

NMEA Sentences for IMES
Draft Document

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1. Introduction

This document describes about NMEA sentences for IMES. The following two sentences are defined:

\$IMPOSPosition Data

\$IMMID IMES Message ID

2. \$IMPOS Position Data

POS: IMES Position Message			
No	Sentence Description	Format	Notes
1	Header	\$	
2	Talker ID	IM	
3	Sentence ID	POS	
4	Time (UTC)	hhmmss	UTC data is from the device or receiver if available otherwise the field is blank. Seconds resolution as per GPS NMEA
5	Status	Integer value Range: 0 - 9	0 = Invalid Data, Do not use 1 = IMES Output from Single Transmitter 2 = IMES Output from All Visible Transmitter 9 = DEBUG / Test Value
6	PRN ID	Integer Value	173 – 182
7	C/No	Integer Value	0 – 99 dB-Hz
8	Message Type	Integer value	0 = 2-D Position with Floor ID 1 = 3-D Position with Floor ID
9	Latitude	ddmm.mmmm	Latitude in IMES Message Degree and decimal minutes In the same format and resolution as in GPS NMEA
10	N/S indicator	Character	N = North, S = South
11	Longitude	dddmm.mmmm	Longitude in IMES Message Degree and decimal minutes In the same format and resolution as in GPS NMEA
12	E/W Indicator	Character	E = East, W = West
13	Altitude	Integer value Range: -95m to 4,000m	Altitude in IMES Message As per IMES IS document
14	Altitude Unit	Character	M = Meter
15	Floor ID	Floating value Range: -50 to 204 th Floor	Floor ID in IMES Message As per IMES IS document Negative values indicate floors below ground level.
16	Accuracy Index	Integer Value	0 = Indefinable 1 = IMES Accuracy better than 7m 2 = IMES Accuracy between 7 – 15 m 3 = IMES Accuracy more than 15m Refer QZSS IS Doc Table 1.3.1-4, Page A9
17	Checksum	*CS	As per NMEA Standard
18	Carriage Return & Line Feed	<CR><LF>	
Example:			

3. \$IMMID IMES Message ID

UID: IMES Message ID			
No	Sentence Description	Format	Notes
1	Header	\$	
2	Talker ID	IM	
3	Sentence ID	MID	
4	Time (UTC)	hhmmss	UTC data is from the device or receiver if available otherwise the field is blank. Seconds resolution as per GPS NMEA
5	Status	Integer value	0 = Invalid Data, Do not use 1 = IMES Output from Single Transmitter 2 = IMES Output from All Visible Transmitter 9 = DEBUG / Test Value See : Status Values
6	PRN ID	Integer Value	173 – 182
7	C/No	Integer Value	0 – 99 dB-Hz
8	Message Type	Integer value	3 = Short ID 4 = Medium ID
9	SID_H	HEX Value	Short ID in Hexadecimal Values 12 bits represented in HEX by 3 nibbles
10	MID_H	HEC Value	Medium ID in Hexadecimal Values 33 bits represented in HEX by 9 nibbles 3 MSBs are always zeros.
11	Boundary Bit (BD Bit)	Integer value	0 = IMES Transmitter is inside the building 1 = IMES Transmitter is at or near the Entrance of a Building where other GNSS signals may also be visible Or where inside / outside zone is not clearly defined. For Example: a dock yard with big metal roof
12	Checksum	*CS	As per NMEA Standard
13	Carriage Return & Line Feed	<CR><LF>	
Example:			

4. Status Values

0 = Invalid Data, Do not use

1 = IMES output from Single Transmitter selected by the receiver/application. Although, multiple transmitter signals are visible, output from only one signal is provided.

2 = IMES output from all visible transmitters

3 = Hybrid output, IMES + Other System Solution

4 = Output from GPS Receiver in the device

5 = Output from the Device's Location Engine

6 = Reserve

7 = Reserve

8 = Reserve

9 = DEBUG / Test Value

5. Opinion Table

Sentence ID	Originator	Date	Comments / Decisions
\$IMPOS	GNSS/DM	2016/04/25	PRN ID & C/No are added
Status Value	GNSS/DM	2016/04/25	Status Values shall be reviewed and well defined
\$IMCIF	IMES Conso Meeting 2016/4/20	2016/04/25	New Sentence \$IMCIF is added for information of all visible IMES signals Add one sentence that shows all the visible signal status.
\$IMCIF	GNSS/DM	2016/04/25	This message is not necessary if \$IMPOS is repeatedly transmitted for all visible IMES signals
\$IMSIF	GNSS/DM	2016/04/25	This sentence is deleted because information in this sentence is included in \$IMPOS
Output of Frequency Offset Value	IMES Conso Meeting 2016/4/20	2016/04/25	This output is removed because, the receiver can't measure the actual frequency offset value due to clock errors in transmitter and receiver. Frequency Output Value in the Message is not necessary.
\$IMTIM	GNSS/OK	2016/04/25	A new Message added to provide information related with Time.
\$IMTIM	GNSS/DM	2016/04/25	Additional information are necessary to define the parameters and how to measure/calculate values
\$IMUID	GNSS/DM	2016/04/25	\$IMUID sentence shall also be defined for multiple visible IMES signals
\$IMDBA	GNSS/DM	2016/04/25	\$IMDBA sentence shall also be defined for multiple visible IMES signals
\$IMDBB	GNSS/DM	2016/04/25	\$IMDBB sentence shall also be defined for multiple visible IMES signals
\$IMUID	GNSS/DM		\$IMUID changed to \$IMMID
\$IMPOS	IMES Conso Meeting 2016/5/17	2016/05/26	Output for Only one POS data or all visible POS data shall be defined by the application in the receiver. Based on this output the status value shall be defined so that the user can know whether the position output is only one single output from visible IMES or not.
\$IMCIF	Same as above	2016/05/26	This message is no more required because \$IMPOS is repeatedly output for all visible transmitters if required. If this type of sentence is required, the application maker shall generate the sentence as Proprietary Sentence.
\$IMDSA	Same as above	2016/05/26	This message is no more required because a set of SID is already reserved for Emergency / Disaster Message use. Thus, the application can identify whether the message s for emergency use or normal use based on SID value.
\$IMDSB	Same as	2016/05/26	This message is no more required because a set of MID

