

# Application Note for HED-10L

Ver: 20240925-01

## 1. Overview

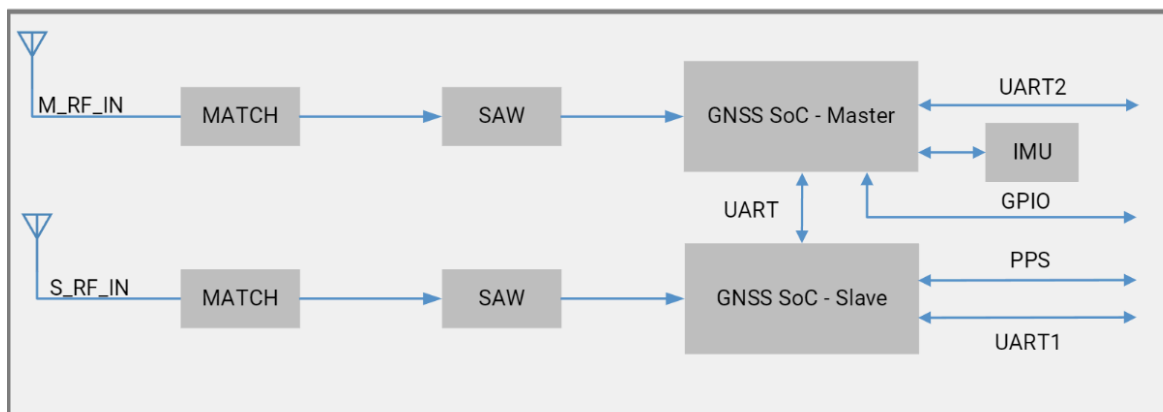
HED-10L is a module support High precision RTK and heading application which based on the state of art CYNOSURE IV dual-core SoC chip. It is capable of tracking all global civil navigation systems (BDS, GPS, GLONASS, Galileo, QZSS, NavIC, and SBAS), as well as BDS-3 signals.

The latest dual-core architecture CYNOSURE IV adopts 22 nm process, with built-in dual-core MCU and 8Mbit MRAM, integrating multi-band multi-system GNSS RF and baseband. This newly designed architecture makes the module achieve sub-meter level position accuracy and higher sensitivity, greater for improved jam resistance and anti-multipath, and provide a highly robust service in complicated environment.

HED-10L support single antenna RTK applications and dual-antenna heading applications. HED-10L integrates with 6-axis IMU chip support output yaw, pitch and roll data.

The size of HED-10L is 16\*21mm, compatible with commonly used Heading modules in the market, and pin-compatible for easy replacement.

HED-10L Blockgram



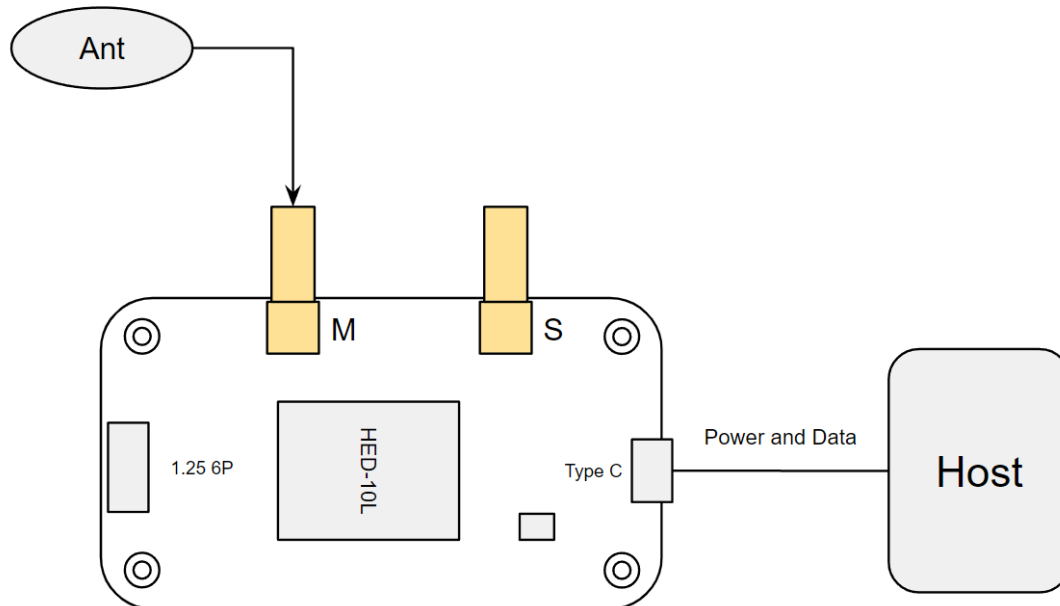
**Note:**

1. The IMU chip does not work in the current fw.
2. EVK will be available in later Oct.

## 2.Applications

### 2.1 RTK

HED-10L support traditional RTK application.



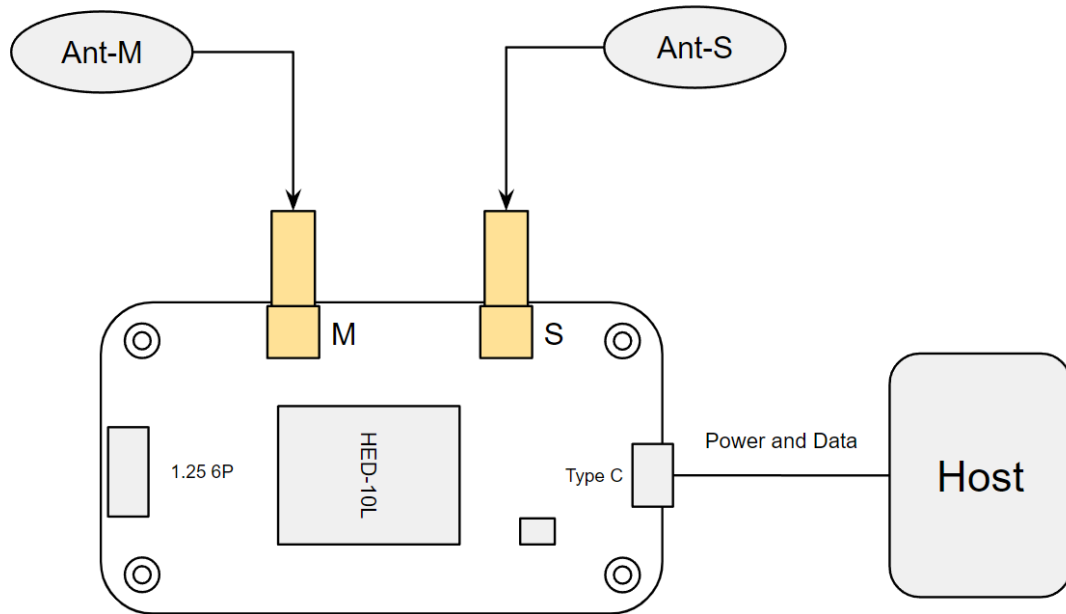
**RTCM input:** from type-c connector

**NMEA output:** from type-c connector, include NMEA sentence

GGA,GSA,GSV,ZDA,RMC,GST

The RTK applications with single antenna is the same with D10P series module.

## 2.2 RTK and Heading



The Heading applications support dual antenna.

HED-10L supports two different usage scenarios for dual antenna.

### 2.2.1 RTK and Heading

For this application, we need feed RTCM data into HED-10L, the module output NMEA include the RTK solution from GGA, GSA,GSV,GST and RMC.

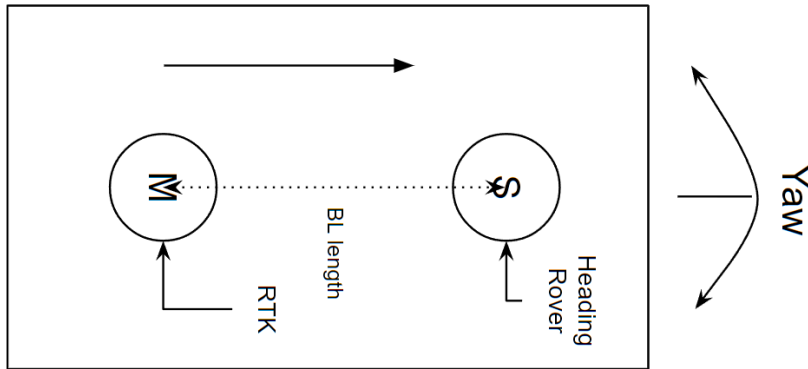
The position and other NMEA data is for Antenna master.

The PALYSBLS sentence is for the heading data.

The following table is the format of PALYSBLS:

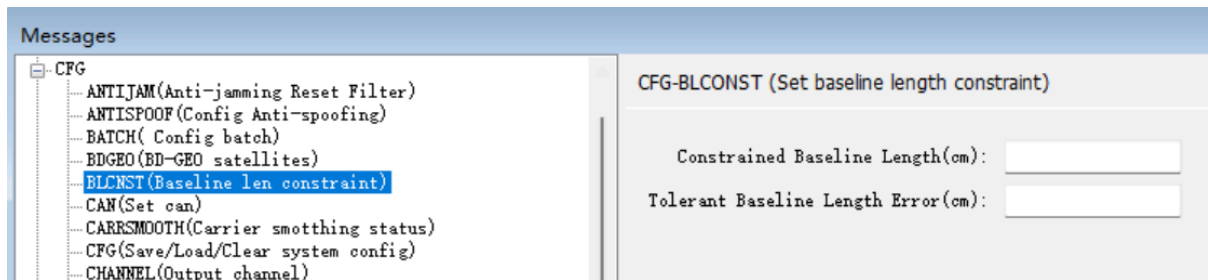
No.	Field	Format
1	\$	Start character (Code 24h)
2	PALYSBLS	Address field
3	hhmmss.s-s	Time of position (heading) fix
4	x.x	Latitude-projection of base-line, m
5		Longitude-projection of base-line, m
6		Height-projection of base-line, m
7		Base-line length (Rover-to-Base distance), m
8		Base-line yaw (angle between base-line vector and North direction), degrees
9		Base-line pitch (angle between base-line vector and horizon), degrees
10	a	Mode Indicator: A = Autonomous mode D = Differential mode F = Float RTK R = Real Time Kinematic E = Estimated (dead reckoning) mode N = Data not valid
11	*hh	Checksum indicator ("**", code 2Ah) and checksum
12	<CR><LF>	End of message indicator (codes 0Dh and 0Ah)

The installation:



the default baseline length is 100cm, with the tolerant 8cm.  
 Setting a relatively accurate baseline length can greatly shorten the initialization time of heading.

**CFG-BLCNST:**



### 2.2.2 Heading

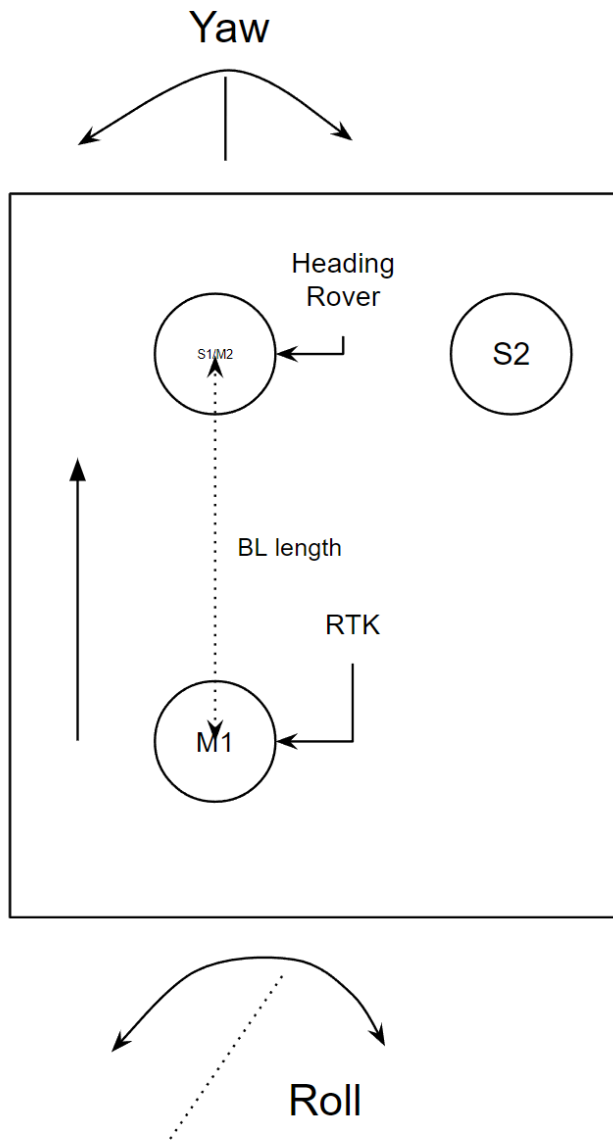
If you just want to get heading data, it is relatively simple.

You only need to install two antennas. In the output NMEA data, the traditional sentences are used to display the current satellite status. You only need to pay attention to the PALYSBLS sentence.

### 2.2.3 Tri-antenna application

If you want to obtain more complete RTK attitude data, we can use a tri-antenna configuration.

This application need two HED-10L.



## 2.3 Others

HED-10L only support L1+L5 dual band.

Baud rate is 230400 in default.