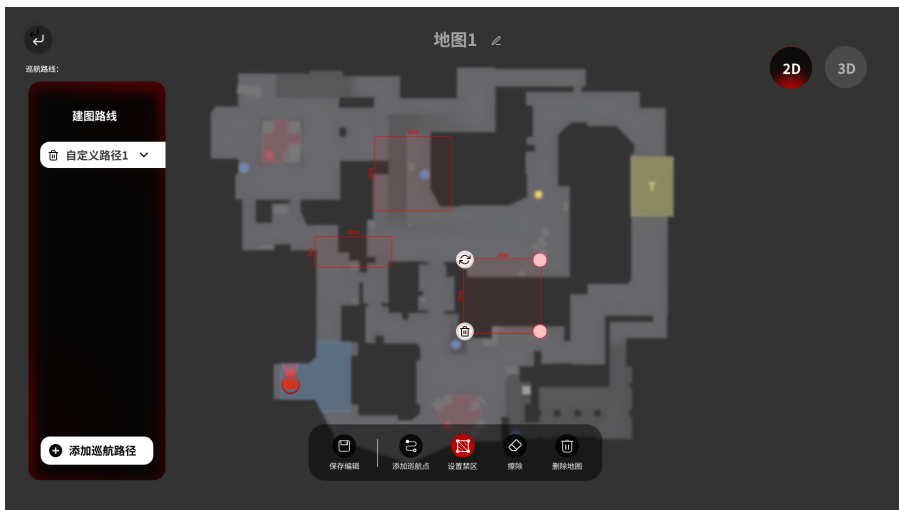
- 入口：地图管理页面中，点击【已建地图】，对地图进行【编辑地图】。



- 核心编辑功能

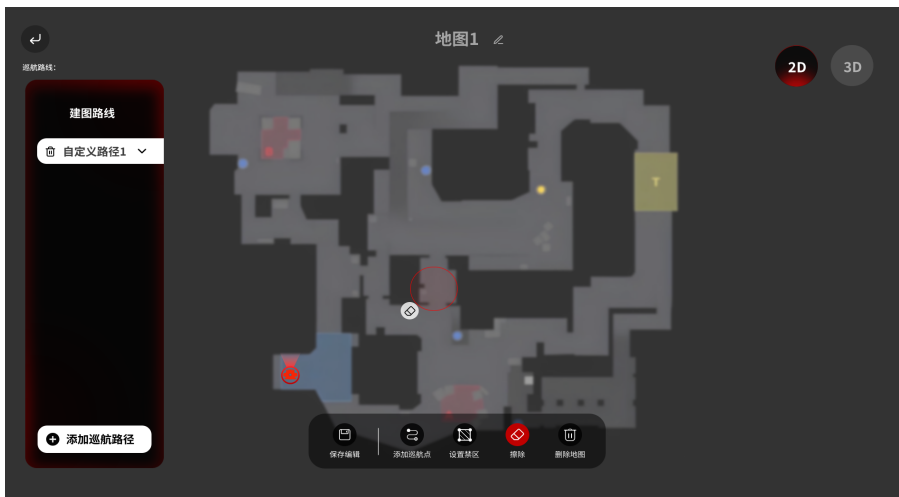
A) 设置禁区

- a) 点击【设置禁区】，可进行地图禁止通行区域的编辑。
- b) 禁区图形支持缩放、旋转、移动、删除等调节。



B) 擦除

- a) 点击【擦除】，可进行对地图中的一些噪点进行擦除，擦除时请勿将障碍物进行擦除。
- b) 擦除图形支持缩放、旋转、移动、删除等调节。



C) 添加巡航点

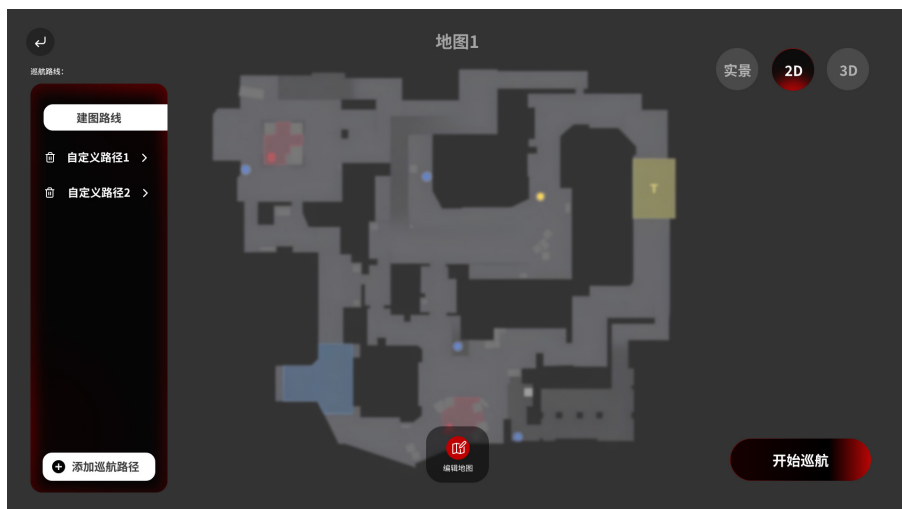
- 点击【添加巡航点】，可在地图上设置一系列巡航点，以编排自动巡航任务。
- 可对巡航点进行顺序调整、删除，以及长按设置机器狗抵达该点时的朝向。
- 保存编辑后，机器狗即可按此自定义路径执行巡航。



⚠️ **注意事项：** 编辑地图过程中, 需在2D地图上操作, 且编辑内容不能超过地图区域。

巡航

- 入口：在路线列表中，点击【建图路线】或【自定义路线】选定后，可开始巡航。



- 流程

A) 开始巡航页：点击【开始巡航】后，会检测定位和路径规划，成功后，机器狗开始巡航。



B) 巡航过程页：巡航过程中，点击【暂停】可临时暂停巡航，点击【继续】可恢复执行，若需终止任务，可点击【结束巡航】。画面中实时显示巡航的路径及巡航点执行的情况。



C) 结束巡航页：在巡航中，点击【结束巡航】或到达终点的自动结束巡航。巡航完成后，界面将完整显示本次巡航的路径。若结束时机器狗未处于起始点，可点击【回程】按钮，机器狗将自动巡航返回起点。



05 二次开发说明

※ 请联系技术支持

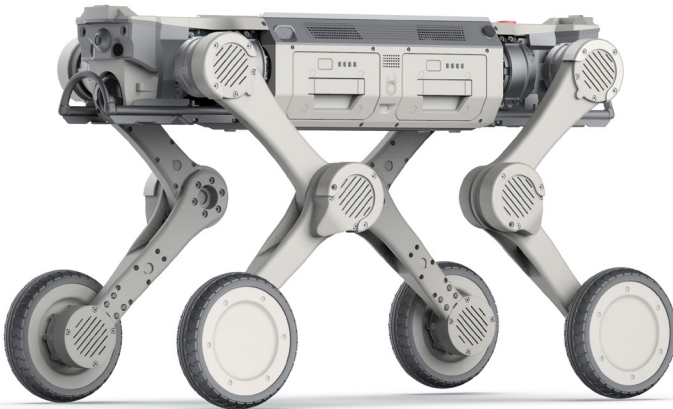
06 软件升级操作

※ 请联系技术支持

07 故障排除

常见问题	处理措施
建图时提示当前状态不允许建图	重启 NX

Genisom M1/M1 Pro Roamer X Pro Product Manual



Version Number: V0.1

Dear User:

This Notice (hereinafter referred to as "this Notice") is entered into by Genisom AI (hereinafter referred to as "the Company," "we," or "us") and you regarding the use of the Smart Navigation Product (as defined below). Before using this product, you must carefully read and fully understand all terms of this Notice. Once you start using this product, you are deemed to have read, understood, and agreed to be bound by all provisions of this Notice.

Product Definition

- The "Smart Navigation Product" as referred to in this manual means [autonomous navigation software].

Pre-use Obligations

- Before using this product, you should carefully read and fully understand all contents of this manual, including but not limited to the "Functional Scope," "Precautions," and "Troubleshooting" sections, and operate the product strictly in accordance with the instructions in this manual.
- The Company shall not be liable for any losses caused by your failure to comply with any content of this manual during operation, including but not limited to property damage, personal injury, data loss, etc.

Physical Product Attributes

- This manual contains the product's functions and instructions to the best of our ability. However, due to continuous functional improvements and design changes, the actual product may differ from the manual's description. If discrepancies exist between the actual product and this manual in terms of color, appearance, accessories, etc., the actual product shall prevail.

Software Algorithm Limitations

- The autonomous navigation function of this product is realized through complex software algorithms. You understand and acknowledge that, due to current technological limitations, no software algorithm can cover all real-world usage scenarios.
- Under specific environmental conditions (including but not limited to insufficient lighting, sparse scene features, complex dynamic obstacles, extreme weather, strong electromagnetic interference, GPS signal loss, etc.), situations may occur including but not limited to positioning deviation, path planning errors, obstacle avoidance failure, incomplete map construction, and charging return docking failure.
- This product is provided on an "AS IS" and "AS AVAILABLE" basis. The Company makes no express or implied warranties regarding the performance of the software algorithm in any scenario, including but not limited to warranties of merchantability, fitness for a particular purpose, reliability, or accuracy.

Human Monitoring Obligation

- This product is an auxiliary smart device and does not possess full autonomous judgment and decision-making capabilities. During use, you must maintain direct visual line-of-sight monitoring of the robot dog's operating status at all times, closely observing changes in the surrounding environment and the robot dog's operational state.
- You must always be prepared to take manual intervention measures such as emergency braking, pausing the task, or terminating operation. You should remain highly vigilant regarding dynamic obstacles (including but not limited to pedestrians, vehicles, animals, etc.), promptly anticipating potential risks and intervening.

- Any losses resulting from your failure to fulfill the above monitoring obligations, failure to take timely intervention measures, or improper intervention measures, including but not limited to damage to the robot dog, third-party property damage, or personal injury, shall be borne solely by you.

Functional Scope Restrictions

- All functions of this product are strictly limited by the conditions and parameter requirements listed in the "Functional Scope" and "Precautions" sections of this manual, including but not limited to applicable scenarios, mapping speed, map area, positioning conditions, cruising speed, passage width, obstacle avoidance space, charging return environment, and other specific technical indicators.
- The Company shall not be liable for any functional failure, performance degradation, damage to the robot dog, or other losses resulting from using this product beyond the specified scope (including but not limited to use in unsuitable scenarios, unsuitable environmental conditions, or where parameter requirements are not met).

Limitation of Liability

- To the fullest extent permitted by law, the Company shall not be liable for any indirect, incidental, special, punitive, or consequential damages arising from the use or inability to use this product, including but not limited to loss of profits, loss of goodwill, data loss, business interruption, cost of substitute products or services, even if the Company has been advised of the possibility of such damages.
- In any event, the Company's total cumulative liability arising from this product shall not exceed the amount you actually paid for purchasing this product.

Intellectual Property

- All intellectual property rights contained in this product (including but not limited to software code, object code, application programs, interface design, technical documentation, API interfaces, algorithm models, etc.), including but not limited to copyrights, trademark rights, patent rights, trade secrets, and other proprietary rights, belong to the Company or its licensors.
- Without the Company's written permission, you shall not reverse engineer, decompile, disassemble, crack, copy, modify, distribute, rent, license, transfer, or create derivative works of this product.

Governing Law and Dispute Resolution

- The interpretation, validity, performance, and dispute resolution of this Notice shall be governed by the laws of the People's Republic of China.
- Any dispute arising from this Notice or the use of this product shall first be resolved through friendly negotiation between the parties; if negotiation fails, either party has the right to bring a lawsuit to the competent people's court in the place where the Company is domiciled.

Miscellaneous

- The Company reserves the right to modify and interpret this Notice. If this Notice is changed, the revised version will be published on the Company's official website or relevant channels. The revised Notice shall take effect from the date of publication.
- If any provision of this Notice is deemed invalid or unenforceable by a competent authority, the validity of the other provisions shall not be affected.

01 Product Introduction 1

 1.1 Navigation hardware configuration 1

 1.2 Navigation Function..... 1

02 Function Scope 3

02 Function Scope 4

03 Precautions 5

04 Product Usage..... 6

 4.1 Network Configuration..... 6

 4.2 APP Usage Instructions 7

 4.2.1 Product Introduction 7

 4.2.2 Operation Instructions..... 11

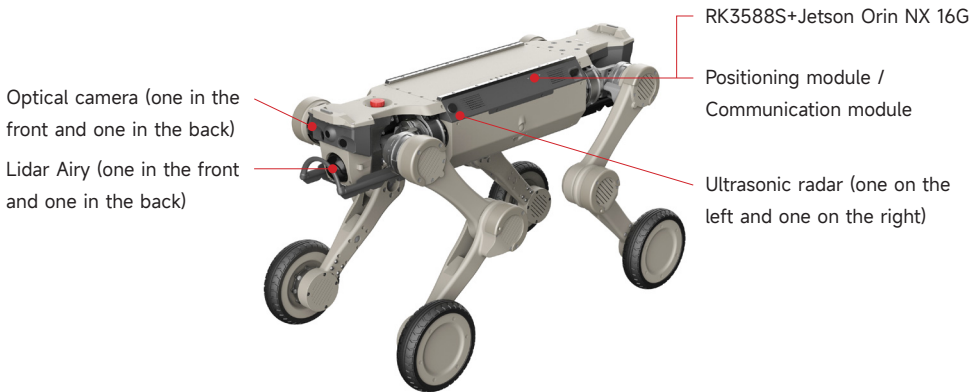
05 Secondary Development Instructions 18

06 Software Upgrade Operation..... 18

07 Troubleshooting..... 18

1.1 Navigation Hardware Configuration

The navigation kit includes a computing board, lidar, ultrasonic radar, optical camera, positioning module, and communication module. It features 100 TOPS of ultra-high computing power, supporting users in developing functions such as environmental perception, positioning, and autonomous navigation.



1.2 Navigation Function

- **Mapping:** This function allows users to control the robotic dog through the APP to complete the learning and recording of the environment, constructing a 2D map that can be used for navigation. During this process, the system can effectively distinguish between passable and impassable areas, providing accurate spatial perception information for all subsequent automated tasks.
- **Localization:** The "cognitive center" of autonomous navigation. This function not only determines the precise position of the robotic dog in the built map in real time but also serves as the fundamental basis for all autonomous decision-making, such as "where to go" and "how to get there". Users simply need to place the robotic dog in the mapped environment, and the system can automatically complete localization, ensuring that subsequent navigation tasks have a reliable and accurate starting point.
- **Navigation:** Users can choose a mapping route or a preset cruising route. After successful localization, route planning can be carried out and navigation can be started. The robotic dog will automatically calculate an optimal and safe path from its current position to the

destination based on the map information, and autonomously navigate to the target to complete multi-point tasks such as cruising and inspection.

- **Obstacle Avoidance:** During autonomous navigation, this function provides continuous safety assurance. The robotic dog can detect dynamic pedestrians or static obstacles on the path ahead in real time and actively and smoothly detour around them. When encountering situations where detouring is impossible, the robotic dog will safely and smoothly brake to a stop, waiting for subsequent instructions or environmental changes.

※Currently, all performance indicators of this product are in the stage of continuous optimization and iterative upgrading. Subsequently, through systematic software updates, the product's comprehensive capabilities and scenario adaptability will be continuously enhanced.

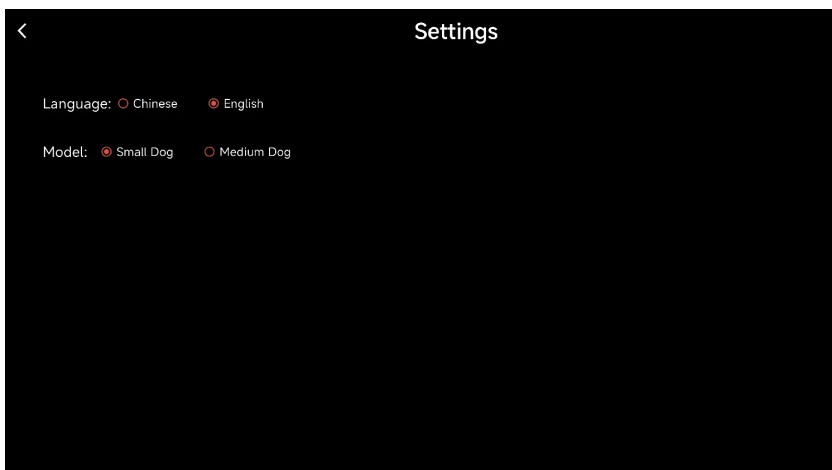
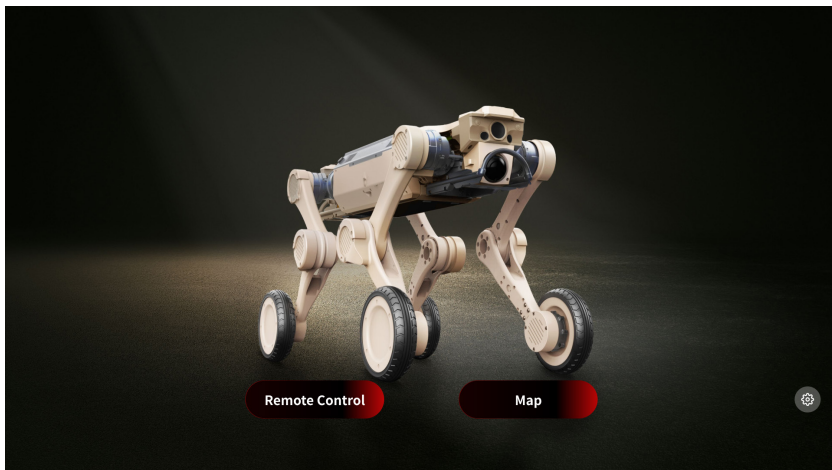
Classification	Specific content
Applicable Scenarios	Supports indoor and outdoor single-layer conventional scenarios, such as residential communities, office building lobbies, industrial parks, etc. Must be used in environments rich in feature points, requiring that the non-ground point cloud within 15 meters of the robot dog's body be abundant. Avoid weak-texture environments such as glass walls and long featureless corridors.
	Suitable ground types: cement, asphalt, carpet, matte tile, etc. Avoid highly reflective ground and grass.
	Applicable weather: Light intensity $\geq 10,000$ lux (outdoor daytime), rainfall < 2.5 mm/h (drizzle, no standing water), snowfall: ground snow depth ≤ 5 mm.
Mapping	Mapping must be performed remotely at a speed of < 1 m/s with the robot dog in a standing state. 0.6 m/s is recommended.
	Single map mileage < 1 km, mapping time approximately 20 minutes.
	To ensure mapping quality, it is recommended that the robot dog starts from the starting point, drives along the original path, and performs loop closure by passing through the starting point with a loop distance ≥ 15 m.
Positioning	The deviation between the robot dog's initial orientation and the original mapping direction should be $< 30^{\circ}$.
	The robot dog should be located within 2 m of the mapped path.
	When cruising indoors, it is recommended to start the cruise from the mapping starting point.
	During the patrol of the robotic dog, it is necessary to avoid occlusion of the front and rear LiDAR sensors by obstacles. The number of non-ground points detected by the LiDAR within 15 meters of the robotic dog body must exceed 5000.

cruise	The cruising speed is 0.6 m/s.
	Passable narrow road width must be > robot dog body width + 60 cm.
	Supports forward straight movement, turning, and U-turns. Does not support reversing to get out of trouble.
Obstacle Avoidance	Maneuvering space width for dynamic and static obstacle avoidance: width > robotic dog body width + 60 cm. Pedestrian avoidance is supported; obstacle avoidance for moving vehicles and two-wheeled vehicles is currently not supported during motion.
	Obstacle avoidance for static obstacles is supported within a 115° field of view of the robotic dog, applicable to obstacles with height > 30 cm, width > 30 cm, and material reflectivity ≥ 10%.
	Conditions for passing under suspended obstacles: Suspended height > robot dog height + 30 cm, and only supported when passing in a standing posture.
	The forward lidar has a perception blind zone within the first 30 cm directly in front of it. When an obstacle enters this area, it is recommended to immediately take over control to avoid collision.

No.	Content
1	Please regularly check whether there is dust or oil on the surface of the lidar and camera lens, as the quality of perception data directly determines the accuracy of mapping and the reliability of obstacle avoidance
2	The chip generates a significant amount of heat during high-intensity continuous operation. Please ensure that the robot is in a well-ventilated environment to prevent the chip from downclocking due to high temperatures, which could affect the overall functional stability.
3	The robotic dog is connected to the APP terminal via WiFi . It is recommended to maintain a short distance during use to ensure stable signal transmission
4	If the initial positioning fails, please move the robot to the original mapping trajectory area, ensure that the robot's heading is consistent with the initial direction of the map, and then initiate repositioning again
5	During autonomous cruising, line-of-sight monitoring must be maintained throughout. If obstacle avoidance malfunctions, immediately trigger emergency braking to prevent collision damage.
6	During autonomous cruising, it is necessary to pay special attention to fast-moving vehicles, two-wheelers, etc., to avoid collisions.
7	Before mapping and cruising, please ensure the battery is fully charged
8	Please choose a period with sufficient illumination and clear weather for mapping and autonomous cruising to obtain optimal perception feedback and positioning results
9	During mapping and cruising, it is recommended to use in scenarios with relatively abundant feature points, and avoid passing through special scenarios such as long corridors and glass as much as possible.
10	Due to the limitations of the performance characteristics of the current software version, the map loading and positioning initialization process may take a relatively long time. Please follow the subsequent update plan.
11	During dynamic cruising of the robotic dog, it is necessary to avoid large-scale obstruction of the front and rear LiDAR field of view by obstacles, as this can easily lead to localization loss.

4.1 Network Configuration

Connect to the robot dog's Wi-Fi hotspot (starting with M1), click the settings button in the lower right corner, select "Medium Dog" as the model. The default is "Small Dog". After making the selection, close the app and restart the app.



Enter remote control to check if the puppy can have a video stream and if it can move forward, backward, left, and right normally.



4.2 APP Usage Instructions

※ This operating guide is designed to lead you through the core functions and usage processes of the APP. As the product is in continuous iteration, some interfaces and functions may be optimized and adjusted. Please refer to the final interface and functions of the product you actually receive. For the best experience, it is recommended to use Xiaomi Pad 7 and Android phones for operation.

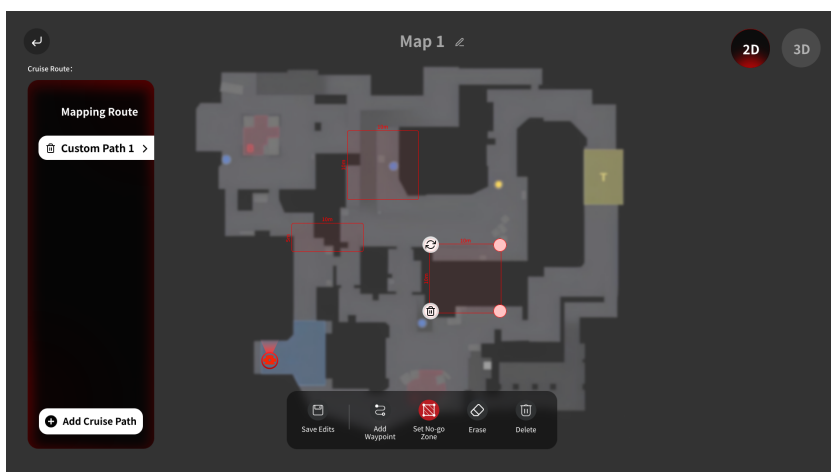
4.2.1 Product Introduction

This APP is a dedicated control terminal for the navigation function of the robotic dog, providing users with whole-link autonomous navigation control capabilities from map building, task planning, map management, to real-time monitoring.

Introduction to the functions of the core area

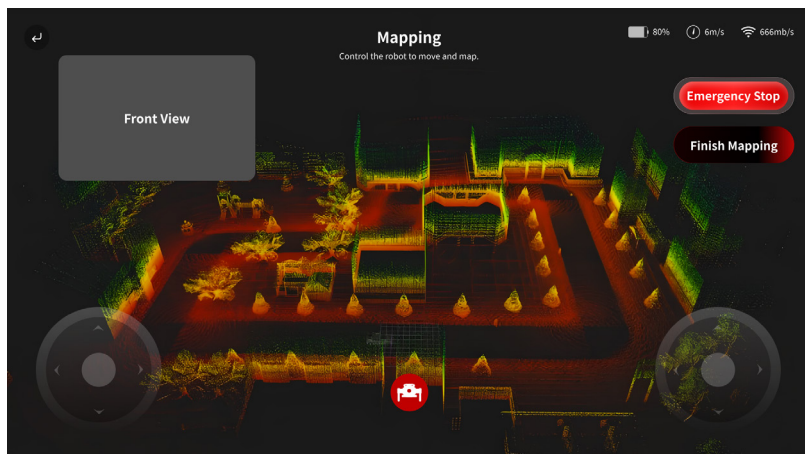
A.Map Display Area

The core area of the APP. During mapping, it displays the 3D point cloud in real time. After mapping is completed, it can generate a 2D map, which can be edited. During cruising, it displays the position and driving trajectory of the robotic dog in real time and tracks the status in real time.



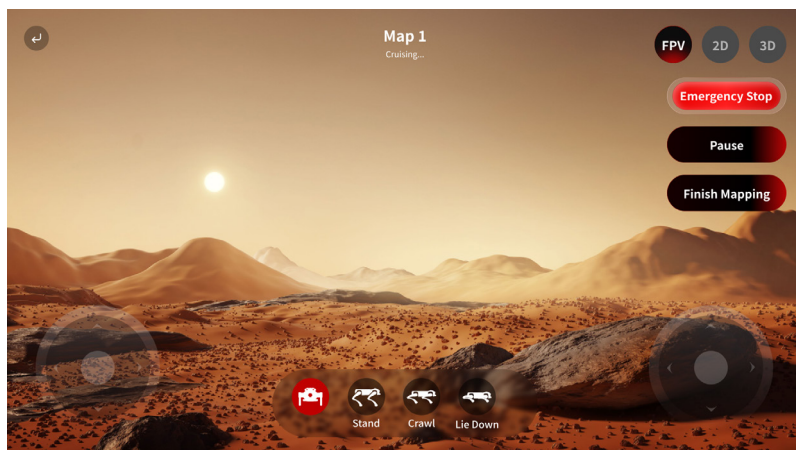
B.Real-time video window

It can float above the map, displaying the real-time image in front of the robotic dog for first-person perspective monitoring. Meanwhile, during operation, the real-scene image fills the screen, allowing real-time viewing of the robotic dog's movement.



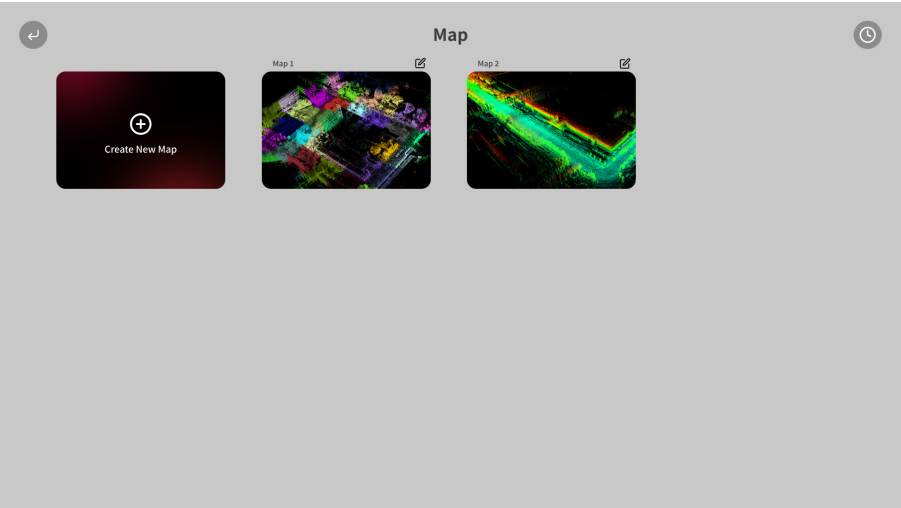
C.Core Control Area

Located at the bottom or right side of the interface, it aggregates controls/function buttons for high-frequency operations across all scenarios, including key buttons such as virtual joystick, mode switch, emergency stop, pause, and start/end cruise, aiming to ensure that users can have a smooth and coherent interactive experience in various tasks such as mapping, cruising, and manual control.



D.Map Management

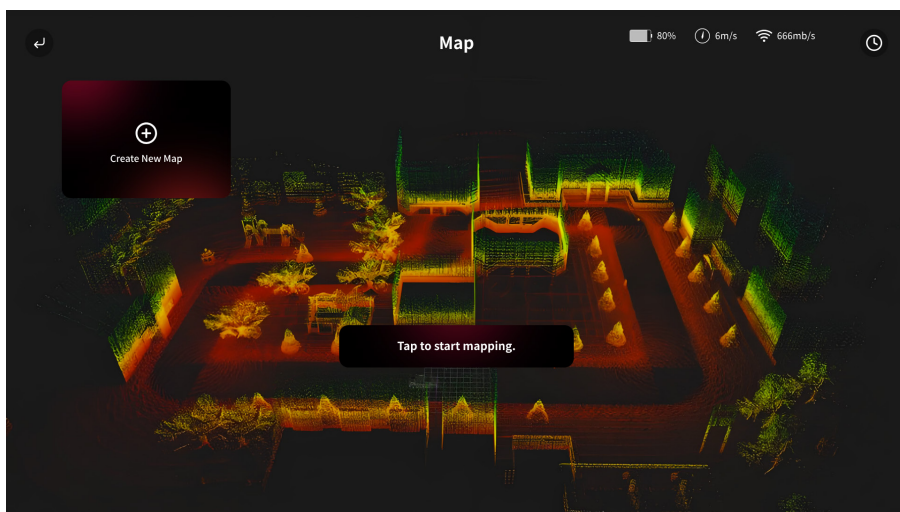
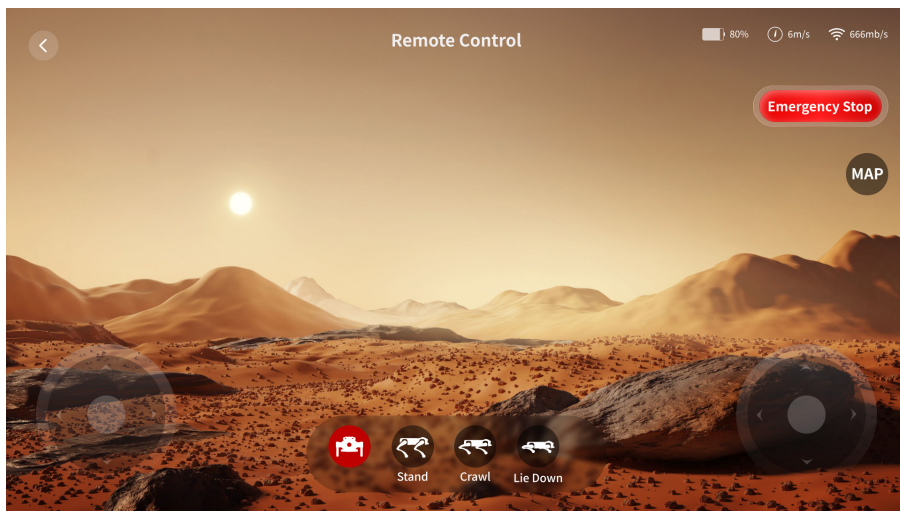
Divided into map management and map editing. In map management, maps can be deleted and named; in map editing, no-fly zone fences can be set for the map, and custom paths can be used to set cruising points, ensuring flexible task arrangement for users.



4.2.2 Operation Instructions

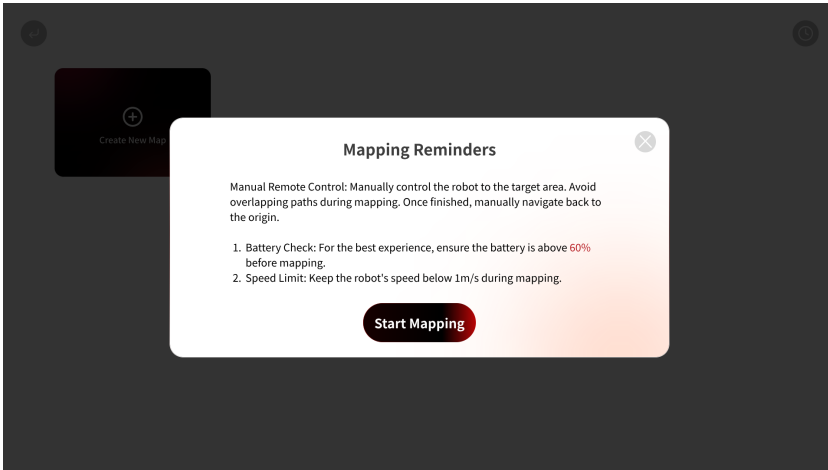
Mapping

- Entry : On the control page, click [MAP] to enter the map management page, then click [New Map] to start map building.

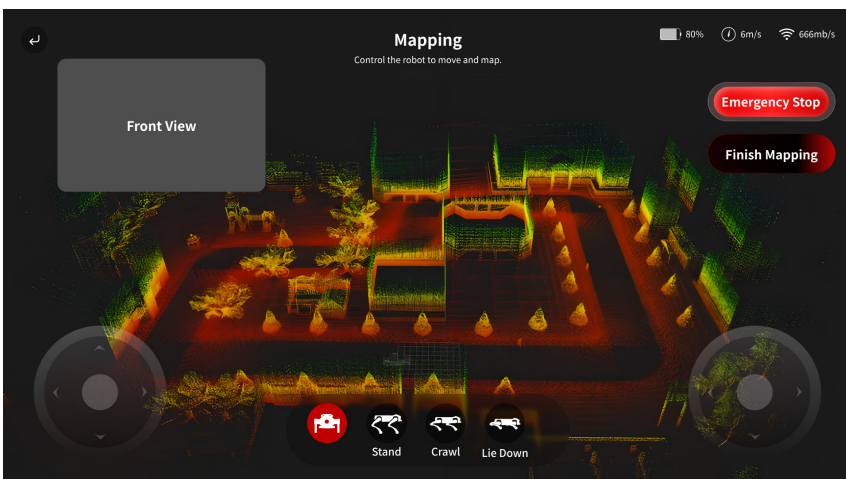


- Process

A) **Start Mapping Page:** When the power and mapping conditions are met, after creating a new map, you can click [Start Mapping].



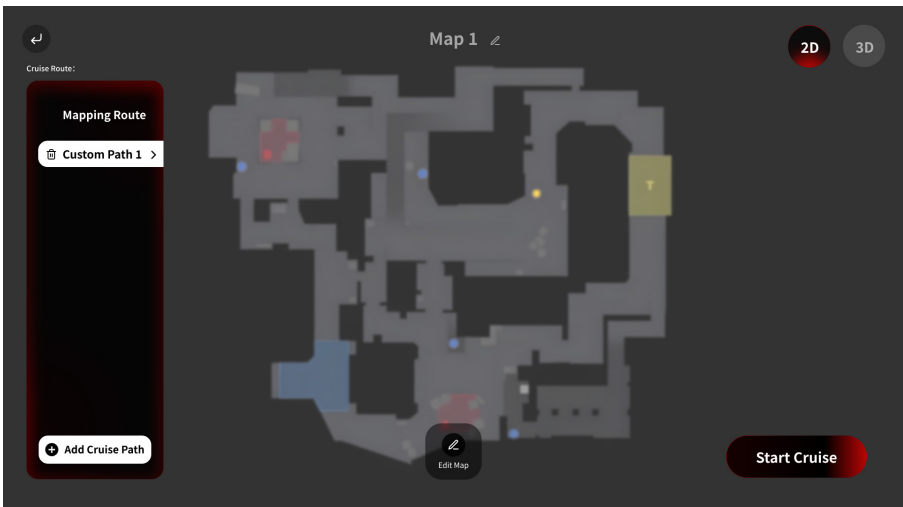
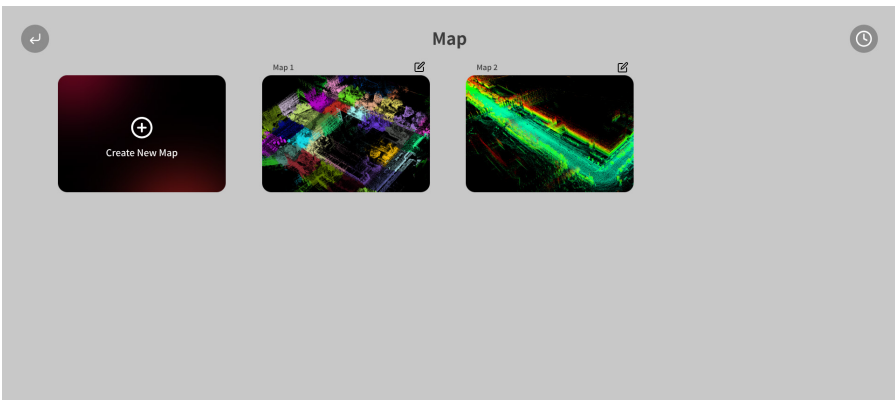
B) **Mapping Process Page:** During mapping, you need to control the 【Control Buttons】 to perform mapping; during mapping, you can switch the actions of the robotic dog, and in case of an emergency, you can click 【Emergency Stop】. The perception effect of the 3D point cloud and the real-scene display of the robotic dog are shown in real time on the screen.



C) End Mapping Page: On the mapping page, after clicking [End Mapping], the map will be saved. Once the save is successful, you can edit the map or execute a cruise mission along the mapping route.

Map Editing

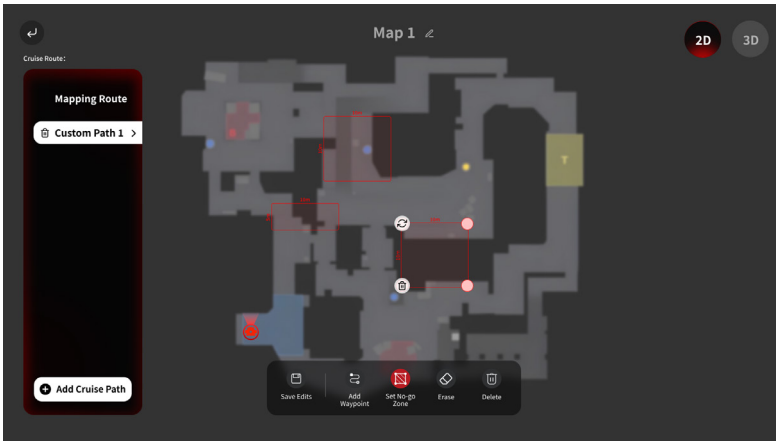
- **Entry :** In the Map Management page, click [Built Maps], then perform [Edit Map] on the map



- Core editing features

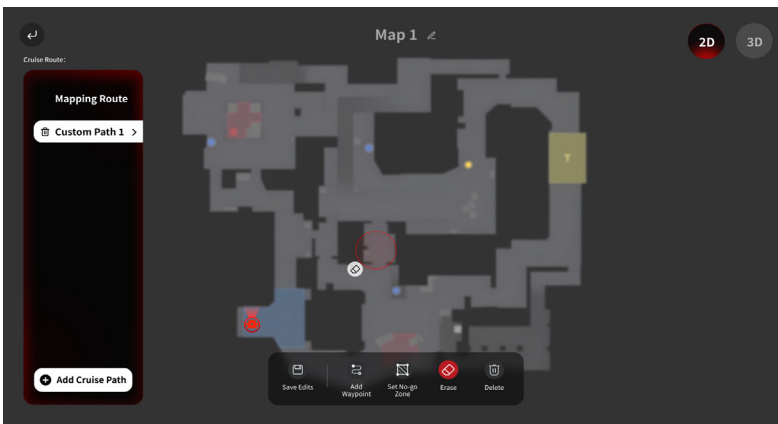
A) Set restricted area

- a) Click [Set Forbidden Zone] to edit the no-go areas on the map.
- b) The restricted area graphic supports adjustments such as scaling, rotation, movement, and deletion.



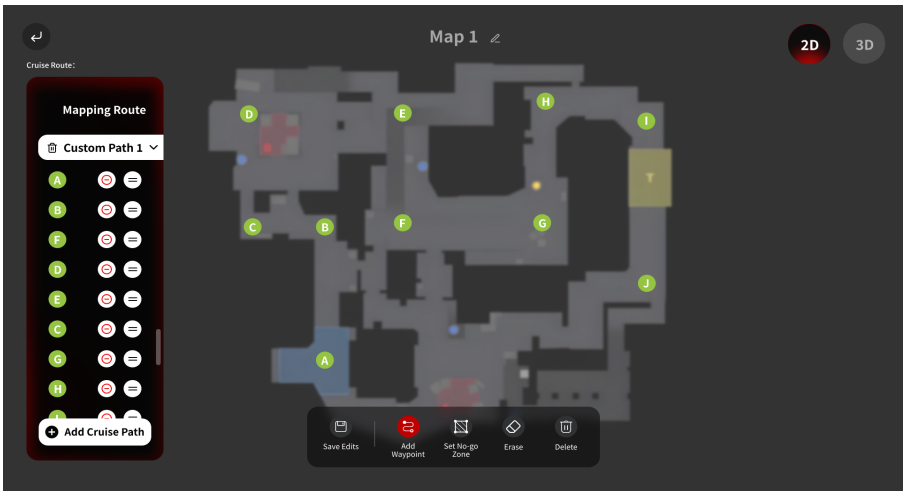
B) Erase

- a) Click [Erase] to erase some noise points on the map. Do not erase obstacles during the erasure process.
- b) Erased graphics support adjustments such as scaling, rotation, movement, and deletion.



C) Add Cruise Point

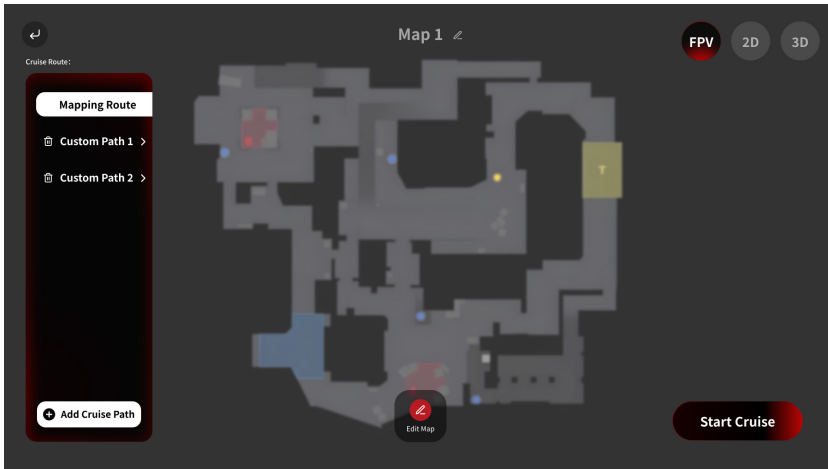
- a) Click **【Add Cruise Point】** to set a series of cruise points on the map to schedule an automatic cruise mission.
- b) You can adjust the order, delete, and long press to set the orientation of the robotic dog when it arrives at the cruising point.
- c) After saving the edits, the robotic dog can execute the cruise according to this customized path.



! **Note:** During the process of editing the map, operations must be performed on the 2D map, and the edited content must not exceed the map area.

Cruise

- **Entrance:** In the route list, click on [Mapping Route] or [Custom Route] to select it, and then you can start cruising.



- **Process**

A) **Start Cruise Page:** After clicking [Start Cruise], it will detect positioning and path planning. Upon success, the robotic dog will start cruising.



B) Cruise Process Page: During the cruise, click [Pause] to temporarily pause the cruise, click [Continue] to resume execution, and if you need to terminate the task, click [End Cruise]. The screen displays in real time the cruise path and the execution status of the cruise points.



C) End Cruise Page: During the cruise, click [End Cruise] or automatically end the cruise when reaching the destination. After the cruise is completed, the interface will fully display the path of this cruise. If the robotic dog is not at the starting point when ending, click the [Return] button, and the robotic dog will automatically cruise back to the starting point.



05 Secondary Development Instructions

※ Please contact technical support.

06 Software Upgrade Operation

※ Please contact technical support.

07 Troubleshooting

Frequently Asked Questions	Handling Measures
When building a map, it prompts that the current state does not allow map building	Restart NX