

涵涡智航科技控导系统使用说明书

HANVO Flight Control and Navigation System Manual

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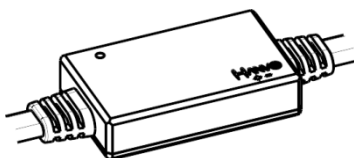
目录 Catalogue

1. 产品配件清单 (PRODUCT SPARE PARTS LIST)	3
2. 接线说明 (CONNECTION ILLUSTRATION)	5
2.1 系统模块接口说明 (MODULE I/O ILLUSTRATION).....	5
3. 系统模块安装说明 (ILLUSTRATION OF SYSTEM MODULES INSTALLATION)	10
3.1 电源模块安装 (POWER MODULE INSTALLATION)	10
3.2 飞控及导航系统安装 (C1&N1 MODULE INSTALLATION)	10
4. 产品规格 (PRODUCT SPECIFICATION).....	11

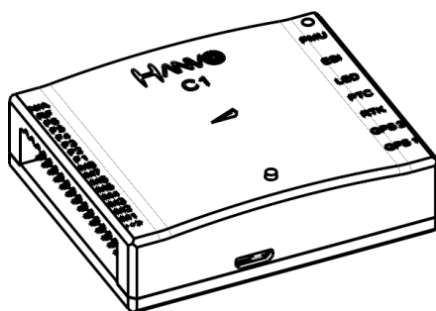
1. 产品配件清单（Product Spare Parts List）

飞行控制模块×1、导航模块×1、电源模块（双输出）×1、HBus 连接线×1、USB 数据线×1；（Flight control module x1、Navigation module x1、Power module x1（input and output）、HBUS cable x1、USB cable x1）

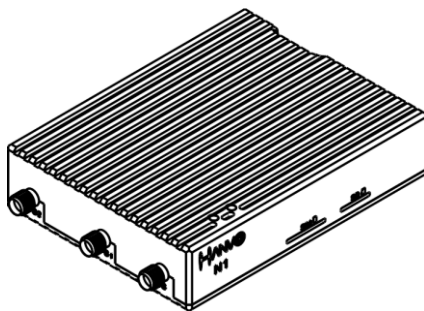
主要配件图示（Main Spare Parts）：



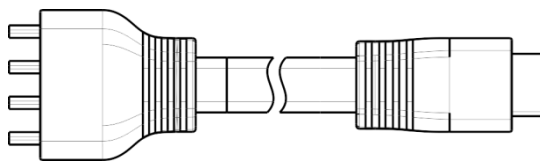
电源模块（Power Module）



飞行控制模块 C1 (Flight Control Module C1)



飞行导航模块 N1 (Navigation Module N1)



HBUS 连接线 (HBUS cable)

2. 接线说明 (Connection Illustration)

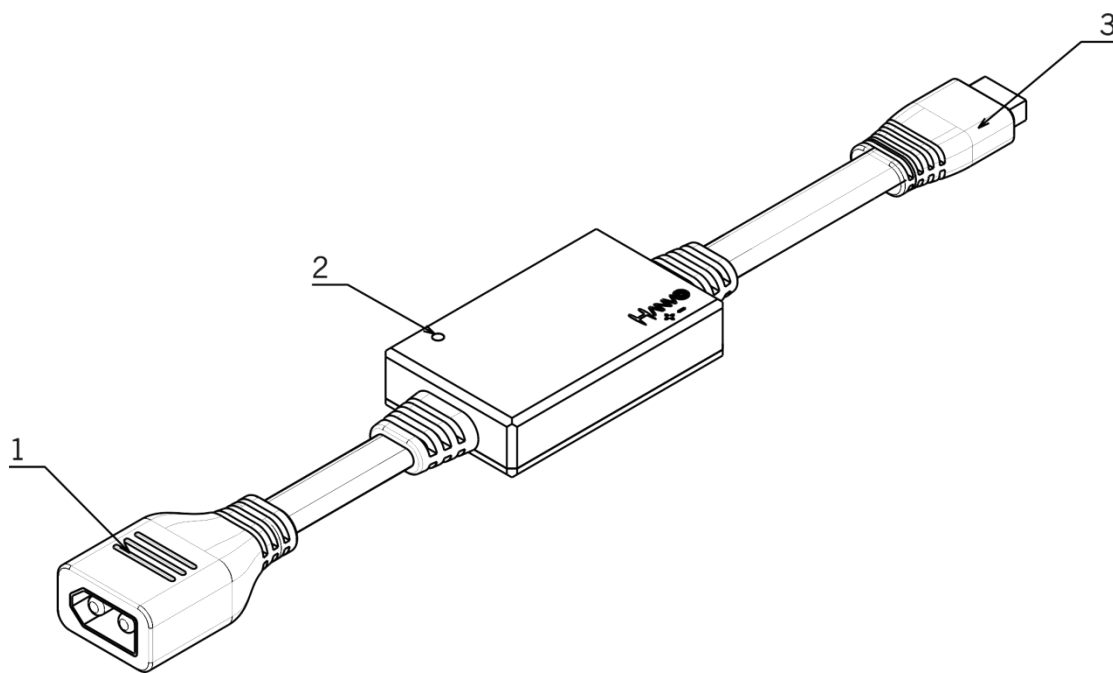
2.1 系统模块接口说明 (Module I/O Illustration)

1. 系统所包含的模块 (System modules)

- (1). 电源模块 (Power module)
- (2). 飞行控制模块 C1 (Flight control module C1)
- (3). 导航模块 N1 (Navigation module N1)

2. 各模块接口及标识说明 (Module I/O and Characteristics)

(1). 电源模块示意图 (Figure of power module)



(2). 电源模块接口及标识说明 (Power module and Characteristics)

1——电池电源输入接口，接 3S-12S 锂电池，电压范围：11V-54V

Battery power input, connected to 3S-12S LiPo Battery, voltage range: 11V-54V

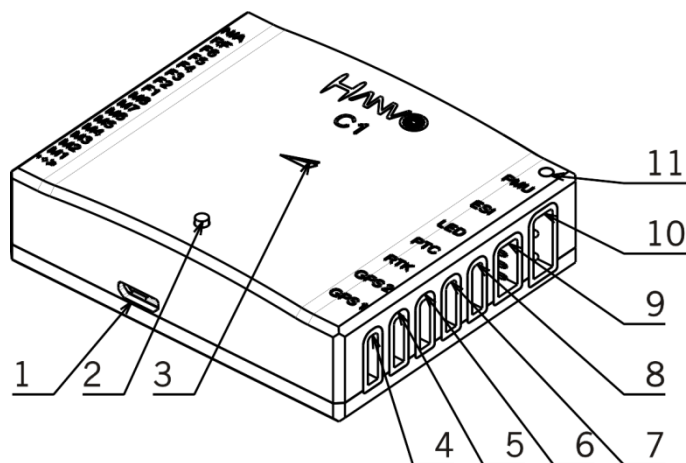
2——电源模块电源指示灯

Power module LED

3——电源输出接口：7V-8V，8A

Power output: 7V-8V, 8A

(3). 飞行控制模块 C1 示意图 (Figure of flight control module C1)



(4). 飞行控制模块接口及标识说明 (Flight control module I/O and characteristics)

1——固件下载 USB 接口

USB I/O for firmware installation

2——BOOT 键，配合固件下载 USB 接口使用

Boot button used with USB for firmware installation

3——机头正方向标识，箭头所指方向为机头

Arrow shows the direction of aircraft head

4——GPS 定位模块接口 1

GPS module I/O 1

5——GPS 定位模块接口 2

GPS module I/O 2

6——RTK 差分定位数据接口，与导航模块数据交互

RTK I/O connected to navigation module

7——PTC 数据通信协议接口，与导航模块数据交互

PTC protocol I/O connected to navigation module

8——LED 指示灯接口

LED I/O

9——ESI 扩展 SPI 接口

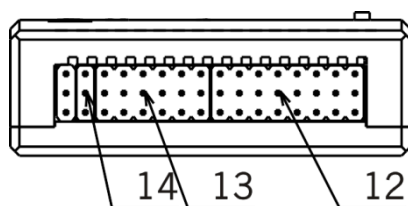
Extension I/O for SPI

10——电源输入接口: 7V-8V, 3A

Power input : 7V-8V, 3A

11——飞行控制模块电源指示灯

Power LED of flight control module



12——M1-M8, 8 通道 PWM 输出接口

M1-M8, 8 PWM channel output I/O

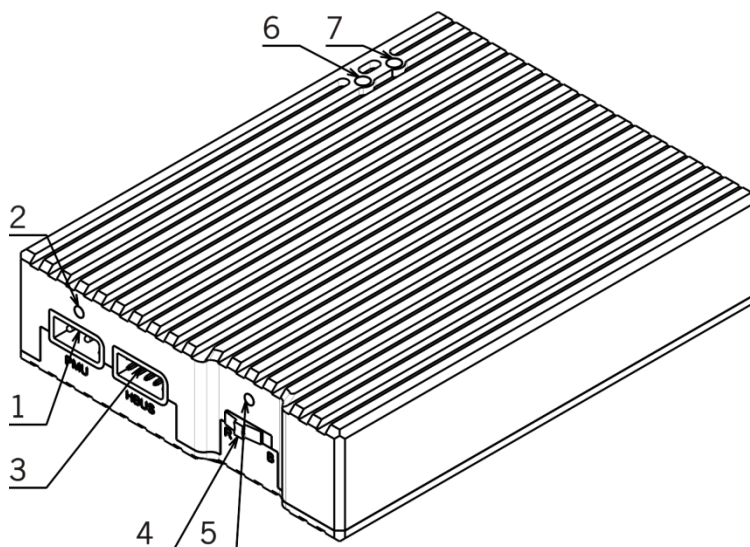
13——F1-F6, 6 通道自定义输入输出接口

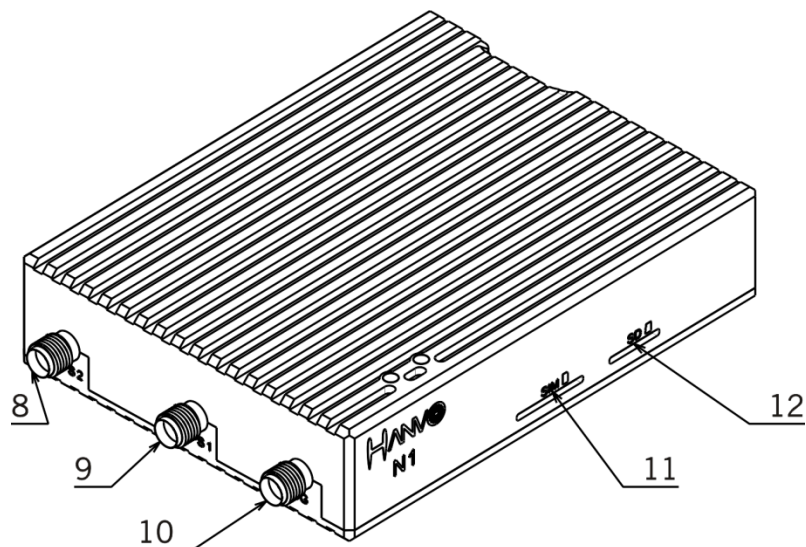
F1-F6, 6 channel I/O for user-defined

14——接收机输入接口

Remote controller receiver I/O

(5). 导航模块 N1 示意图 (Figure of navigation module N1)





(6). 导航模块接口及标识说明 (Navigation module I/O and characteristics)

1——电源输入接口, 7V-8V, 5A

Power input I/O, 7V-8V, 5A

2——导航模块电源指示灯

Power LED of navigation module

3——HBUS, 导航模块总线接口, 与飞行控制数据交互

HBUS interface I/O between navigation module and flight control module

4——基站/移动站模式切换开关

RTK mode switch

5——基站/移动站指示灯

RTK mode LED

6——蓝牙+4G 连接状态指示灯

Blue tooth + 4G status LED

7——导航模块启动状态指示灯

Navigation module status LED

8——GPS2 天线接口

GPS2 antenna I/O

9——GPS1 天线接口

GPS1 antenna I/O

10——4G 天线接口

4G antenna I/O

11——SIM 卡插口

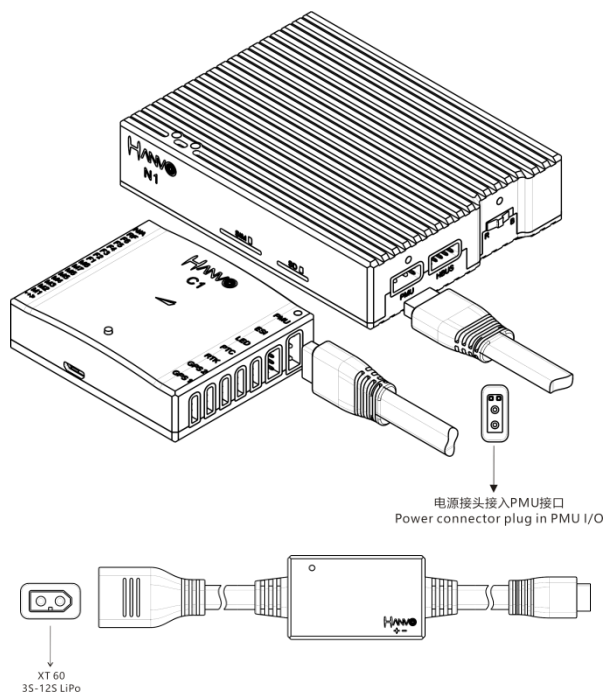
SIM card slot

12——Micro-SD 卡接口

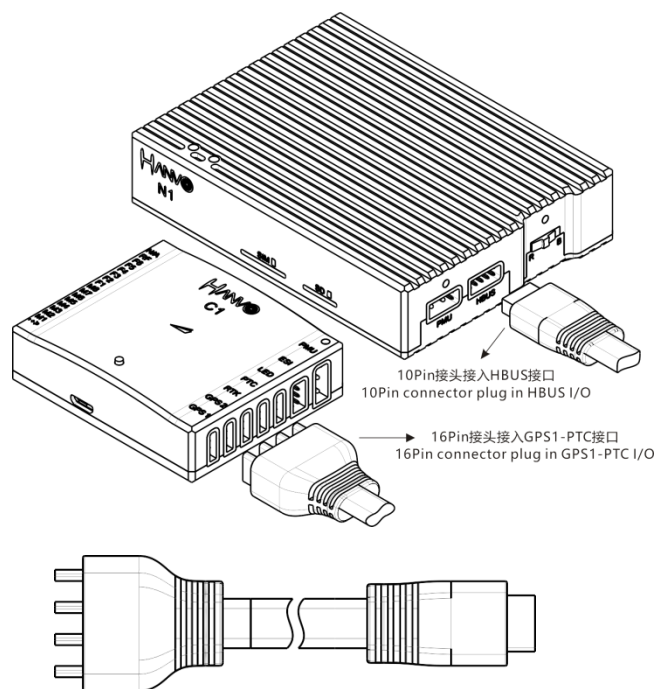
Micro-SD card slot

3. 系统模块安装说明（Illustration of System Modules Installation）

3.1 电源模块安装（Power Module Installation）



3.2 飞控及导航系统安装（C1&N1 Module Installation）



*连接时注意倒圆角方向为向上

*Note that the fillet direction is upward when connecting

4. 产品规格 (Product Specification)

控导系统物理特性	
(C1/N1 Characteristics)	
输入电压 (Voltage Input-Output)	飞控模块: 7.4V (工作电压范围: 7V-8V) C1 module: 7.4V (Voltage range: 7V-8V) 导航模块: 7.4V (工作电压范围: 7V-8V) N1 module: 7.4V (Voltage range: 7V-8V) 电源管理模块: 3S-12S 锂电池供电 (工作电压范围: 11V-54V) Power module: 3S-12S LiPo Battery input (Voltage range: 11V-54V)
功耗: (Power Consumption)	飞控模块: 14.8W (2A@7.4V). C1 module: 14.8W (2A@7.4V). 导航模块: 37W (5A@7.4V). N1 module: 37W (5A@7.4V). 电源管理模块: 60W (8A@7.4V). Power module: 60W (8A@7.4V).
正常工作温度范围: (Normal Temperature Range)	三个模块的工作温度范围均为 -25° — 85° All of modules temperature range: -25° — 85°
重量: (Weight)	飞控模块: 66g. C1 module: 66g 导航模块: 166g. N1 module: 166g
部件尺寸: (Module Size)	电源管理模块: 25g. Power module: 25g 飞控模块: 62.7mm*52.8mm*17.9mm. C1 module: 62.7mm*52.8mm*17.9mm. 导航模块: 94.5mm*74.5mm*22.1mm. N1 module: 94.5mm*74.5mm*22.1mm.

	电源管理模块: 50.5mm*30.8mm*12.4mm. Power module: 50.5mm*30.8mm*12.4mm
内置主要元器件: (Internal Main Component)	飞控模块: IMU, 气压计和电子磁罗盘. C1 module: IMU, pressure sensor and compass 导航模块: GPS, 蓝牙和 4G. N1 module: GPS, Blue tooth and 4G

FCC Warning

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.

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.

Radiation Exposure Statement

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 and your body.