

POS/MV NMEA Sentence Formats.

1. \$INGGA- Global Positioning Fix Data

Time, position and fix related data.

\$INGGA,hhmmss.sss,llll.llll,a,yyyyy.yyyyy,b,t,nn,v.v,x.x,M,,,c.c,rrrr*hh<CRLF>

Item	Definition	Value	Units (if applicable)
\$INGGA	Header	\$INGGA	
hhmmss.sss	UTC time of position	N/A	Hours Minutes Seconds.decimal Two fixed digits of hours Two fixed digits of minutes Two fixed digits of seconds Three digits for decimal fractions Of a second
llll.llll	Latitude	-90 to +90	Degrees Minutes.decimal Two fixed digits of degrees Two fixed digits of minutes Five digits for decimal values
a	N (north) or S (south)	N or S	
yyyyy.yyyyy	Longitude	-180 to +180	Degrees Minutes.decimal Three fixed digits of degrees Two fixed digits of minutes Five digits for decimal values
b	E (east) or W (west)	E or W	
t	GPS quality Indicator	0=fix not available or invalid 1=C/A standard GPS; fix valid 2=DGPS mode; fix valid 3=PPP mode fix valid 4=RTK fixed 5=RTK float 6=Free inertial	

nn	Number of satellites used in the fix	0 to 32	
v.v	Horizontal dilution of precision		
x.x	Altitude of the IMU above or below mean sea level. A negative value indicates below sea level	N/A	Metres
m	Units of measure = metres	M	
Null	Null		
Null	Null		
c.c	Age of differential corrections in seconds since last RTCM-104 Message	0 to 99.9	Seconds
rrrr	DGPS reference station identity	0000 to 1023	
*hh	Checksum		
<CRLF>	Carriage return and line feed	<CRLF>	

2. \$INHDT- Heading – True Data

True Vessel heading in degrees.

\$INHDT,xxx.x,T*hh<CRLF>

Item	Definition	Value	Units (if applicable)
\$INHDT	Header	\$INHDT	
xxx.x	True vessel heading in the vessel frame	0 to 359.9	Degrees
T	True	T	
*hh	Checksum		
<CRLF>	Carriage return and line feed	<CRLF>	

3. \$INGST- GPS Pseudorange Noise Statistics

GPS Pseudorange noise statistics indicate the quality of the position solution delivered by the integrated navigation solution.

\$INGST,hhmmss.sss,,smjr.smjr,smnr.smnr,o.o,l.l,y.y,a.a*hh<CRLF>

Item	Definition	Value	Units (if applicable)
\$INGST	Header	\$INGST	
hhmmss.sss	UTC time of position	N/A	Hours Minutes Seconds.decimal Two fixed digits of hours Two fixed digits of minutes Two fixed digits of seconds Three digits for decimal fractions Of a second
Null	Not Supported	Null	T
smjr.smjr	Standard deviation of semi-major axis of error ellipse	N/A	Metres
smnr.smnr	Standard deviation of semi-minor axis of error ellipse	N/A	Metres
o.o	Orientation	0 to 359.9	Degrees from true north

	of semi-major axis of error ellipse		
l.l	Standard deviation of latitude	N/A	Metres
y.y	Standard deviation of longitude	N/A	Metres
a.a	Standard deviation of altitude	N/A	Metres
*hh	Checksum		
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4. \$INZDA Time and Date

Time and date.

\$INZDA,hhmmss.sss,DD,MM,YYYY,,*hh<CRLF>

Item	Definition	Value	Units (if applicable)
\$INZDA	Header	\$INZDA	
hhmmss.sss	UTC time of position	N/A	Hours Minutes Seconds.decimal Two fixed digits of hours Two fixed digits of minutes Two fixed digits of seconds Three digits for decimal fractions Of a second
DD	Dayof Month	01 to 31	
MM	Month of Year	01 to 12	
YYYY	Year		
Null	Null		

Null	Null	
*hh	Checksum	
<CRLF>	Carriage return and line feed	<CRLF>

5. \$PASHR – Attitude Data

Attitude Data.

\$PASHR,hhmmss.sss,xxx.xx,T,RRR.RR,PPP.PP,HHH.HH,a.aaa,b.bbb,c.ccc,d,e*hh<CRLF>

Item	Definition	Value	Units (if applicable)
\$PASHR	Header	\$PASHR	
hhmmss.sss	UTC time of position	N/A	Hours Minutes Seconds.decimal Two fixed digits of hours Two fixed digits of minutes Two fixed digits of seconds Three digits for decimal fractions Of a second
xxx.xx	True vessel heading	0 to 359.99	Degrees
T	True	T	
RRR.RR	Roll	-90.00 to +90.00	Degrees
PPP.PP	Pitch	-90.00 to +90.00	Degrees
HHH.HH	Heave	-99.00 to +99.00	Metres
a.aaa	Accuracy Roll	0 to 9.999	Degrees
b.bbb	Accuracy Pitch	0 to 9.999	Degrees
c.ccc	Accuracy Heading	0 to 9.999	Degrees

d	Flag: Accuracy heading	0,1,2	0 = no aiding 1 = GPS aiding 2 = GPS & GAMS aiding
e	Flag:IMU	0,1	0 = IMU out 1 = Satisfactory
*hh	Checksum		
<CRLF>	Carriage return and line feed	<CRLF>	