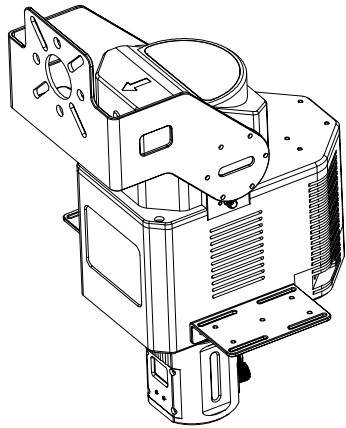
Antenna Tracker Gimbal - G1

User Manual



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Catalogue

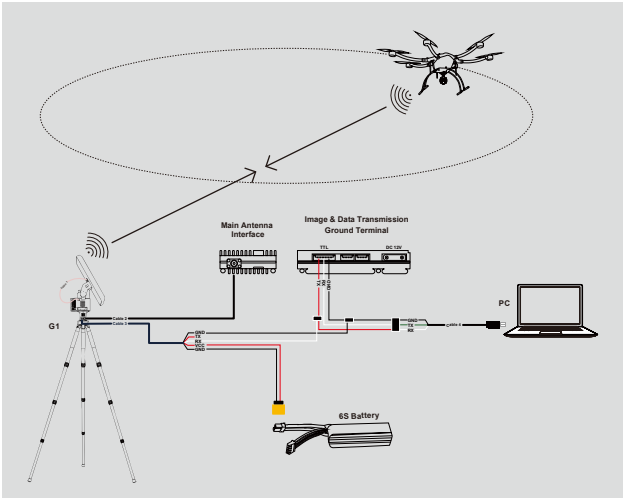
1. Technical Parameters

Pan Rotation Speed	<360°/s
Pitch Rotation Speed	<65°/s
Pan Rotation Angle	Unlimited
Pitch Rotation Angle	-15°~+160°
Operating Voltage	DC12-26V
Working Temperature	-20℃~+60℃
Power Consumption	<15W
Mavlink Protocol Control	PX4/APM Compatible
Battery	Universal Drone Battery (4S~6S)

2. Product Description

2.1 Applications

The G1 Antenna tracker gimbal automatically adjusts the ground antenna direction to maintain the best signal reception, making the connection between the sky and the ground end of the wireless image transmission more reliable.



Note: When the distance between the gimbal and the UAV is less than 10 meters, the gimbal will stop tracking.

2.2 Packing List

Item	Descriptions	Quantity	Picture
Connector	Two-end connector, one end is N-type connector and the other is SMA connector. One end is connected to the antenna, the other end is connected to the tracker RF interface.	2	
Connect Cable 1	The cable is 40cm long, with internal thread and internal pin SMA connectors at both ends. One end is connected to the N-type connector and the other end is connected to the tracker RF port.	1	
Connect Cable 2	he cable is 100cm long, with the internal thread and internal needle SMA connectors at both ends. One end is connected to the N-type connector, and the other end is connected to the main antenna interface of the image transmission RF.	1	
Connect Cable 3	The cable is 150cm long, One end is an aviation plug connected to the tracker communication power interface, and the other end is a power XT60 plug and a 3P DuPont wire connector.	1	

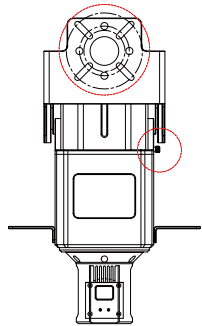
Connect Cable 4	USB TTL Data Cable		
Pallet	Tracker accessory pallet	2	
Tripod	Tracker fixing tripod(optional) Imperial units 1/4 interface	1	
Screws	M3*6 Round head screws	6	

3. Product Diagram

Interface Description

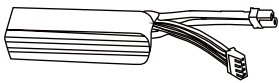
【1】 RF signal access port (SMA)

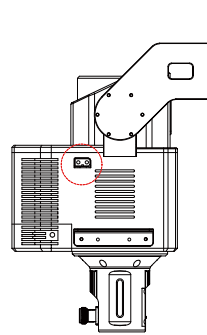
Use the connection cable 1 in the package list to connect the RF cable connector of the directional antenna. The round hole is the fixed installation positiion for the directional antenna, and the oblique slot is the movable installation position.



【2】 Power input interface (XT60)

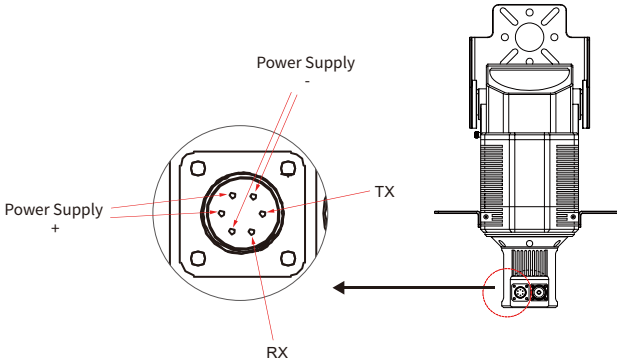
Recommend connecting 6S battery





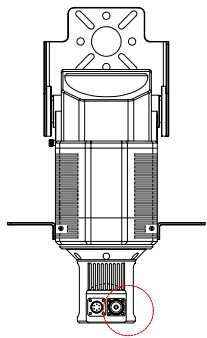
【3】 Aviation plug port (6 pin)

Use the connection cable 3 in the package list, which includes a power input interface (same function as cable 2) and a serial port TTL.



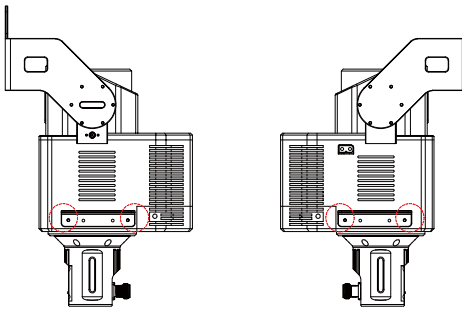
【4】 RF signal output port

Use the connection cable 2 in the package list to connect the RF port of the image transmission or ground station.



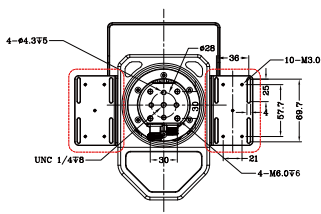
【5】 Holes for mounting the Tray

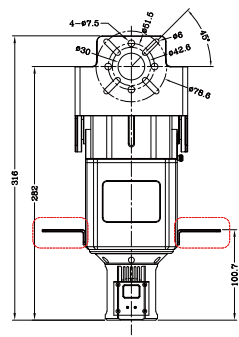
Reserve the M3*6 round-head screws in the packing list to fix the mounting tray. The round hole is a fixed position, and the oblique slot is a movable mounting position.



【6】 Auxiliary tray

The battery can be bundled with Velcro or cable ties.





4. Software Description

4.1 Preparation

Please make sure the tripod is firmly mounted and its legs are tightened. Then turn on the power of the tracker. The magnetic compass starts static calibration.

Under normal circumstances, the tilt angle will return to the horizontal 0 degrees (pointing to the horizon) after the calibration is completed, and the tracker will rotate to the 0 degree north position.

4.2 Button Functions

	Main Interface	Main Menu	Second Menu
Left-click	Turn on/off tracking	Enter the second menu	Select the current item
Left-click and hold	Enter the main menu	Back to the main interface	Back to the main interface
Right-click	HOME Save the current location	Select the next item	Select the next
Right-click and hold	Set the gimbal height*	In vain	Back to main menu

Set the gimbal height*:

When the height positioning of the gimbal is inaccurate, the height can be accurately determined by the height of the UAV: The UAV and the bottom of the tripod are on the same horizontal plane, and the default height of tripod is 1.5M. (Gimbal height =UAV height+1.5M)

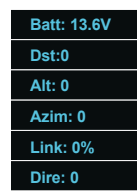
4.3 Main Interface Introduction

After the tracker is powered on and calibrated, the screen displays the main parameters of the current status.

Item	Description
Batt(GPS)	Battery voltage and GPS status will scroll here. Batt:13.6V GPS: 1 means no GPS signal received GPS: 1-64 increasing numbers indicate successful positioning and calibration in progerss GPS: 3D indicates successful positioning
Dst	The distance from UAV to gimbal
Alt	UAV altitude
Azim	UAV heading angle
Link	Mavlink signal reception quality
Dire	Gimbal azimuth

Actual picture:

Pictorial view :



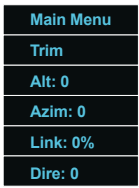
GPS: 1
Dst:0
Alt: 0
Azim: 0
Link: 0%
Dire: 0

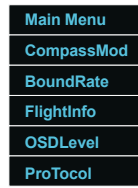
5. Main Menu

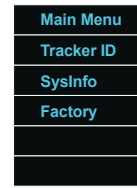
5.1 Menu Bar Options

Item	Description
Trim	Azimuth compensation function
HomePos	Home POS save location function
CalCompass	Magnetic compass calibration function
MotorCurr	Motor current control function
LimPitch	Pitch axis angle limit function
CompassMod	Magnetic compass mode function
BoundRate	Serial port baud rate setting function
FlightInfo	UAV location display function
OSDLevel	Screen brightness setting function
ProTocol	Altitude source setting function
TrackerID	Track gimbal ID

SysInfo	System information function
Factory	Engineering test function







5.2 Trim

Compensation the yaw axis to the left, not saved when the power is off.

Compensation the yaw axis to the right, not saved when the power is off.

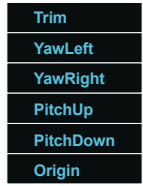
Compensation the yaw axis to the up, not saved when the power is off, click “Origin” to save.

Compensation the yaw axis to the down, not saved when the power is off, click “Origin” to save.

Origin: Save the adjusted pitch axis origin.

When the heading angle of the tracking UAV is inaccurate, you can left-click “Yawleft” or “YawRight” to correct the heading angle to achieve a better tracking effect.

When the initial pitch angle of the tracking gimbal is not in the horizontal position, or there is an error in the pitch angle tracking, you can left-click “PitchUp” or “PitchDown” to correct the horizontal position. Left-click “Origin” if you need to save after adjustment.



5.3 HomePos

H1:xxxxxx: Last saved location.

H2:xxxxxx: Earlier saved location than H1.

H3:xxxxxx: Earlier saved location than H2.

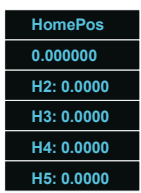
H4:xxxxxx: Earlier saved location than H3.

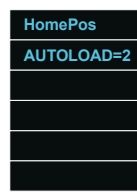
H5:xxxxxx: Earlier saved location than H4.

AUTOLOAD: Turn off or select to use the historical location as the current Home point.

H1-H5: Click the left button to scroll and display the location longitude, latitude, altitude, and the distance between the historical point and the current location.

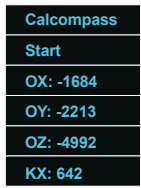
AUTOLOAD: Click the left button,“N”means not turn on, 1-5 means to choose the historical Home as the current location, the setting takes effect immediately, and will not be saved when the power is off.





5.4 Calcompass

Start: Stay away from interference sources before calibration. Left-click to start calibration. The gimbal will make a figure-8 circle during calibration. Calibration is complete when the word “Calibrate” disappears. “OX, OY, OZ, KX, KY, KZ” indicates the magnetic compass compensation data after calibration.

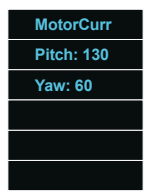


5.5 MotorCurr

Pitch: Left click to modify the current of the pitch axis . And the range is 0-250, the larger the number, the greater the force of the pitch axis.

Yaw: Left click to modify the current of the yaw axis . And the range is 0-250, the larger the number, the greater the force of the yaw axis.

You can choose the current according to actual usage to achieve maximum battery life. This function is saved when the power is off.

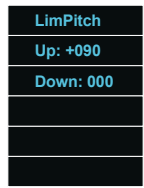


5.6 LimPitch

Up: Left click to control the maximum upward movement angle, range 80°-150°.

Down: Left click to control the minimum downward movement angle, range -15°-30°.

This item is used to adjust the movement range of the pitch axis, 0-90° is recommended. It can be adjusted according to the size of the antenna. Excessive angle may cause damage to the antenna or gimbal.



5.7 CompassMod:

InitOnly: Use the magnetic compass. It will automatically calibrate north function every time power is turned on.

Never: Not use the magnetic compass. This function is used to point the gimbal to the north manually when the environment is highly disturbed and the heading axis cannot point to the north correctly. The gimbal is powered off after selecting this option, and the antenna is manually adjusted to point to the north at 0°. It will initialize after turning the power back on.

5.8 BoundRate

115200

57600

38400

19200

9600

1200

Select the downlink baud rate that matches the data link setting. After the setting, turn the power off and restart to take effect.

BoundRate
115200
57600
38400
19200
9600

5.9 FlightInfo

UAV longitude

UAV latitude

UAV altitude

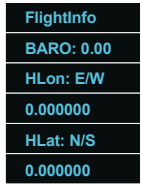
UAV pressure altitude

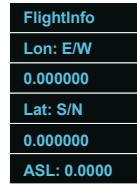
Gimbal longitude

Gimbal latitude

Gimbal altitude

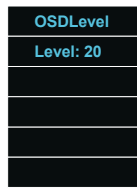
This item displays the current location information of the UAV and gimbal.





5.10 OSDLevel

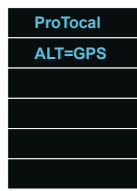
Level: Brightness adjustment 0-100



5.11 ProTocol:

ALT=BARO/GPS, GPS uses Mavlink ID = 30, and the altitude is the calculated altitude.

BARO uses Mavlink ID = 33, and the pressure altitude is the calculated altitude.



5.12 TrackerID

Display the unique ID of the current device.

5.13 SysInfo

VER: V1.01 Sofeware version number

HW: V1.02 Hardware version number

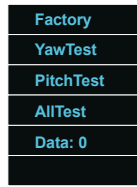
5.14 Factory

YawTest: Left click to turn on or off the yaw axis test. The pitch axis will rotate and move. It is not recommended to install the antenna during the test.

PitchTest: Left click to turn on or off the pitch axis test. The pitch axis will move in a circular motion within the range set by CaliPitch. It is not recommended to install the antenna during the test.

AllTest: Left click to turn on or off the yaw axis pitch axis test. It is not recommended to install the antenna during the test.

Data: When the serial port receives data, the number of bytes will be accumulated. Even if the baud rate is incorrect, the data can be used to determine whether the gimbal hardware has read the external data stream.



6. Mavlink

The MAVLink protocol has been used/implemented in many Flight Controllers, Ground Control Station (GCS) and trackers. Actually different devices use the MAVLink in their own way. One of the reasons is thar MAVLink is not clear enough to define how to send important data such as the data between the UAV and GCS. There are many different MAVLink messages which can be used to send GPS coordinates, altitudes, etc.

The tracker uses the following MAVLink message to obtain position information.

- MAVLINK_MSG_ID_GPS_RAW_INT
- MAVLINK_MSG_ID_ATTITUDE
- MAVLINK_MSG_ID_GLOBAL_POSITION_INT

Use the MAVLINK_MSG_ID_GPS_RAW_INT fields lat, lon, alt to obtain the longitude, latitude and altitude information of the UAV.

Use the MAVLINK_MSG_ID_ATTITUDE field yaw to get the UAV heading angle.

Use the MAVLINK_MSG_ID_GLOBAL_POSITION_INT field relative_alt to get the barometric altitude.

In the Protocol selection,
When ALT=BARO is selected, the MAVLINK_MSG_ID_GLOBAL_POSITION_INT field relative_alt is selected as the altitude data source.
When ALT=GPS is selected, the MAVLINK_MSG_ID_GPS_RAW_INT field alt is selected as the altitude data source.

We recommend users to set the update frequency of the above three messages to a higher frequency to obtain better tracking performance. The setting methods for different flight controllers are different. Taking ArduPilot Mega as an example, you can search the string "SR1_" in the "All Parameters List" of Mission Planner to obtain the MAVLink message update frequency table for the Telemetry1 port.
In this case, please set SR1_POSITION to 5Hz or higher. 0 means disabled.

SR1_EXTRA2	0	Hz	0 10	Stream rate of VFR HUD to ground
SR1_EXTRA3	0	Hz	0 10	Stream rate of AHRS,HWSTATUS
SR1_PARAMS	0	Hz	0 10	Stream rate of PARAM_VALUE to
SR1_POSITION	0	Hz	0 10	Stream rate of GLOBAL_POSITION
SR1_RAW_CTRL	0	Hz	0 10	Stream rate of RC_CHANNELS_SC
SR1_RAW_SENS	0	Hz	0 10	Stream rate of RAW_IMU_SCALED
SR1_RC_CHAN	0	Hz	0 10	Stream rate of SERVO_OUTPUT_R