

NMEA-0183 GPS Output Structure

\$GPGGA Output Sentence:

**\$GPGGA,180432.00,4027.027912,N,08704.857070,
W,2,07,1.0,212.15,M,-33.81,M,4.2,0555*73**

Field	Value	Meaning
1	<u>180432.00</u>	UTC of position fix in hhmmss.ss format (18 hours, 4 minutes and 32 seconds)
2	<u>4027.027912</u>	Geographic latitude in ddmm.mmmmmm format (40 degrees and 27.027912 minutes)
3	N	Direction of latitude (N - North, S - South)
4	<u>08704.857070</u>	Geographic longitude in dddmm.mmmmmm format (87 degrees and 4.85707 minutes)
5	W	Direction of longitude (E - East, W - West)
6	2	GPS quality indicator (0 - fix not valid, 1 - GPS fix, 2 - DGPS fix)
7	07	Number of satellites in use (00-12)
8	1.0	Horizontal DOP
9	<u>212.15</u>	Antenna height above MSL (mean sea level) reference (212.15 m)
10	M	Unit of altitude (meters)
11	<u>-33.81</u>	Geoidal separation (-33.81 m)
12	M	Unit of geoidal separation (meters)
13	4.2	Age of differential GPS data record
14	0555	Base station ID (0000-1023)

\$GPGLL Output Sentence:

\$GPGLL,4027.027912,N,08704.857070,W, 180432.00,A,D*7A

Field	Value	Meaning
1	<u>4027.027912</u>	Geographic latitude in ddmm.mmmmmm format (40 degrees and 27.027912 minutes)
2	N	Direction of latitude (N - North, S - South)
3	<u>08704.857070</u>	Geographic longitude in dddmm.mmmmmm format (87 degrees and 4.85707 minutes)
4	W	Direction of longitude (E - East, W - West)
5	<u>180432.00</u>	UTC of position fix in hhmmss.ss format (18 hours, 4 minutes and 32 seconds)
6	A	'A' shows that data is valid

7	D	Mode indication (A - autonomous, D - differential, N - data not valid)
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\$GPRMC Output Sentence:

\$GPRMC,180432,A,4027.027912,N,08704.857070,W, 000.04,181.9,131000,1.8,W,D*25

Field	Value	Meaning
1	<u>180432</u>	UTC of position fix in hhmmss format (18 hours, 4 minutes and 32 seconds)
2	A	Status (A - data is valid, V - warning)
3	<u>4027.027912</u>	Geographic latitude in ddmm.mmmmmm format (40 degrees and 27.027912 minutes)
4	N	Direction of latitude (N - North, S - South)
5	<u>08704.857070</u>	Geographic longitude in dddmm.mmmmmm format (87 degrees and 4.85707 minutes)
6	W	Direction of longitude (E - East, W - West)
7	000.04	Speed over ground (0.04 knots)
8	181.9	Track made good (heading) (181.9°)
9	131000	Date in ddmmyy format (October 13, 2000)
10	1.8	Magnetic variation (1.8°)
11	W	Direction of magnetic variation (E - East, W - West)
12	D	Mode indication (A - autonomous, D - differential, N - data not valid)

\$PTNL,GGK Output Sentence:

\$PTNL,GGK,180432.00,101300,4027.0279123,N,
08704.8570697,W,4,07,1.7,EHT178.340,M*69

Field	Value	Meaning
1	<u>180432.00</u>	UTC of position fix in hhmmss.ss format (18 hours, 4 minutes and 32 seconds)
2	101300	Date in mmddyy format (October 13, 2000)
3	<u>4027.0279123</u>	Geographic latitude in ddmm.mmmmmm format (40 degrees and 27.0279123 minutes)
4	N	Direction of latitude (N - North, S - South)
5	<u>08704.8570697</u>	Geographic longitude in dddmm.mmmmmm format (87 degrees and 4.8570697 minutes)
6	W	Direction of longitude (E - East, W - West)
7	4	GPS quality indicator (0 - fix not available or invalid, 1 - autonomous GPS fix, 4 - DGPS)
8	07	Number of satellites in use (00-12)
9	1.7	DOP of fix

10	<u>EHT178.340</u>	Antenna height above ellipsoid (178.34 m)
11	M	Unit of ellipsoidal height (meters)

Note: The descriptions of NEMA-0183 GPS output sentences are based on the AgGPS 132 Operation Manual (Trimble Navigation Limited, Sunnyvale, CA). The underlined values are to be used in calculations.

Last updated: October 31, 2000

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