GNSS Positioning Module

WKG035BT0FY01

User Manual

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Document Revision History

Version	Revision Description	Revised By	Date
V1.0	Initial Release	Yu Zhiming	2026/1

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1. Functional Description

1.1. Overview

WKG035BT0FY01 is a high-performance 35 × 35 × 13 mm multi-GNSS dual-frequency RTK high-precision positioning module. The module is based on the ATGM332D-F8P multi-frequency, multi-constellation GNSS module independently developed by Allystar, together with high-precision positioning algorithms. It supports multiple satellite navigation systems, including BeiDou-2, BeiDou-3, GPS, QZSS, SBAS, and Galileo, as well as L1 and L5 frequency bands. It can simultaneously receive signals from multiple satellite navigation systems to achieve combined positioning, navigation, and timing.

WKG035BT0FY01 integrates carrier-phase smoothing and multi-frequency ionospheric interference mitigation technologies, enabling centimeter-level positioning accuracy when used with a base station or CORS network. Its multi-constellation and multi-frequency positioning capability improves satellite visibility and ensures high reliability in challenging environments such as urban canyons, wooded areas, and areas under elevated roads or bridges.

The module features a built-in high-speed RTK engine for rapid initialization. Its adaptive anti-interference algorithm can intelligently identify and suppress multipath effects and electromagnetic noise. With a low-power hardware and software architecture, WKG035BT0FY01 achieves a good balance between continuous high-precision positioning performance and power consumption.

With the advantages of high integration, high performance, low power consumption, and cost-effectiveness, WKG035BT0FY01 is suitable for applications including high-precision positioning and navigation, smart logistics, precision agriculture, intelligent driving, and other high-accuracy navigation systems.

1.2. Main Features

- Supports BeiDou-2 and BeiDou-3;
- Supports BDS / GPS / Galileo / GLONASS multi-system combined positioning as well as standalone positioning by a single GNSS system;
- Supports AGNSS;
- Cold-start acquisition sensitivity: -148 dBm;
- Hot-start acquisition sensitivity: -156 dBm;
- Reacquisition sensitivity: -160 dBm;
- Tracking sensitivity: -162 dBm;
- Dual-frequency RTK with centimeter-level high-precision positioning;
- Supports RTCM 3.x;
- Power consumption: ~49 mA @ 5 V in continuous operation; standby current ⩽ 20 μA;
- Built-in LNA, antenna detection, and antenna short-circuit protection;
- Equipped with a 35 × 35 × 4 mm + 25 × 25 × 4 mm stacked high-performance ceramic antenna;

- On-board supercapacitor supports fast hot start;
- Standard NMEA-0183 protocol output.

1.3. Applications

- Precision Agriculture;
- Surveying & Mapping;
- Robotics / AGV / AMR;
- UAV / Drone;
- Vehicle / Fleet High-Precision Positioning;
- Construction Machinery;
- Smart Logistics / Ports;
- Autonomous Systems;
- Timing & Synchronization;
- High-Precision IoT.

1.4. Assisted GNSS

WKG035BT0FY01 global positioning and navigation module supports Assisted GNSS (AGNSS).

AGNSS can provide the receiver with auxiliary information required for positioning, such as ephemeris data, approximate position, and time information. Whether under strong-signal or weak-signal conditions, this information can significantly reduce the Time to First Fix (TTFF).

1.5. Output Protocol

WKG035BT0FY01 global positioning and navigation module uses a standard UART interface as its primary output channel and outputs data in accordance with the standard NMEA0183 4.1 protocol format.

1.6. Performance Specifications

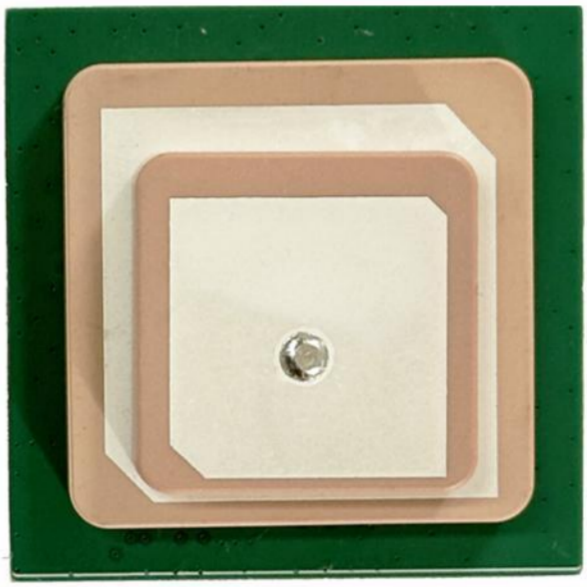
Parameter	Technical Specification
Supported GNSS	BDS：B1I+B1C+B2a GPS/QZSS/SBAS:L1+L5 GALELEO：E1+E5a
Cold Start TTFF	≤20s
Hot Start TTFF	≤1s
Reacquisition TTFF	≤1s
Cold Start Acquisition Sensitivity	-148dBm

Hot Start Acquisition Sensitivity	-156dBm
Reacquisition Sensitivity	-160dBm
Tracking Sensitivity	-162dBm
RTK Initialization Time	＜5s
RTK Positioning Accuracy	1cm+1ppm(CEP50)
Standalone Positioning Accuracy	＜1m(CEP50)
Velocity Accuracy	≤0.1m/s (1σ)
Position Update Rate	1 Hz (default)
Serial Port Characteristics	Baud rate: 115200 bps by default; 8 data bits; no parity; 1 stop bit
Serial Protocol	NMEA0183 4.1
Supply Voltage	3.3V – 5.5V
Typical Power Consumption	~49mA @5V
Dimensions	35x35x13mm

2. Product Description

2.1. Module Appearance

Back



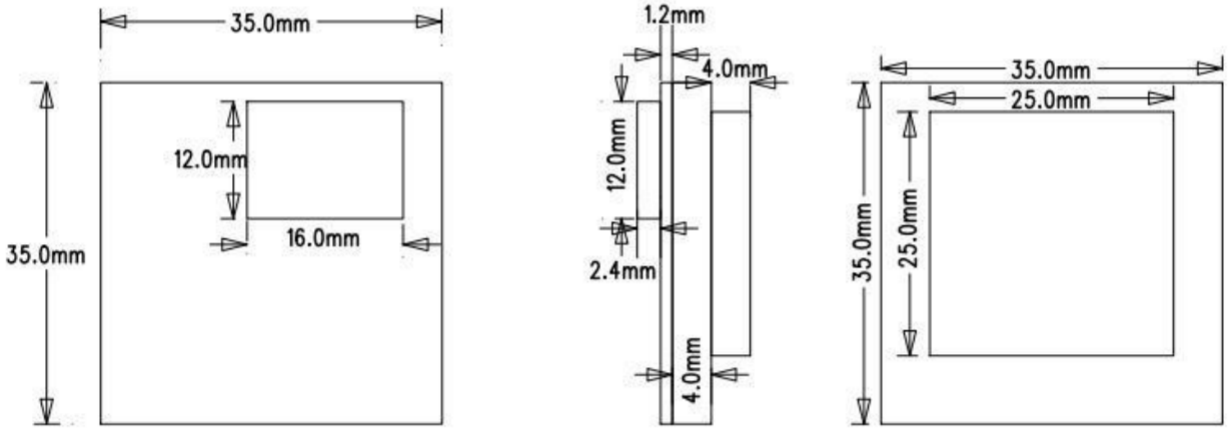
Front

- The front side of the module features a 35 × 35 × 4 mm + 25 × 25 × 4 mm stacked ceramic antenna;
- A supercapacitor is mounted on the back of the module to provide backup power, enabling fast positioning during hot start;
- The back of the module is equipped with a 5-pin 1.25 mm connector (pin order: GND, TXD, RXD, 5V, 1PPS) and is also compatible with a 4-pin 1.25 mm connector without 1PPS. A 5-pin solder pad is provided on the bottom (pin order: GND, TXD, RXD, 5V, GND).

2.2. Pin Description

Pin	Type	Function
5V	P	Power supply, 3.3–5.5 V
TX	IO	RS232 data output
RX	IO	RS232 data input
1PPS	IO	Standard timing pulse output
GND	P	Ground

2.3. Dimensions



3. Electrical Characteristics

3.1. Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Unit
Supply Voltage	VCC	-0.3	5.5	V
Digital Pin Voltage	TXD/RXD/1PPS	-0.3	4.1	V
Maximum ESD Withstand Voltage	VESD(HBM)	-	2000	V
Operating Temperature	Topr	-35	85	℃
Storage Temperature	Tstg	-40	80	℃

3.2. Operating Parameters

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Supply Voltage	VDD	3.3	5	5.5	V
Digital Pin Voltage	Vil	-0.3	0	0.6	V
	Vih	2.7	-	3.6	V
	Vol	-	-	0.4	V
	Voh	2.8		3.3	V
Average Operating Current	Io @VCC=5V	-	49	-	mA
Operating Temperature	Topr	-40	-	85	℃

4. NMEA Protocol

4.1. NMEA Protocol Features

WKG035BT0FY01 GNSS module complies with the international standard NMEA0183 protocol and also supports a proprietary binary protocol. The module can output positioning data such as latitude, longitude, and time through the NMEA0183 protocol. The proprietary binary protocol is used to configure the module, such as setting the position update rate (1 Hz – 10 Hz) and baud rate (default: 115200 bps).

Data is transmitted in serial asynchronous mode. The first bit is the start bit, followed by the data bits. The data bits are transmitted least significant bit (LSB) first.

Data Transmission Format

Start Bit	D0	D1	D2	D3	D4	D5	D6	D7	Stop Bit

Data Transmission Parameters

Baud Rate (bps)	Default: 115200 bps
Data Bits	8 bits
Stop Bits	1 bit
Parity	None

4.2. NMEA Protocol Frame

NMEA Protocol Frame				
	Checksum calculation range			
$	<Address>	{<Value}	*<Checksum>	<CR><LF>
Start Character	Address Field	Data Field	Checksum Field	End Sequence
Each sentence starts with $	Consists of two parts: the talker identifier and the sentence type.	Starts with □. The following values may be variable-length or fixed-length.	The checksum is calculated by performing a byte-by-byte XOR operation on the data between $ and * (excluding both characters), and the result is expressed in hexadecimal format.	Each sentence ends with <CR><LF>

4.3. NMEA Protocol Identifiers

NMEA uses different talker identifiers to distinguish different GNSS modes, as shown below:

Talker	Identifier
BeiDou Navigation Satellite System (BDS)	BD
Global Positioning System (GPS / SBAS / QZSS)	GP
Global Navigation Satellite System (GLONASS)	GL
Global Navigation Satellite System (GNSS)	GN
Proprietary Information	P

4.4. Supported Messages

WKG035BT0FY01 GNSS module supports the following messages. When multi-system combined positioning is used, GN is used as the talker identifier; otherwise, the corresponding single-system identifier is used.

An overview of the supported NMEA messages is shown below:

Message	Class/ID	Description
Standard NMEA Messages		Standard Messages
GGA	0x4E 0x00	Receiver positioning data
GLL	0x4E 0x01	Geographic position — latitude/longitude
GSA	0x4E 0x02	Dilution of Precision (DOP) and active satellites
GSV	0x4E 0x03	Satellites in view
RMC	0x4E 0x04	Recommended minimum navigation data
VTG	0x4E 0x05	Ground speed and course
GST	0x4E 0x07	Receiver pseudorange error statistics
ZDA	0x4E 0x08	Time and date
ANT	0x4E 0x11	Antenna status
LPS	0x4E 0x12	Satellite system leap-second correction information
DHV	0x4E 0x13	Receiver velocity information
UTC	0x4E 0x16	Receiver status and simplified leap-second correction information
Custom NMEA Messages		Custom Messages
CAS00	-	Save configuration information
CAS01	-	Communication protocol and serial port configuration
CAS02	-	Set positioning update rate
CAS03	-	Enable or disable output messages and configure output frequency

CAS04	-	Set initialization system and number of channels
CAS05	-	Set NMEA sentence talker identifier
CAS06	-	Query module software and hardware information
CAS10	-	Startup mode and assistance information configuration
CAS12	-	Standby mode control
CAS20	-	Online firmware upgrade command

The RMC message is one of the most commonly used NMEA messages. By parsing the RMC message, useful information such as longitude, latitude, UTC time, and positioning status can be obtained.

By parsing the TXT message, information such as the manufacturer, software/hardware version, latest firmware update date, and antenna status can be obtained. Antenna status includes open circuit, connected, and short circuit.

4.4.1. GGA

Information	GGA		
Description	Receiver time, position, and positioning-related data		
Type	Output		
Format	$--GGA, UTCtime, lat, uLat, lon, uLon, FS, numSv, HDOP, msl, uMsl, sep, uSep, diffAge.diffSta*CS<CR><LF>		
Example	$GPGGA,235316.00,2959.99025,S,12000.00090,E,1,06,1.21,62.77,M,0.00,M,*7B		
Parameter Description			
Field	Name	Format	Description
1	$--GGA	String	Message ID and GGA sentence header. -- indicates the system identifier.
2	UTCtime	hhmmss.ss	Current UTC time of positioning
3	lat	ddmm.mmmmm	Latitude. The first 2 digits indicate degrees, and the remaining digits indicate minutes.
4	uLat	Character	Latitude direction: N = North, S = South
5	lon	dddmm.mmmmm	Longitude. The first 3 digits indicate degrees, and the remaining digits indicate minutes.
6	uLon	Character	Longitude direction: E = East, W = West
7	FS	Numeric	Indicates the current positioning quality (see Note [1]). This field shall not be empty.
8	numSv	Numeric	Number of satellites used for positioning

9	HDOP	Numeric	Horizontal Dilution of Precision (HDOP)
10	msl	Numeric	Altitude above mean sea level
11	uMsl	Character	Altitude unit, meters; fixed character: M
12	sep	Numeric	Geoid separation, i.e., the difference between ellipsoidal height and mean sea level
13	uSep	Character	Geoid separation unit, meters; fixed character: M
14	diffAge	Numeric	Age of differential correction data. Empty when DGPS is not used.
15	diffSta	Numeric	Differential reference station ID
16	CS	Hexadecimal	Checksum, calculated by XORing all characters between $ and *, excluding $ and *
17	<CR><LF>	Character	Checksum, calculated by XORing all characters between $ and *, excluding $ and *

Note [1] Positioning Quality Indicator	
Indicator	Description
0	Position unavailable or invalid
1	SPS (Single Point Positioning) mode, valid position
6	Estimated mode (Dead Reckoning)

4.4.2. GLL

Information	GLL		
Description	Latitude, longitude, positioning time, positioning status, and other information		
Type	Output		
Format	$--GLL, lat, uLat, lon, uLon, UTCtime, valid, mode*CS<CR><LF>		
Example	$GPGLL,2959.99025,S,12000.00090,E,235316.00,A,A*4E		
Parameter Description			
Field	Name	Format	Description
1	$--GLL	String	Message ID, GLL sentence header; -- is the system identifier
2	lat	ddmm.mmmmm	Latitude: the first 2 digits indicate degrees and the remaining digits indicate minutes
3	uLat	Character	Latitude direction: N = North, S = South
4	lon	dddmm.mmmmm	Longitude: the first 3 digits indicate degrees and the remaining digits indicate minutes
5	uLon	Character	Longitude direction: E = East, W = West
6	UTCtime	hhmmss.ss	Current UTC time of positioning
7	valid	Character	Data validity (see Note [1])
8	mode	Character	Positioning mode (see Note [2]); valid only for NMEA 2.3 and later versions
9	CS	Hexadecimal	Checksum, calculated by XORing all characters between $ and *, excluding $ and *
10	<CR><LF>	Character	Carriage return and line feed
Note [1] Data Validity			
Indicator		Description	
A		Data valid	
V		Data invalid	
Note [2] Positioning Mode Indicator			
Indicator		Description	
A		Autonomous mode	
E		Estimated mode (Dead Reckoning)	
N		Data invalid	
D		Differential mode	
M		Not positioned, but an external input or previously stored position is available	

4.4.3. GSA

Information	GSA		
Description	Satellite IDs used for positioning and DOP information. A GSA sentence is output regardless of whether positioning is valid or satellites are available. When the receiver operates in multi-system combined mode, one GSA sentence is output for each satellite system. Each GSA sentence contains PDOP, HDOP, and VDOP calculated from the combined satellite systems.		
Type	Output		
Format	$--GSA, smode, FS{SVID}, PDOP, HDOP, VDOP*CS<CR><LF>		
Example	$GPGSA,A,3,05,21,31,12,18,29,,,,,,,2.56,1.21,2.25*01		
Parameter Description			
Field	Name	Format	Description
1	$--GSA	String	Message ID, GSA sentence header; -- is the system identifier
2	smode	Character	Mode switching indicator (see Note [1])
3	FS	Numeric	Positioning status indicator (see Note [2])
4	{SVID}	Numeric	Satellite IDs used for positioning. This field displays up to 12 satellite IDs. If more than 12 satellites are available, only the first 12 are output; unused positions are left blank.
5	PDOP	Numeric	Position Dilution of Precision (PDOP)
6	HDOP	Numeric	Horizontal Dilution of Precision (HDOP)
7	VDOP	Numeric	Vertical Dilution of Precision (VDOP)
8	systemId	Character	GNSS system ID defined by NMEA (see Note [3]); valid only for NMEA 4.10 and later versions
9	CS	Hexadecimal	Checksum, calculated by XORing all characters between $ and *, excluding $ and *
10	<CR><LF>	Character	Carriage return and line feed
Note [1] Mode Switching Indicator			
Indicator		Description	
M		Manual switching. Forced 2D or 3D operating mode	
A		Automatic switching. The receiver automatically switches between 2D and 3D positioning modes	
Note [2] Positioning Status Indicator			
Indicator		Description	
1		Position invalid	
2		2D positioning	
3		3D positioning	

4.4.4. GSV

Information	GSV		
Description	Information about visible satellites, including satellite ID, elevation, azimuth, and carrier-to-noise ratio. The number of {Satellite ID, Elevation, Azimuth, C/N0} parameter groups in each GSV sentence is variable, with a maximum of 4 groups and a minimum of 0 groups.		
Type	Output		
Format	$--GSV, numMsg, msgNo, numSv{SVID, ele, az, cn0} *CS<CR><LF>		
Example	$GPGSV,3,1,10,25,68,053,47,21,59,306,49,29,56,161,49,31,36,265,49*79 $GPGSV,3,2,10,12,29,048,49,05,22,123,49,18,13,000,49,01,00,000,49*72 $GPGSV,3,3,10,14,00,000,03,16,00,000,27*7C		
Parameter Description			
Field	Name	Format	Description
1	$--GSV	String	Message ID, GSV sentence header; -- is the system identifier
2	numMsg	Character	Total number of sentences. Each GSV sentence can contain information for up to 4 visible satellites. Therefore, multiple GSV sentences are required when more than 4 satellites are visible.
3	msgNo	Numeric	Current sentence number
4	numSv	Numeric	Total number of visible satellites
5	[,SVID, ele, az, cn0]	Numeric	In sequence: satellite ID; elevation, range 0–90°, unit: degrees; azimuth, range 0–359°, unit: degrees; carrier-to-noise ratio, range 0–99 dB-Hz. If the satellite is not being tracked, the field is left blank.
6	signalId	Numeric	GNSS signal ID defined by NMEA (0 indicates all signals); valid only for NMEA 4.10 and later versions
7	CS	Hexadecimal	Checksum, calculated by XORing all characters between $ and *, excluding $ and *
8	<CR><LF>	Character	Carriage return and line feed

4.4.5. RMC

Information	RMC		
Description	Recommended minimum positioning information		
Type	Output		
Format	$--RMC, UTCtime,status, lat, uLat, lon, uLon, spd, cog, date, mv, mvE, mode*CS<CR><LF>		
Example	$GPRMC,235316.00,A,2959.99025,S,12000.00090,E,0.009,75.020,020711,A*45		
Parameter Description			
Field	Name	Format	Description
1	$--RMC	String	Message ID, RMC sentence header; -- is the system identifier
2	UTCtime	hhmmss.ss	Current UTC time of positioning
3	status	Character	Position validity indicator: V = receiver warning/data invalid; A = data valid
4	lat	ddmm.mmmmm	Latitude: the first 2 digits indicate degrees and the remaining digits indicate minutes
5	uLat	Character	Latitude direction: N = North, S = South
6	lon	dddmm.mmmmm	Longitude; the first 3 digits indicate degrees and the remaining digits indicate minutes
7	uLon	Character	Longitude direction: E = East, W = West
8	spd	Numeric	Speed over ground, unit: knots
9	cog	Numeric	True course over ground, unit: degrees
10	date	ddmmyy	Date: dd = day, mm = month, yy = year
11	mv	Numeric	Magnetic variation, unit: degrees; fixed as blank
12	mvE	Character	Magnetic variation direction: E = East, W = West; fixed as blank
13	mode	Character	Positioning mode indicator (see Note [1])
14	navStatus	Character	Navigation status indicator. V indicates that the system does not output navigation status information. Valid only for NMEA 4.10 and later versions.
15	CS	Hexadecimal	Checksum, calculated by XORing all characters between $ and *, excluding $ and *

16	<CR><LF>	Character	Carriage return and line feed
Note [1] Positioning Mode Indicator			
Indicator		Description	
A		Autonomous mode	
E		Estimated mode (Dead Reckoning)	
N		Data invalid	
D		Differential mode	
M		Not positioned, but an external input or previously stored position is available	

4.4.6. VTG

Information	VTG		
Description	Ground speed and course over ground information		
Type	Output		
Format	$--VTG,cogt,T,cogm,M,sog,N,kph,K,mode*CS<CR><LF>		
Example	$GPVTG,75.20,T,,M,0.009,N,0.017,K,A*02		
Parameter Description			
Field	Name	Format	Description
1	$--VTG	String	Message ID, VTG sentence header; -- is the system identifier
2	cogt	Numeric	True course over ground, unit: degrees
3	T	Character	True north indicator, fixed as T
4	cogm	Numeric	Magnetic course over ground, unit: degrees
5	M	Character	Magnetic north indicator, fixed as M
6	sog	Numeric	Speed over ground, unit: knots
7	N	Character	Speed unit, knots; fixed as N
8	kph	Numeric	Speed over ground, unit: km/h
9	K	Character	Speed unit, km/h; fixed as K
10	mode	Character	Positioning mode indicator (see Note [1])
11	CS	Hexadecimal	Checksum, calculated by XORing all characters between $ and *, excluding $ and *
12	<CR><LF>	Character	Carriage return and line feed
Note [1] Positioning Mode Indicator			
Indicator		Description	
A		Autonomous mode	
E		Estimated mode (Dead Reckoning)	

N	Data invalid
D	Differential mode
M	Not positioned, but an external input or previously stored position is available

4.4.7. ZDA

Information	ZDA		
Description	Time and date information		
Type	Output		
Format	$--ZDA,UTCtime,day,month,year,ltzh,ltzn*CS<CR><LF>		
Example	$GPZDA,235316.00,02,07,2011,00,00*51		
Parameter Description			
Field	Name	Format	Description
1	$--ZDA	String	Message ID, ZDA sentence header; -- is the system identifier
2	UTCtime	hhmmss.ss	UTC time at positioning
3	day	Numeric	Day, fixed two digits, range: 01–31
4	month	Numeric	Month, fixed two digits, range: 01–12
5	year	Numeric	Year, fixed four digits
6	ltzh	Numeric	Local time zone hours; not supported, fixed as 00
7	ltzn	Numeric	Local time zone minutes; not supported, fixed as 00
8	CS	Hexadecimal	Checksum, calculated by XORing all characters between $ and *, excluding $ and *
9	<CR><LF>	Character	Carriage return and line feed

4.4.8. DHV

Information	DHV		
Description	Detailed receiver velocity information		
Type	Output		
Format	$--DHV,UTCtime,speed3D,spdX,spdY,spdZ,gdspd*CS<CR><LF>		
Example	$GNDHV,021150.00,0.03,0.006,-0.042,-0.026,0.06*65		
Parameter Description			
Field	Name	Format	Description
1	$--DHV	String	Message ID, DHV sentence header; -- is the system identifier
2	UTCtime	hhmmss.ss	Current UTC time
3	speed3D	Numeric	Receiver 3D velocity, unit: m/s
4	spdX	Numeric	Receiver velocity along the ECEF-X axis, unit: m/s
5	spdY	Numeric	Receiver velocity along the ECEF-Y axis, unit: m/s
6	spdZ	Numeric	Receiver velocity along the ECEF-Z axis, unit: m/s
7	gdspd	Numeric	Receiver horizontal ground speed, unit: m/s
8	CS	Hexadecimal	Checksum, calculated by XORing all characters between $ and *, excluding $ and *
9	<CR><LF>	Character	Carriage return and line feed

4.4.9. UTC

Information	UTC (supported by timing products only)		
Description	Receiver status and simplified leap-second correction information		
Type	Output		
Format	$--UTC,UTCtime,lat,uLat,lon,uLon,FS,numSv,HDOP,hgt,uMsl,date,antSta,timeSrc,leapValid,dtLsf,dtLsf,leapTime*CS<CR><LF>		
Example	$GNUTC,235402.00,3200.00001,N,11900.00005,E,1,20,0.6,10.5,M,311216,0,0,1,17,18,1216*0C		
Parameter Description			
Field	Name	Format	Description
1	$--UTC	String	Message ID, UTC sentence header
2	UTCtime	hhmmss	Current UTC time, in hour/minute/second format
3	lat	ddmm.mmmmm	Latitude; the first 2 digits indicate degrees and the remaining digits indicate minutes
4	uLat	Character	Latitude direction: N = North, S = South

5	lon	dddmm.mmmmm	Longitude; the first 3 digits indicate degrees and the remaining digits indicate minutes
6	uLon	Hexadecimal	Checksum, XOR result of all characters between $ and *, excluding $ and *
7	FS	Numeric	Indicates the current positioning quality (see Note [1]); this field shall not be empty
8	numSv	Numeric	Number of satellites used for positioning, 00–24
9	HDOP	Numeric	Horizontal Dilution of Precision (HDOP)
10	hgt	Numeric	Height
11	uMsl	Character	Height unit, meters; fixed character M
12	date	ddmmyy	Current positioning date, in day/month/year format
13	antSta	Numeric	Antenna status: 0 = antenna open; 2 = antenna normal; 3 = antenna short circuit
14	timeSrc	Numeric	Current timing source: 0 = GPS system; 1 = BDS system
15	leapValid	Numeric	Leap-second correction validity: 0 = no valid leap-second value; 1 = leap-second value valid
16	utcLs	Numeric	Current leap second
17	utcLsf	Numeric	Predicted leap second; blank if invalid
18	leapTime	mmyy	Predicted leap-second occurrence month/year; blank if invalid
19	CS	Hexadecimal	Checksum, calculated by XORing all characters between $ and *, excluding $ and *
20	<CR><LF>	Character	Carriage return and line feed

Note [1] Positioning Quality Indicator	
Indicator	Description
0	Position unavailable or invalid
1	SPS (Single Point Positioning) mode, valid position
2	Differential SPS mode, valid position
3	PPS (Precise Positioning Service) mode, valid position
4	RTK mode, integer ambiguity fixed
5	RTK mode, integer ambiguity float
6	Estimated mode (Dead Reckoning)

4.4.10. GST

Information	GST		
Description	Detailed receiver pseudorange measurement accuracy information		
Type	Output		
Format	$--GST,UTCtime,RMS,stdDevMaj,stdfDevMin,orientation,stdLat,stdLon,stdAlt*CS<CR><LF>		
Example	$BDGST,081409.00,0.5,,,,0.2,0.1,0.4*5E		
Parameter Description			
Field	Name	Format	Description
1	$--GST	String	Message ID, GST sentence header; -- is the system identifier
2	UTCtime	hhmmss.ss	Current UTC time
3	RMS	Numeric	RMS value of the receiver pseudorange error standard deviation during positioning, unit: meters
4	stdDevMaj	Numeric	Position standard deviation along the semi-major axis of the receiver error ellipse; not supported
5	stdfDevMin	Numeric	Position standard deviation along the semi-minor axis of the receiver error ellipse; not supported
6	orientation	Numeric	Orientation of the semi-major axis of the receiver error ellipse; not supported
7	stdLat	Numeric	Standard deviation of receiver latitude error, unit: meters
8	stdLon	Numeric	Standard deviation of receiver longitude error, unit: meters
9	stdAlt	Numeric	Standard deviation of receiver altitude error, unit: meters
10	CS	Hexadecimal	Checksum, calculated by XORing all characters between $ and *, excluding $ and *
11	<CR><LF>	Character	Carriage return and line feed

5. Custom NMEA Messages

For details, please refer to the manual “Hangzhou Zhongke Microelectronics BD/GNSS Receiver Interface Protocol Specification (PDF)”.

6. Contact us

Company： Guangdong Weila Intelligent Technology Co., Ltd
TEL： 13602688458(Mr. Zeng)
Email： sales@weikengtech.com
ADD： Floor 11, Block A, Building 9, Baoneng Science and Technology Park, Qingxiang Road, Longhua District, Shenzhen