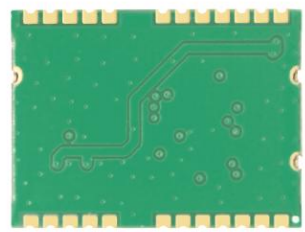
Accurate
positioning
22°43'59.57617"N 114°03'03.61546"E

JS-TP26-2

product specificationsBook



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Change revision history

revision	date	Revision content changes	Comment
V1.0	2022-05-12	Initial Release	Wang Wei
V1.1	2022-05-30	Some parameter corrections	Wang Wei
V1.2	2022-06-07	Add common protocols and command statements	Wang Wei
V1.3	2022-06-29	Modify current parameters	Wang Wei

1 Function description

1.1Overview

JS-TP26-2 adopts multi-mode solution, low power consumption and low cost. It is a multi-mode single frequency (GPS, BDS, GLONASS, Galileo, QZSS and SBAS) positioning module to meet a wide range of applications and terminal products. Developed based on requirements. Based on a high-performance SOC position engine, this receiver provides excellent sensitivity and acquisition time with interference suppression measures to achieve reliable positioning even under difficult signal conditions.

1.2 Product features

- Based on high-performance GNSS SOC series
- capture sensitivityis -148dBm, tracking sensitivity is -165dBm
- Gundam10Navigation update rate in Hz
- Supports GPS, BDS, GLONASS, Galileo, QZSS and SBAS
- Support A-GNSS
- Indoor and outdoor multipath detection and compensation
- Integrated 12 multi-tone active interference cancellers
- Integrated TCXO, SAW and RTC
- tight sizeMinato (16.0mm x12.2mm x2.4mm±0.3mm), suitable for space-sensitive applications
- Support standard NMEA 0183 V3.01/V4.10
- Support 1PPS output

1.3 Performance

parameter	Specification
Constellation frequency point	■GPS/QZSS L1C L1C/A ■GLONASS L1■BDS B1I B1C ■Galileo E1■SBAS WAAS/EGNOS/MSAS/GAGAN
Sensitivity	Tracking sensitivity -165dBm Capture sensitivity -148dBm
First positioning time 1	Cold start 24s Hot start 1s
GNSS positioning accuracy[2]	Level 2m Vertical 3.75m
Time pulse signal accuracy	1PPS 10ns
Speed accuracy 3	GNSS 0.1m/s SBAS 0.05m/s
Operation limit 4	Acceleration 4g Altitude 10000m Speed limit 100m/s
Time pulse signal frequency	1Hz
baud rate	4800-921600bps(Default 115200bps)5
Maximum navigation update rate	10Hz (default is 1Hz)

[1]All satellites are at -130dBm

[2]Open sky, 24 hours stationary, -130dBm, >6SVs, CEP 50%

[3]50%@30m/s dynamic operation

[4]Assuming airborne≤4g platform

[5]To open the debuglog, you need to be able to support a higher baud rate of 230400.bps or above

1.4 Agreement

Protocol	Type
NMEA 0183 V3.01/V4.1	Input/output, ASCII

1.5 antenna

JS-TP26-2 module design can be used with passive and active antennas

Antenna type	Specification
Active antenna recommendations	Minimum gain 15db (compensates for signal loss in RF cables) Maximum gain 30db Maximum noise value 1.5 dB

1.6 Product Application

• Automotive applications • Maritime navigation, fleet management

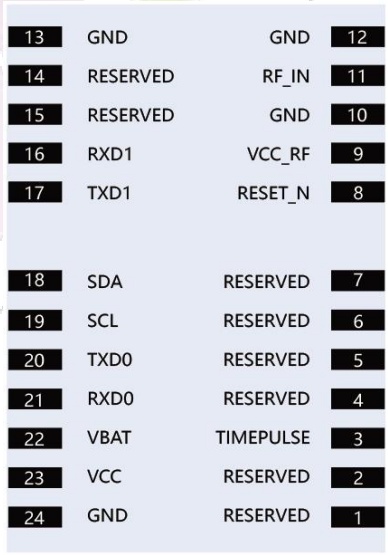
•Intelligent logistics dispatching •Formation drones

•smart robot•Ground vehicle tracking and urban intelligent traffic management

•Emergency lifesaving •Personal travel and wilderness adventure

2 pin definition

2.1 Pin definition



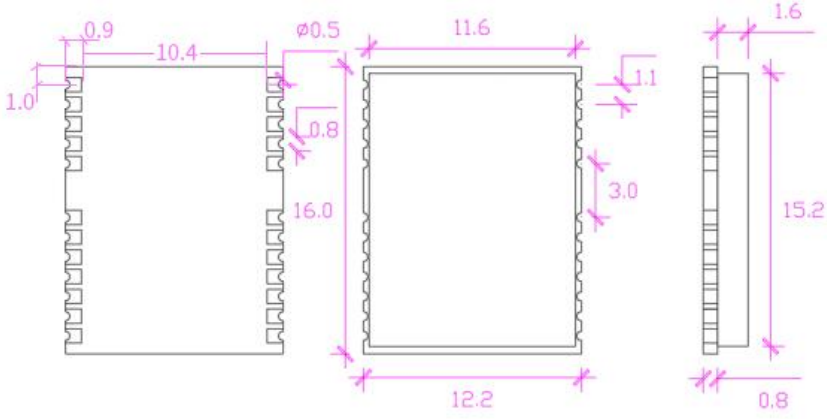
No.	name	I/O	describe
1,2,4,5,6,7,14,15	RESERVED	-	reserved
3	TIMEPULSE	O	1PPS output
8	RESET_N	I	Reset restart (active at low level, stay on when not in use)

9	VCC_RF	P	Antenna power supply (3.3V)
10,12,13,24	GND	G	Ground
11	RF_IN	I	GNSS signal input
16	RXD1	I	null
17	TXD1	O	null
18	SDA	I/O	I2C data
19	SCL	O	I2C clock
20	TXD0	O	UART_TTL data output
21	RXD0	I	UART_TTL data input
22	VBAT	P	Backup power pin (for hot start) (1.62-3.63V)
23	VCC	P	Module main power supply (input)

3 Electrical specifications

Parameter	symbol	smallest	typical	maximum	unit
Voltage	VCC	2.8	3.3	3.6	V
Average supply current	capture	31@3.3V	34@3.3V	38@3.3V	mA
	track	30@3.3V	32@3.3V	35@3.3V	mA
Spare battery			0.07		F
Backup battery current	I_BCKP		11@3.3V		uA
Digital input and output voltage	Div	2.8		3.6	V
Storage temperature	Txt	-40		105	°C
Operating temperature	Topr	-40		85	°C
Humidity				95	%

4 Mechanical specifications

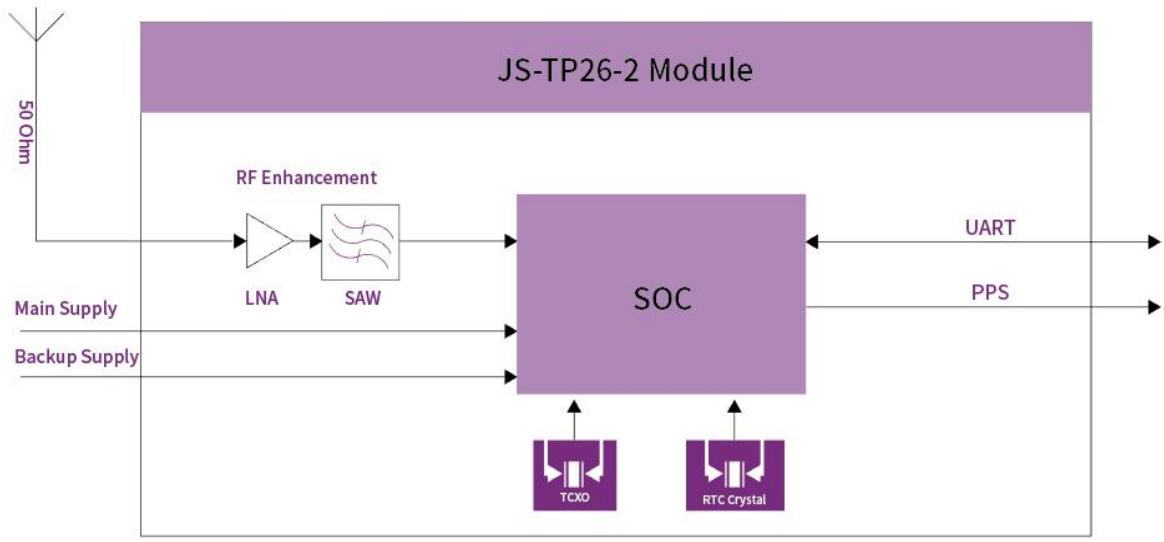


Unit: mm Dimensional error: ±0.3mm

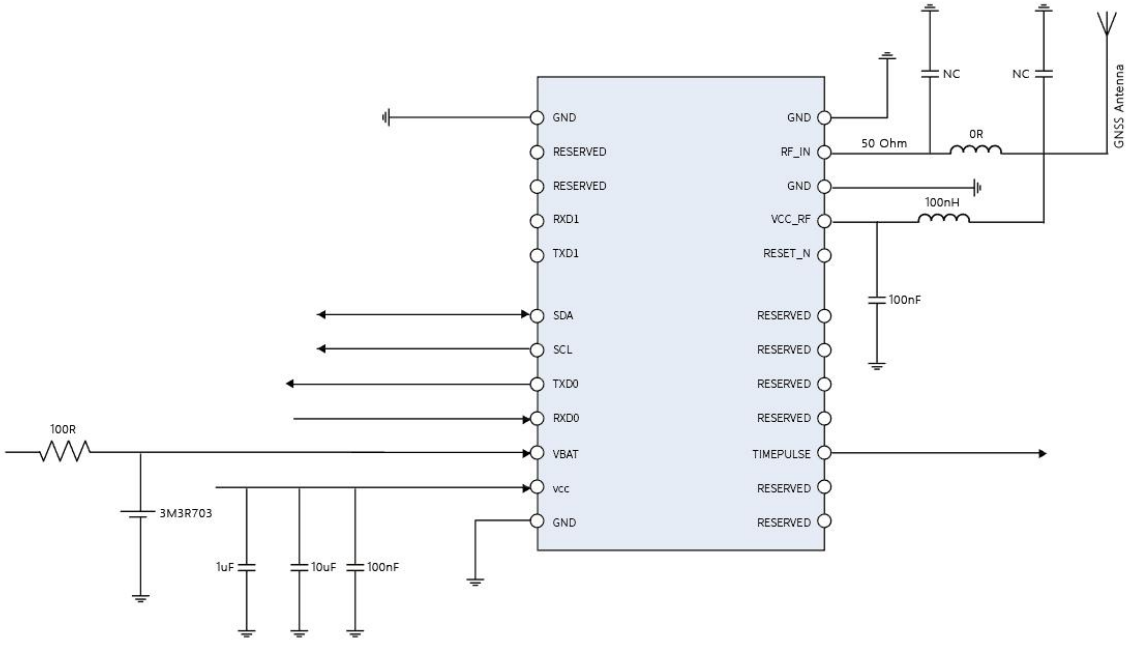
5 Interface configuration selection

5.1 Interface description

5.1.1 Block diagram



5.1.2 Application circuit



6 ROHS

This product complies with RoHS standards

7 Recommended reflow profile

7.1 Note on GNSS module before SMT

7.1.1 When the customer opens the steel mesh, he must make sure that the hole is larger than the GNSS module board. Please open it wider outward according to 1:1 and 0.7 mm, and the thickness is 0.12 mm.

7.1.2 When necessary, you cannot hold the GNSS module with bare hands. You must wear gloves and a static ring.

7.1.3 The furnace temperature depends on the size of the customer's motherboard. Generally, the standard temperature that is attached to the flat plate is 250±5, and it can also be 260±5.

7.2 The following matters should be noted when storing and using GNSS module control:

7.2.1 Storage period: 12 months. Storage conditions: < 40℃. Relative humidity: < 90% relative humidity

7.2.2 After opening the bag, the device that will be subjected to infrared reflux, vapor phase reflux or equivalent processing must be inspected.

7.2.3 Check the humidity card: Store in an environment with relative humidity ≤ 20%. If: 30%~40% (pink) or greater than 40% (red). Label modules are hygroscopic.

7.2.4 Installation within 168 hours under factory conditions: t ≤ 30% ℃, relative humidity ≤ 60%

7.2.5 Once opened, the storage period in the workshop is 168 hours.

7.3 If baking is required, the device can be baked:

7.3.1 The module must remove the moisture problem of the module.

7.3.2 Baking temperature: 125 ℃, 8 hours.

7.3.3 After baking, add an appropriate amount of desiccant and seal the package.

7.4 Actual quantity of module vacuum packaging, this is the actual packaging quantity according to customer requirements.

7.5 Module reel packaging items are as follows.

7.5.1 Storage period: 12 months. Storage conditions: < 40℃. Relative humidity: < 90% relative humidity

7.5.2 After 168 hours after the module is unpacked, the module needs to be baked to remove the hygroscopicity of the module. Baking temperature conditions: 125℃, 8 hours.

7.5.3 The actual quantity of module reel packaging, which is based on the actual packaging quantity required by the customer.

7.6 Module pallet packaging items are as follows:

7.6.1 Storage period: 3 months. Storage conditions: < 40℃. Relative humidity: < 90% relative humidity

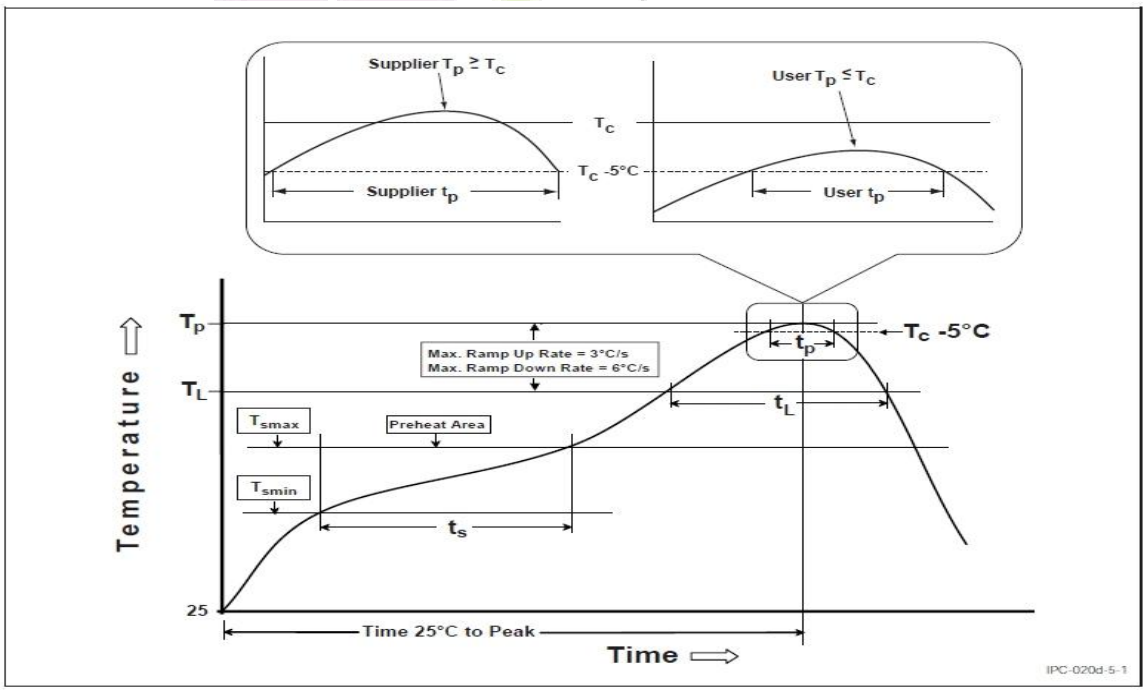
7.6.2 If the module is not used within 48 hours, it needs to be baked before starting. Baking temperature: 125 ℃, 8 hours.

7.6.3 Pallet packaging: 100 pieces per board. Actual quantity of module pallet packaging, this is based on the actual packaging quantity required by the customer.

7.6.4 Lead-free process - classification temperature (Ta)

pack thickness	Volume mm3 <350	Volume mm3 350-2000	Volume mm3 >2000
< 1.6mm	260°C	260°C	260°C
1.6mm-25mm	260°C	250°C	245°C
> 2.5mm	250°C	245°C	245°C

7.6.5Temperature curve



Contour features	Lead-free assembly
Preheat/soak lowest temperature (Tsmin) maximum temperature (Tamax) time t_s($T_{smin}$to T_{smax})	 150℃ 200℃ 60-120 seconds
Rise rate ($T_L$to Tp)	Maximum 3°C/sec
liquidus temperature (T_L) time t_L(The temperature is maintained at $T_L$above time)	217℃ 60-150 seconds
Package body temperature peak (T_p)	Cannot exceed Tc (Tc=260℃)
Duration (t) within specified temperature (Tc) ±5°C_p)✦	30 seconds
Decline rate (Tp to TL)	Maximum 6℃/second
Time from 25°C to peak temperature	up to 8 minutes
✦The tolerance for peak temperature (Tp) is defined as the supplier's minimum value and the user's maximum value.	

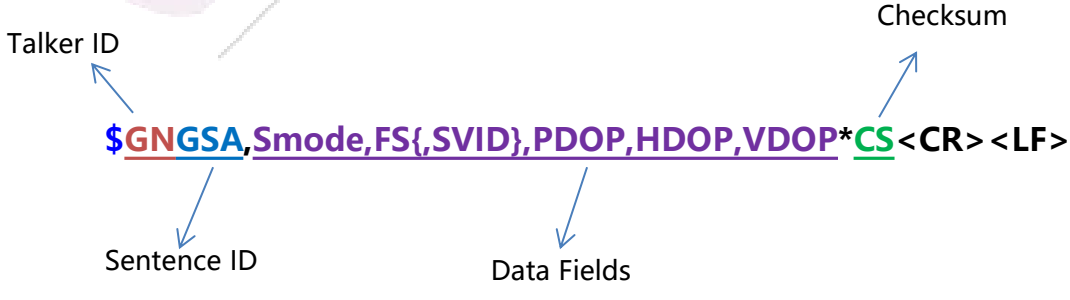
*The time above 255℃ cannot exceed 30 seconds

8NMEA

This module supports National Marine Electronics Association (NMEA) messages based on NMEA 0183 v3.01/v4.10.The following sections show the structure of NMEA protocol messages and the corresponding common standard message formats..

8.1 NMEA protocol

Generally, NMEA messages start with the $ character, followed by the talker ID, sentence ID, data fields and checksum, and then end with '<CR>''<LF>',likeDownAs shown in the picture.



NMEA protocol details

Parameter	String length	Describe
Preamble	1	$
Talker ID	2	Suitable for various GNSS configurations, such as GP/GL/GA/GB/GN
Sentence ID	3	Field description, such as GGA/GSA/GSV/RMC
Data Field	~	A comma symbol must be inserted before each data field to help the decoder process the Data Field
*	1	The asterisk * marks the end of the Data Field
Checksum	2	Checksum of data between preamble and *
CR, LF	2	These two bytes are used to identify the end of the packet

Talker ID description

Talker ID	Describe
GP	GPS
GL	GLONASS
GA	Galileo
GB*	Beidou
GI*	NavIC
GN	Multi-GNSS

* NMEA v3.01/v4.10 does not define Beidou /NavICTalker ID.GB/GI Only defined in NMEA v4.11.

Note: This product does not support NavIC

Sentence IDdescribe

SentenceID	Describe
GGA	Receiver positioning data
GLL	Latitude and longitude, and time location and status
GSA	Factor of Precision (DOP) and Effective Satellite
GSV	Visible satellite information
RMC	Recommended minimum specific GNSS data
VTG	Course over ground and ground speed
ZDA	GNSS date and time

Different GNSS system Talker ID display(for NMEA 0183 v3.01)

Talker ID	GPS only	GLONASS only	Galileo only	Beidou only	NavIC only	Multi-GNSS GPS+GLO+GAL+BDS+NavIC
GGA	GP	GL	GA	GB*	GI*	GN
GLL						
RMC						
VTG						
ZDA						
GSA**						GP+GL+GA+GB+GI
GSV						

Different GNSS system Talker ID display(for NMEA 0183 v4.10)

Talker ID	GPS only	GLONASS only	Galileo only	Beidou only	NavIC only	Multi-GNSS GPS+GLO+GAL+BDS+NavIC
GGA	GP	GL	GA	GB*	GI*	GN
GLL						
RMC						
VTG						
ZDA						
GSA**						
GSV						GP+GL+GA+GB+GI

* NMEA v3.01/v4.10 does not define Beidou/NavIC Talker ID.GB/GI is only defined in NMEA v4.11.

**The difference between Talker ID's NMEA 0183 v3.01 and v4.10 is GSA.

8.2 Standard information

Standard NMEA messages are GGA/GLL/GSA/GSV/RMC/VTG/ZDA.satellite in NMEA statement ID, system ID and signal The definition of ID is as followsDownshown in the table. Below are the details of these messages based on NMEA 0183 v4.10.

8.2.1 GGA

Fixation of time, location and related data.The output position will be affected by the selected datum. The

default data is WGS84.

$--GGA,hhmmss.sss,ddmm.mmmm,a,ddmmm.mmmm,a,x,xx,x.xx,xx,M,xx,M,xx,xxxx*hh<CR><LF>

No.	Format	describe
1	hhmmss.sss	The UTC time of the current location
2	ddmm.mmmm,a	Latitude (degrees and minutes format) - N/S
3	ddmmm.mmmm,a	Longitude (degrees and minutes format) - E/W
4	x	GNSS quality indicators
5	xx	Number of satellites in use, may differ from number seen
6	x.xx	horizontal precision factor
7	xx,M	Altitude mean sea level (geoid), unit: M
8	xx,M	Geoid separation, unit: M
9	xx	Differential GPS data age
10	xxxx	Differential reference station ID, 0000-1023

8.2.2 GLL

Positioning time and positioning status.

$--GLL,ddmm.mmmm,a,ddmmm.mmmm,a,hhmmss.sss,A,a*hh<CR><LF>

No.	Format	describe
1	ddmm.mmmm,a	Latitude (degrees and minutes format) - N/S
2	ddmmm.mmmm,a	Longitude (degrees and minutes format) - E/W
3	hhmmss.sss	The UTC time of the current location
4	A	Status A = data is valid, V = data is invalid
5	a	Positioning status indication. A=autonomous mode, V=estimate mode (dead reckoning), N=invalid, D=differential mode

8.2.3 GSA

Dispersion Factor of Precision (DOP) and effective satellites.

$--GSA,a,x,xx,xx,xx,xx,xx,xx,xx,xx,xx,xx,xx,xx,x.xx,x.xx,x.xx,h*hh<CR ><LF>

No.	Format	Describe
1	a	Mode: M = Manual, forces 2D or 3D mode; A = Automatic, allows automatic 2D/3D switching
2	x	Mode: 1 = not available, 2 = 2D, 3 = 3D
3	xx	Satellite numbers used for positioning. This field displays a total of 12 available satellite numbers. If there are more than 12 satellites, only the first 12 will be output. If there are less than 12, the insufficient area will be filled in (please refer toSatellite ID in NMEA sentences)
4	x.xx	PDOP
5	x.xx	HDOP
6	x.xx	VDOP
7	h	GNSS System ID (1:GPS, 2:GLONASS, 3:Galileo, 4:Beidou, 6:NavIC) (only supports NMEA v4.10 format,refer toSystem, signal ID in NMEA sentences)

8.2.4 GSV

Observed number of GNSS satellites, PRN, elevation angle, azimuth angle and signal-to-noise ratio.

$--GSV,x,x,xx,xx,xx,xxx,xx,……..……..,xx,xx,xxx,xx,h*hh<CR><LF>

No.	Format	describe
1	x	total number of statements
2	x	Current statement number
3	xx	Total number of visible satellites
4	xx	Satellite number
5	xx	Elevation angle, maximum 90°
6	xxx	Azimuth angle, 000 to 359°
7	xx	Signal-to-noise ratio (C/No) 00- 99 dB-Hz, empty when no tracking
8	h	Signal ID (only supports NMEA v4.10 format,refer toSystem, signal ID in NMEA sentences)

8.2.5 RMC

The recommended minimum specific GNSS data is position, SOG, COG and time.

$--RMC,hhmmss.sss,A,ddmm.mmmm,a,ddmmm.mmmm,a,x.xx,x.xx,xxxxxx,xx,a,a,a*hh<CR><LF>

No.	Format	describe
1	hhmmss.sss	The UTC time of the current location
2	A	State A = Autonomous mode, V = Inactive, D = Differential mode
3	ddmm.mmmm,a	Latitude (degrees and minutes format) - N/S
4	ddmmm.mmmm,a	Longitude (degrees and minutes format) - E/W
5	x.xx	Speed over ground, unit: knots
6	x.xx	True heading to ground, unit: degrees
7	xxxxxx	date(ddmmyy)
8	xx,a	Magnetic declination, unit: degrees. Magnetic declination direction: E-east, W-west. Fixed to empty
9	a	Status Bar. A=autonomous mode, V=estimate mode (dead reckoning), N=invalid, D=differential mode
10	a	Navigation status (only supports NMEA v4.10 format)

8.2.6 VTG

Course on Ground (COG) and Speed on Ground (SOG) information.

$--VTG,x.xx,T,x.xx,M,x.xx,N,x.xx,K,a*hh<CR><LF>

No.	Format	describe
1	x.xx	Heading to true north above ground, unit: degrees (000-359°)
2	T	True north indication, fixed to T
3	x.xx	Heading to magnetic north, in degrees (000-359°)
4	M	Magnetic North indication, fixed at M
5	x.xx	Speed over ground, unit: knot (000-999 knot)
6	N	The unit of speed is knots, fixed at N = knots/hour
7	x.xx	Ground speed (000-999 kilometers/hour)
8	K	Speed unit, fixed at K=km/h
9	a	Positioning mode status. A=autonomous mode, V=estimate mode (dead reckoning), N=invalid, D=differential mode

8.2.7 ZDA

GNSS time and date.

$ --ZDA,hhmmss.sss,xx,xx,xxxx,xx,xx*hh<CR><LF>

No.	Format	Describe
1	hhmmss.sss	UTC time, hhmmss (hours, minutes and seconds) format
2	xx	UTC date, 01 to 31
3	xx	UTC date, January to December
4	xxxx	UTC date, year
5	xx	Current time, hour
6	xx	Current time, minutes

Satellite ID in NMEA sentences

Constellation	PRN numbers	Satellite ID (AIROHA)	Satellite ID (NMEA 0183 v4.10)
GPS	1-32	1-32	1-32
SBAS	120-138	33-51	33-64
GLONASS	1-24	65-88	65-99
Galileo	1-36	1-36	1-36
Beidou	1-63	1-63	N/A
QZSS	193-199	193-199	N/A
NavIC	1-14	1-14	N/A

System/Signal ID in NMEA sentence

Constellation	System ID (AIROHA)	Signal ID (AIROHA)	System ID (NMEA 0183 v4.10)	Signal ID (NMEA 0183 v4.10)
GPS L1C/A	1	1	1	1
GPS L5Q	1	8	1	8
GLONASS L1	2	1	2	1
GalileoE1-BC	3	7	3	7
Galileo E5a	3	1	3	1
Beidou B1I	4*	1*		
Beidou B2a	4*	4*		
NavIC L5	6*	1*		

* Beidou/NavIC is not defined in NMEA v4.10

9 Common command switches

Since the check code of each command is different, other configuration commands not given in the following common configurations must pass the check before sending the command before they can be applied.

Comparison table of response results sent by the command		
Data Format	$PAIR001,<Command_ID>,<Result>*CS<CR><LF>	
illustrate	Command_ID: The command/message type is confirmation response	
	Result: The results of command execution 0, 1, 2, 3, 4, 5 are as follows	
●	0	Command issued successfully
●	1	Indicates that the command is being processed and needs to wait for the result.
●	2	Failed to send command
●	3	Indicates that the command ID is not supported
●	4	Command parameter error (out of range/some parameters missing/checksum error)
●	5	MNL server is busy. You can try again soon
Note: The above is the response result of the command. This command is automatically sent by the GNSS system. Do not send directly to GNSS system		
POWER_ON/POWER_OFF		
1	$PAIR002*38\r\n	POWER_ON (please send this command before using any location services)
Send commandbackreturn $PAIR001,002,1*38\r\n ==> The power-on process is running. Please wait $PAIR001,002,0*39\r\n ==> Booted successfully		
2	$PAIR003*39	POWER_OFF (location service is unavailable after executing this command)
Send commandbackreturn $PAIR001,003,1*39\r\n ==> The power-off process is running. Please wait $PAIR001,003,0*38\r\n ==> Shutdown successful		
save command		
1	$PAIR513*3D\r\n	Save current configuration from RTC RAM to flash
Send commandbackreturn $PAIR001,003,1*39\r\n ==>Success		
Note: If the module outputs at multiple Hz, you need to send $PAIR003*39\r\n to make the system POWER_OFF before executing this command. However, there is no such restriction for 1Hz.		
Support constellation configuration		
Data Format	$PAIR066,<GPS_Enabled>,<GLONASS_Enabled>,<Galileo_Enabled>,<BeiDou_Enabled>,<QZSS_Enabled>,<NavIC_Enabled>*CS	
Example	$PAIR066,1,1,1,1,1,0*3B	
illustrate	“0” disable (do not search for satellites); “1” enable (search for satellites)	

	Command (send)	**Output information**	**illustrate**
1	$PAIR066,1,1,1,1,1,0*3B\r\n	GPS+GLONASS+Galileo+BDS+QZSS	L1 frequency supported Constellation combination
2	$PAIR066,1,0,0,0,0,0*3B\r\n	GPS	
3	$PAIR066,1,1,0,0,0,0*3A\r\n	GPS+GLONASS	

4	$PAIR066,1,0,1,0,0,0*3A\r\n	GPS+Galileo	configuration
5	$PAIR066,1,0,0,1,0,0*3A\r\n	GPS+BDS	
Send commandbackreturn $PAIR001,066,0*3B\r\n==> Success			

Turn off NMEA statement command

1	$PAIR062,0,0*3E\r\n	Close GGA statement
2	$PAIR062,1,0*3F\r\n	Close GLL statement
3	$PAIR062,2,0*3C\r\n	Close GSA statement
4	$PAIR062,3,0*3D\r\n	Close GSV statement
5	$PAIR062,4,0*3A\r\n	Close RMC statement
6	$PAIR062,5,0*3B\r\n	Close VTG statement
7	$PAIR062,6,0*38\r\n	Close ZDA statement
Send commandbackreturn $PAIR001,062,0*3F\r\n==> Success		

Open the NMEA statement command

1	$PAIR062,0,1*3F\r\n	Open GGA statement
2	$PAIR062,1,1*3E\r\n	Open GLL statement
3	$PAIR062,2,1*3D\r\n	Open GSA statement
4	$PAIR062,3,1*3C\r\n	Open GSV statement
5	$PAIR062,4,1*3B\r\n	Open RMC statement
6	$PAIR062,5,1*3A\r\n	Open VTG statement
7	$PAIR062,6,1*39\r\n	Open the ZDA statement
Send commandbackreturn $PAIR001,062,0*3F\r\n==> Success		

Set navigation mode

Format	$PAIR080,<CmdType>*CS<CR><LF>	
Example	$PAIR080,1*2F\r\n ==> Enter fitness mode	
1	$PAIR080,0*2E\r\n	Normal mode
2	$PAIR080,1*2F\r\n	Fitness mode (for activities such as running and walking <5m/s)
3	$PAIR080,4*2A\r\n	Still mode (this module is not supported yet)
4	$PAIR080,5*2B\r\n	Drone mode (such as hovering, cruising, etc.)
5	$PAIR080,7*29\r\n	swimming mode
6	$PAIR080,9*27\r\n	Cycling mode (this module is not supported yet)
Send commandbackreturn $PAIR001,080,0*33\r\n==> Success		
Note: If ULP (ultra-low power consumption) is enabled, setting it to non-fitness mode will fail.		

Static drift settings

Format	$PAIR070,<Speed_threshold>*CS<CR><LF>	
1	$PAIR070,0*21\r\n	Static drift is set to 0 dm/s (default)
2	$PAIR070,1*20\r\n	Static drift is set to 1 dm/s
3	$PAIR070,4*25\r\n	Static drift is set to 4 dm/s
4	$PAIR070,10*10\r\n	Static drift is set to 10 dm/s
5	$PAIR070,20*13\r\n	Static drift is set to 20 dm/s
illustrate:<Speed_threshold> is 1 dm/s~20dm/s (1dm/s = 0.1m/s) **Send commandbackreturn** $PAIR001,070,0*3C\r\n==> Success		

Query the static drift speed threshold

1	$PAIR071*3C\r\n	Static drift speed threshold query command

Send commandbackreturn $PAIR001,071,0*3D\r\n==> Success

$PAIR071,0.4*3A\r\n==>The static drift speed threshold is 0.4m/s (the minimum threshold is 0.1m/s, the maximum is 2.0m/s)

Hot and cold start setting instructions

1	$PAIR004*3E\r\n	Hot Start
2	$PAIR005*3F\r\n	Warm start
3	$PAIR006*3C\r\n	Cold start

Statement output frequency setting

Format	$PAIR062,<NMEA type>,<output frequency>*CS<CR><LF>	
Example	$PAIR062,0,3*3D\r\n → Output GGA statement once every 3 seconds	
NMEA type	0=GGA, 1=GLL, 2=GSA, 3=GSV, 4=RMC, 5=VTG, 6=ZDA, 7=GRS, 8=GST	
Output frequency	0=no output, 1=1 second/time, 2=2 seconds/time, 5=5 seconds/time, and so on (can be set from 0 to 20, the default is 1 second/time)	
1	$PAIR062,0,1*3F\r\n	Output GGA statement once per second - 1Hz
2	$PAIR062,1,1*3E\r\n	Output GLL statement once per second - 1Hz
3	$PAIR062,2,1*3D\r\n	Output GSA statement once per second - 1Hz
4	$PAIR062,3,1*3C\r\n	Output GSV statement once per second - 1Hz
5	$PAIR062,4,1*3B\r\n	Output RMC statement once per second - 1Hz
6	$PAIR062,5,1*3A\r\n	Output VTG statement once per second - 1Hz
7	$PAIR062,6,1*39\r\n	Output ZDA statement once per second - 1Hz
8	$PAIR062,7,1*38\r\n	Output GRS statement once per second - 1Hz
9	$PAIR062,8,1*37\r\n	Output a GST sentence once per second - 1Hz
10	$PAIR062,3,2*3F\r\n	Output GSV statement once every 2 seconds - 0.5Hz
11	$PAIR062,3,5*38\r\n	Output GSV statement once every 5 seconds - 0.2Hz

Setting output less than 1000 milliseconds (range: 100~1000ms) is only applicable to GGA and RMC statements

1	$PAIR050,1000*12\r\n	Output GGA and RMC statements once per second - 1Hz
2	$PAIR050,500*26\r\n	Output GGA and RMC statements twice per second - 2Hz
3	$PAIR050,200*21\r\n	Output GGA and RMC statements 5 times per second - 5Hz
4	$PAIR050,100*22\r\n	Output GGA and RMC statements 10 times per second - 10Hz

Note: When configuring multi-Hz output, you need to send $PAIR003*39 (turn off GNSS) before sending the save command. When configuring the statement to output once per second or multiple seconds, just send the save command directly.

Set NMEA output format

Format	$PAIR100,<NMEA mode>,<Proprietary mode>*CS<CR><LF>	
Example	$PAIR100,1,0*3A\r\n ==> ASCII NMEA v4.1, no proprietary statements are output	
NMEA mode	0=disable NMEA, 1=ASCII NMEA v4.1 (default), 2=ASCII NMEA v3.0	
Proprietary mode	0=Do not output proprietary statements (default), 1= Output specific statements	
1	$PAIR100,1,0*3A\r\n	Output ASCII NMEA v4.1, no proprietary statements
2	$PAIR100,2,0*39\r\n	Output ASCII NMEA v3.0, no proprietary statements

3	$PAIR100,0,1*3A\r\n	Output proprietary sentences, do not output NMEA sentences

Query NMEA output format

Format	$PAIR101,<NMEA mode>,<Proprietary mode>*CS<CR><LF>
Example	Send $PAIR101*3A\r\n Return $PAIR101,0,1*3B==>Disable NMEA output, enable proprietary statements
NMEA mode	0=disable NMEA, 1=ASCII NMEA v4.1 (default), 2=ASCII NMEA v3.0
Proprietary mode	0=Do not output proprietary statements (default), 1=Output proprietary statements, 2=Enable proprietary statements and output before NMEA

1	$PAIR101*3A\r\n	NMEA output format query command

Set baud rate

1	$PAIR864,0,0,9600*13\r\n	Support 9600 bps
2	$PAIR864,0,0,38400*23\r\n	Support 38400 bps
3	$PAIR864,0,0,57600*28\r\n	Support 57600 bps
4	$PAIR864,0,0,115200*1B\r\n	Support 115200 bps
5	$PAIR864,0,0,230400*19\r\n	Support 230400 bps
6	$PAIR864,0,0,460800*16\r\n	Support 460800 bps
7	$PAIR864,0,0,921600*10\r\n	Support 921600 bps
8	$PAIR864,0,0,3000000*2F\r\n	Support 3000000 bps

Note: After modifying the port baud rate,Need to restart the device.Changes will take effect after reboot.

Baud rate query command

1	$PAIR865,0,0*31\r\n	Port baud rate query

Restore default settings

1	$PAIR514*3A\r\n	Clear current configuration and restore default settings

Note: $PAIR003*39\r\n needs to be sent before sending the restore default settings command.==>POWER_OFF

2	$PAIR007*3D\r\n	Clear system/user configuration

sleep mode

1	$PAIR382,0*2F\r\n	Unlock sleep mode
2	$PAIR382,1*2E\r\n	Lock sleep mode (system will not go to sleep)

illustrate:**Send commandbackreturn** $PAIR001,382,0*32\r\n ==> Success