



GlobalTop Tech Inc.
宇誠科技股份有限公司

Document	Global Top Binary Sentence Function Specification				
Author	Hector Su	Date	2011.10.27	Ver.	1.3



Global Top Custom-made Function Specification

V 1.3

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Version History

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1. Provide Function

1.1

It supports to output custom-made sentence. It provides 3 modes:

1. **Binary Sentence**
2. **Standard NMEA Sentence** (default)

The format is shown in **Table 1**.

1.2

It supports custom-made command to switch mode between **Binary Sentence** and **Standard NMEA Sentence** mode, the format of command is shown in **Table 2**.

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Table 1 Custom-made Data Format

Name	Example	Units	Description
Preamble header	0x04 0x24	2 bytes	Preamble header
UTC Time	0x03 0xDF 0x12 0xD8	4 bytes MSB to LSB ^(Note 2.3)	UTC Time(hhmmss.sss) $064951.000 \times (10^3) = 64951000 \rightarrow$ 0x03DF12D8
Date	0x00 0x01 0x3C 0x72	4 bytes MSB to LSB	Date(ddmmyy) 20101008 \rightarrow 81010 \rightarrow 0x00013C72
Latitude	0x01 0x60 0x74 0xCC	4 bytes MSB to LSB	Latitude (in decimal degrees) $23.098572 \times (10^6) = 23098572 \rightarrow$ 0x016074CC
N/S Indicator	0x01	1 byte	0x01 \rightarrow North or 0x02 \rightarrow South
Longitude	0x07 0x2B 0x64 0xDF	4 bytes MSB to LSB	Longitude (in decimal degrees) $120.284383 \times (10^6) = 120284383 \rightarrow$ 0x072B64DF
E/W Indicator	0x01	1 byte	0x01 \rightarrow East or 0x02 \rightarrow West
Fix Quality	0x03	1 byte	0x01 :GPS No Fix 0x02 :2D GPS Fix 0x03 :3D GPS Fix

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Fix Mode	0x01	1 byte	0x00 → GPS No Fix 0x01 → GPS Fix without DGPS mode 0x02 → GPS Fix with DGPS mode
Altitude	0x00 0x00 0x0F 0x9B	4 bytes MSB to LSB	Altitude of current position (meter) 39.95 → 39.95*100=3995 → 0x00000F9B
Course over ground	0x00 0x00 0x16 0xB8	4 bytes MSB to LSB	Course over ground(in degree) 58.16 → 58.16*100=5816 → 0x000016B8
Speed over ground	0x00 0x00 0x00 0x3E	4 bytes MSB to LSB	Ground Speed(km/hr) 0.62 → 0.62*100=62 → 0x0000003E
Satellites in view	0x0A	1 byte	Number of satellite is in viewed
Satellites in used	0x09	1 byte	Number of satellite is in used
HDOP	0x00 0x69	2 bytes MSB to LSB	Horizontal Dilution of Precision 1.05 → 1.05*100=105 → 0x0069
EPE	0x01 0x0D	2 bytes MSB to LSB	Estimated position error (meter) 2.69 → 2.69*100=269 → 0x010D
Asterisk	0x2A	1 byte	
Checksum	0x47	1 byte	(Note 2.2)
End Word	0x0D 0x0A	2 bytes	End of message termination (ASCII 13, ASCII 10)

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Table 2 Custom-made Command Format

Name	Example	Units	Description
Message ID	\$PGCMD		Custom-made header of command
Number of command	21		This number represents which command is used
Selection of mode	1		Selection of mode 1→Binary Sentence mode 3→Standard NMEA Sentence mode
Checksum	*6F		(Note 2.1)
<CR> <LF>			End of message termination (ASCII 13, ASCII 10)

Caution 1: When switch back to Standard NMEA mode, the period of sentence will be GGA(1), GSA(1), GSV(5), RMC(1), VTG(1), GLL(0), ZDA(0).

Caution 2 : The command has the different parameter and acknowledge. The format of acknowledge is shown in Table 3.

Example:

- ❖ \$PGCMD,21,1*6F<CR><LF>
- ❖ \$PGCMD,21,3*6D<CR><LF>

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Table 3 Custom-made Acknowledge Format

Name	Example	Units	Description
Message ID	\$PGACK		Custom-made header of command
Number of command	21		This number represents which acknowledge is used
Status	1		It supports 4 status: 1→Binary Sentence mode be set 3→Standard NMEA Sentence mode be set -1→Mode switch fail
Checksum	*6C		(Note 2.1)
<CR> <LF>			End of message termination (ASCII 13, ASCII 10)

Example:

- ❖ \$PGACK,21,1*6C<CR><LF>
- ❖ \$PGACK,21,3*6E<CR><LF>
- ❖ \$PGACK,21,-1*41<CR><LF>

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2. Note

2.1

The checksum will be calculated by **Xor** all characters between \$ and *.

2.2

The checksum will be calculated by **Xor** all bytes between **Preamble header** and **Asterisk**.

2.3

It converts decimal value to hex value, and it provides example below:

- ❖ $(79)_{10} = (4F)_{16}$
- ❖ $(120)_{10} = (78)_{16}$
- ❖ $(64951000)_{10} = (03DF12D8)_{16}$

Decimal Hex Conversion Chart:

<http://www.binaryhexconverter.com/decimal-to-hex-converter>

Decimal	Hexadecimal
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	A
11	B
12	C
13	D
14	E
15	F

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