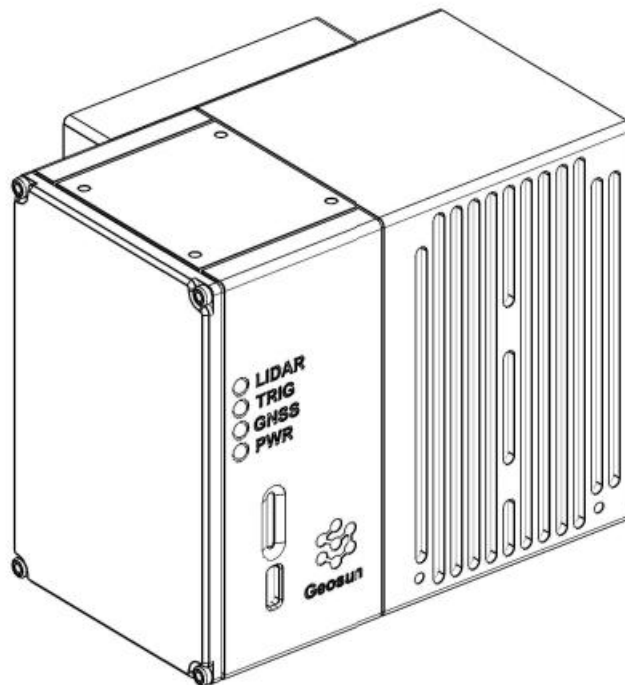




**gAirHawk**



**GS-100M UAV LiDAR Scanning System  
Operation Manual**



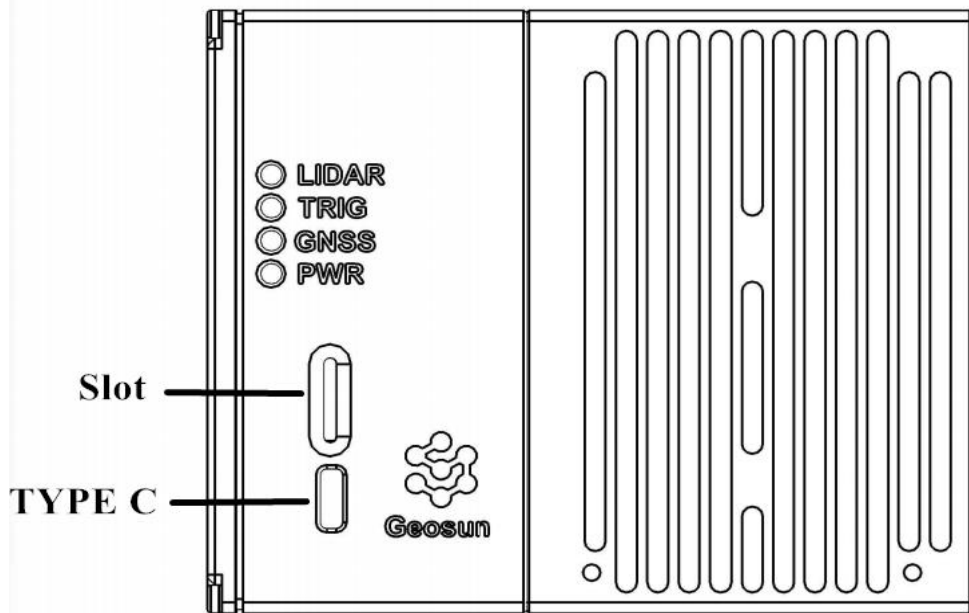
**Wuhan Geosun Navigation Technology Co.,Ltd**

## Introduction

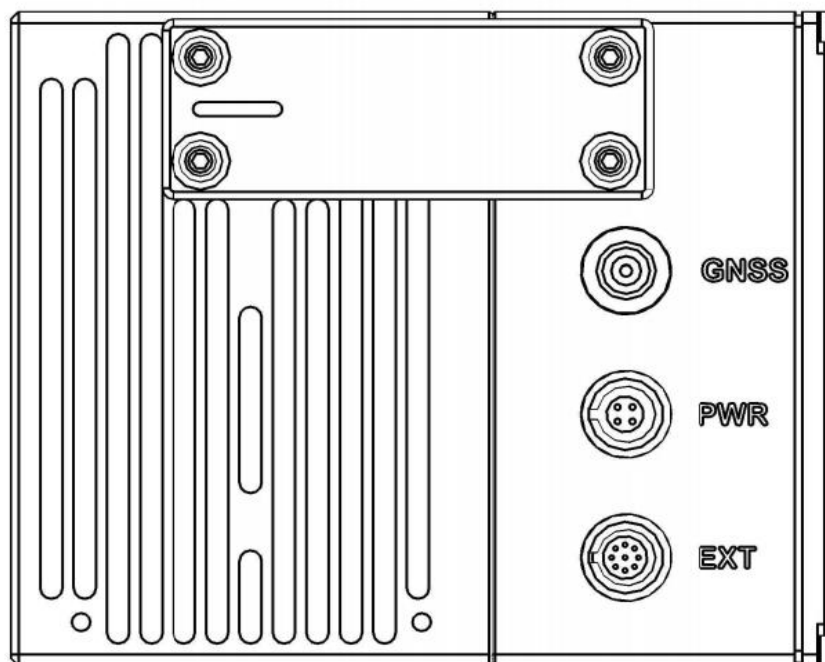
gAirHawk GS-100M is a kind of middle range compact LiDAR point cloud data acquisition system, integrated Livox Avia laser scanner, GNSS and IMU positioning and attitude determination system, and storage control unit, is able to real-time, dynamically, massively collect high-precision point cloud data and rich image information. It is widely used in the acquisition of 3D spatial information in surveying, electricity, forestry, agriculture, land planning

### GS-100M Interface

Interface type	Interface model	Function
GNSS Antenna port	TNC connector	Connected extenal GNSS antenna
Power input port	4 pin aviation connector	Connected the power supply, voltage 12~16V
Data input port	Nine pin core aviation connector	Connected to the laser sensor unit
Signal input port	Nine pin core aviation connector	Event signal, trigger signal, etc
USB port	USD type-C data cable	Copy the data from flash build-in



**GS-100M Side View as Above Figure**



**GS-100M Side View as Above figure**

1 Micro SD slot, 1 Type C interface, 3 interface and 4 LED Indicators

## Standard Operation Flow

GS-100M LiDAR Scanning System Standard Operation Flow as following,

1. Fix the GS-100M lidar scanning system to the carrier (drone or car, etc).
2. Install the GNSS antenna on the carrier without any interference, and connected to GS-100M LiDAR Scanning system directly.

3. Insert the 128GB micro SD card into slot

4. Connect the GNSS antenna to the antenna interface of the GS-100M.

Connect the power cable to the power supply interface(power supply voltage range 12~15V).

5. Turn on the base station (user-supplied) to collect base station data.

Turn on the power of GS-100M, the system starts to run.

**!! Please make sure that the base station starts collecting data one minute ago then turn on the lidar system power!!**

6. Wait for the system to initialize and lock the star, then wait for the led indicator lights in normal. (The power indicator is on, the GNSS indicator flashes one time in 1 intervals, and the LIDAR indicator flashes one time in 1 intervals).

7. After the indicator light is normal, the system needs to stand for 300 seconds to self-calibrate the internal inertial navigation system.

When multiple flights, if the time interval of each flight is short (the time between landing and the next flights are not exceed 5 minutes), the next flights can shorten to 180 seconds.

Some drones have the function of battery replacement without electricity. In this case, after landing, if the LiDAR system is not powered off, there is no need to do a initialization.

8. Start the scanning mission. After taking off, please operate the drone to perform a 8 maneuver, and then enter the flights to start the scanning mission.

This action is used for further calibration of the internal inertial navigation system. If this action is not performed, the accuracy of the data collected during the flight will decrease.

9. After scanning, disconnect the power of the device, take out the data from the micro SD cards, and perform the calculation operation [by Shuttle and gAirhawk software](#) on the computer.

## GS-100M Data Storage Instruction

GS-100M uses one micro SD cards (TF card), respectively used to store POS and LIDAR data.

Each flight, the system will automatically create a folder named as the current point in time, and store all the data collected in this folder directory.

Regarding the micro SD card, please use it according to the following terms:

[1] Please select a micro SD memory card above C10 U1 level.

[2] Approximately 5.5GB of data is generated every 10 minutes when runs LiDAR system (in the triple echo mode). Please make sure that the remaining space in the micro SD card is sufficient for next flights.

[3] When the microSD card is connected to the computer, the computer system will pop up a dialog box prompting that the storage device needs to be scanned. At this time, be sure to select "Scan and Repair", otherwise the data in the micro SD card may not be read and written normally.

GS-100M contains G64GB eMMC (The real capacity is 54 GB) Flash memory

for backing up the collected data to prevent data loss due to accidental damage of the micro SD card.

If users need to read the data in eMMC Flash, please use USB type-C data cable.

(Please make sure that the cable has a data transmission function. Some cables may only have a power function. This type of cable cannot be used.)

Connect the lidar device to the user's computer (the lidar power cable does not need to be connected). The computer will automatically recognize the lidar as a mobile storage device, and then can perform data operations.

When each flight, it will automatically determine the remaining free space in the eMMC flash memory. If the remaining space is less than 20GB, the system will automatically delete the oldest data files until the remaining space is greater than 20GB.

## GS-100M Indicators Instruction

Refer to the 4 led indicators as above mentioned, description as following

PWR Indicator	Light on : Power on Turn off : No power or abnormal Fast flashing: the microSD card is not inserted, or it is inserted but the connection is not good
GNSS Indicator	Light off : Unlock the satellite. 1Hz frequency flashing: the satellite is locked, and internal Flash memory data are saved normally.  Steady light for more than 60s: system is abnormality, please refer to troubleshoot instructions
TRIG Indicator	Light off: no trigger signal output Flash: According to user configuration, it can be set as isochronous trigger or equidistant trigger, flashing when triggered
LIDAR Indicator	Light off: Lidar data is not read Light off: The lidar data are not read 1Hz frequency flashing: Lidar data is normally  Steady light for more than 60s: system is abnormality, please refer to troubleshoot instructions

## GS-100M lidar configuration file

Users can configure some functions of GS-100M

The standard configurable functions currently provided are as follows,

Trigger signal interval: isochronous interval trigger, unit: second and  
equidistant interval trigger, unit: meter

Trigger signal mode: high level trigger (normal low level, high level when  
triggered); low level trigger (normal high level, low level when triggered)

Trigger signal pulse width: 15ms~999ms

The Lidar is configured to be at a 2-second isochronous interval, low-level  
trigger, and pulse width 15ms in default.

If you need to configure other trigger methods, please contact our technical  
support staff. The technical support staff will provide a configure.ini file, put this  
file into the root directory of the micro SD card, then insert the device and  
power on, the device will automatically Read the configuration file and  
complete the configuration.

When the configuration is successfully completed, the configure.ini file in the  
microSD card will disappear after power off.

**!! Do not edit and change the configure.ini file by yourself!!**

**!! Otherwise the device will not work normally!!**



## GS-100M Troubleshoot

An abnormal situation happen when use, please handle it according to this table.

After power on, the power indicator is not on	Please check whether the power polarity is correct and the power connector is connected
Power indicator fast flashing	The micro SD card is not inserted, or it is inserted but the connection is not good
The system start, the GNSS indicator is off for a long time	Please make sure the GNSS antenna, cable and lidar are firmly connected, and the device is in an environment without any interference and the satellite signal is not blocked
LIDAR indicator is off for a long time	The lidar data will be read and stored only after the system completes the locking stars. Please make sure the system locks the star normally. If the LIDAR indicator is still off after more than 5 minutes, please check whether there is slight vibration and sound when running. If there is no such phenomenon, please check the power supply voltage and the current load capacity and make sure the voltage range is 12~15V and there is a current load capacity of 3A or more
The PWR, GNSS and LIDAR indicators are all on	The system is abnormal, please turn off more than 30 seconds, and then connect the power to restart
If you are unable to resolve the anomaly or other abnormal conditions, please contact our technical staffs	