1.8 x 10308. The floating-point number is precise to 15 decimal digits.

63	62 ... 52	51 ... 0
S	Exp. + Bias	Fraction

0 000 0000 0000 0000 0000 ... 0000 0000 0000 = 0.0
0 011 1111 1111 0000 0000 ... 0000 0000 0000 = 1.0
1 011 1111 1110 0110 0000 ... 0000 0000 0000 = -0.6875
1 111 1111 1111 1111 1111 ... 1111 1111 1111 = NaN

5.2.2. Binary Output ICD

Binary output is provided using Trimble GSOF message format. The Figure 32 represents binary message selection selectable through web user interface.

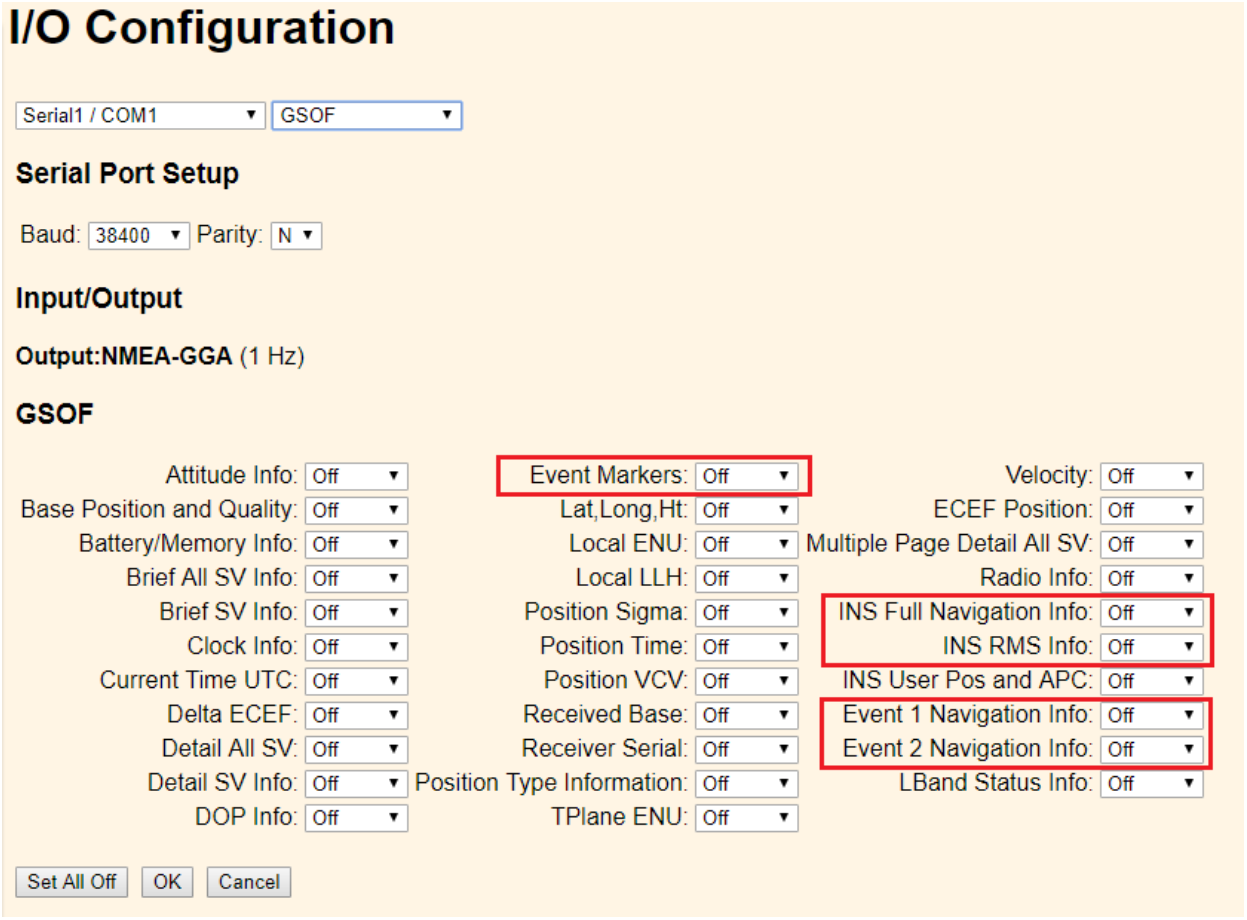

Figure 32: Binary Message Selection

GSOF messages are output as a part of Report Package 40H represented in Table 5.

Table 5: General Output Record Report 40H

Byte #	Item	Type	Value	Description
0	STX	CHAR	02h	Start transmission
1	Status	CHAR	Bit 1 -> Low battery Bits0,2-7-> Reserved	
2	Packet Type	CHAR	40h	Report package 40H
3	Length	CHAR	??h	Single byte # of data bytes, limits data to 255 bytes
Data Byte Start				
4	Transmission Number	CHAR	??h	unique number assigned to a chapter of pages indicating that the pages are from the same group.
5	Page Index	CHAR	??h	page number of this page in a sequence (chapter) of pages and is zero based.
6	Max Page Index	CHAR	??h	the index of the last page
GSOF Message Type				
GSOF Message Type				
Data Byte End				
n-2	Checksum	CHAR	??h	(status + type + length + data bytes) modulo 256
n-1	ETX	CHAR	03h	End transmission

If the data portion exceeds maximum length limit of 255 bytes, the data packet will be broken in two or more consecutive pages where the Page Index indicates the current page and MAX Page Index indicates the total number of pages to be received in order to obtain full data section.

Page Numbering – The Page Index and Max Page Index fields are 0-based, so for example the first transmission of a 2-page set will be 0/1 (PAGE/MAX PAGE) and the 2nd (last) page will be 1/1. The total number of pages is MAX PAGE INDEX + 1.

The full set of GNSS-INS navigation parameters including position, attitude, velocity and accuracy is captured by two GSOF messages “INS Full Navigation Info” and “INS RMS Info”.

GSOF Message Types for output of integrated navigation solution and corresponding RMS values are listed in Table 6 and Table 7.

GSOF 49 (31H) INS Integrated Navigation Solution:

Table 6: GSOF 49 (31H)

Byte #	Item	Type	Value	Description
0	Output Record Type	CHAR	31h	GSOF Message Type
1	Record Length	CHAR	104	Length of this sub record starting from byte# 2
2-3	GPS Week	SHORT		GPS week number since Jan 1980
4-7	GPS Time	ULONG		GPS Time in msec of current week.
8	IMU Alignment Status	CHAR	0 - GPS Only 1 – Coarse leveling 2 - Degraded 3 - Aligned 4 - Full Nav	INS quality infdicator
9	GNSS Status	CHAR	0 - Fix not available 1 - GNSS SPS Mode 2 - Differential GPS, SPS 3 - GNSS PPS Mode 4 – Fixed RTK Mode 5 - Float RTK. 6 – DR Mode	GNSS Quality Indicator
10-17	Latitude	DOUBLE	(-90,90]	degrees
18-25	Longitude	DOUBLE	(-180,180]	degrees
26-33	Altitude	DOUBLE	(,)	meters
34-37	North Velocity	FLOAT	(,)	meters/sec
38-41	East Velocity	FLOAT	(,)	meters/sec
42-45	Down Velocity	FLOAT	(,)	meters/sec
46-49	Total Speed	FLOAT	(,)	meters/sec
50-57	Roll	DOUBLE	(-180,180]	degrees
58-65	Pitch	DOUBLE	(-180,180]	degrees
66-73	Heading	DOUBLE	[0,360)	degrees
74-81	Track Angle	DOUBLE	[0,360)	degrees
82-85	Angular Rate (X)	FLOAT	(,)	degrees/sec Longitudinal axis
86-89	Angular Rate (Y)	FLOAT	(,)	degrees/sec Transverse axis
90-93	Angular Rate (Z)	FLOAT	(,)	degrees/sec Down axis

94-97	Acceleration (X)	FLOAT	(,)	meters/sec^2 Longitudinal axis
98-101	Acceleration (Y)	FLOAT	(,)	meters/sec^2 Transverse axis
102-105	Acceleration (Z)	FLOAT	(,)	meters/sec^2 Down axis

GSOF 50 (32H) INS Integrated Navigation Solution RMS:

Table 7: GSOF 50 (32H)

Byte #	Item	Type	Value	Description
0	Output Record Type	CHAR	32h	GSOF Message Type
1	Record Length	CHAR	44	Length of this sub record starting from Byte# 2
2-3	GPS Week	SHORT		GPS week number since Jan 1980
4-7	GPS Time	ULONG		GPS Time in msec of current week.
8	IMU Alignment Status	CHAR	0 - GPS Only 1 – Coarse leveling 2 - Degraded 3 - Aligned 4 - Full Nav	INS quality indicator
9	GNSS Status	CHAR	0 - Fix not available 1 - GNSS SPS Mode 2 - Differential GPS, SPS 3 - GNSS PPS Mode 4 – Fixed RTK Mode 5 - Float RTK. 6 – DR Mode	GNSS Quality Indicator
10-13	North Position RMS	FLOAT	(0,)	meters
14-17	East Position RMS	FLOAT	(0,)	meters
18-21	Down Position RMS	FLOAT	(0,)	meters
22-25	North Velocity RMS	FLOAT	(0,)	meters/sec
26-29	East Velocity RMS	FLOAT	(0,)	meters/sec

30-33	Down Velocity RMS	FLOAT	(0,)	meters/sec
34-37	Roll RMS	FLOAT	(0,)	degrees
38-41	Pitch RMS	FLOAT	(0,)	degrees
42-45	Heading RMS	FLOAT	(0,)	degrees

GSOF 51 (33H) Event Marker Information:

Table 8: GSOF 51 (33H)

Byte #	Item	Type	Value	Description
0	Output Record Type	CHAR	33h	GSOF Message Type
1	Record Length	CHAR	15	Length of this sub record starting from Byte# 2
2	Event Port	CHAR	1 or 2	Event In port associated with captured pulse
3-4	GPS Week Number	ULONG		GPS week number since Jan 1980
5-12	Event Time	DOUBLE		GPS Time of event occurrence in seconds of current GPS week
13-16	Event Number	ULONG	[1, 65535]	Event mark number

GSOF 59 and 60 (3bH and 3cH)) Event Triggered Navigation Information:

Table 9: GSOF 51 (33H)

Byte #	Item	Type	Value	Description
0	Output Record Type	CHAR	59 or 60	GSOF Message Type
1	Record Length	CHAR	108	Length of this sub record starting from byte# 2
2	Event Port	CHAR	1- Event 1 2-Event 2	
3-4	GPS Week	SHORT		GPS week number since Jan 1980
5-8	Event nav time of validity	ULONG	Registered Event time + shift	GPS Time in msec of current week.
9-12	Event Counter	ULONG		Event Mark number
13	IMU	CHAR	0 - GPS Only	INS quality indicator

	Alignment Status		1 – Coarse leveling 2 - Degraded 3 - Aligned 4 - Full Nav	
14	GNSS Status	CHAR	0 - Fix not available 1 - GNSS SPS Mode 2 - Differential GPS, SPS 3 - GNSS PPS Mode 4 – Fixed RTK Mode 5 - Float RTK. 6 – DR Mode	GNSS Quality Indicator
15-22	Latitude	DOUBLE	(-90,90]	degrees
23-30	Longitude	DOUBLE	(-180,180]	degrees
31-38	Altitude	DOUBLE	(,)	meters
39-42	North Velocity	FLOAT	(,)	meters/sec
43-46	East Velocity	FLOAT	(,)	meters/sec
47-50	Down Velocity	FLOAT	(,)	meters/sec
51-54	Total Speed	FLOAT	(,)	meters/sec
55-62	Roll	DOUBLE	(-180,180]	degrees
63-70	Pitch	DOUBLE	(-180,180]	degrees
71-78	Heading	DOUBLE	[0,360)	degrees
79-86	Track Angle	DOUBLE	[0,360)	degrees
87-90	Angular Rate (X)	FLOAT	(,)	degrees/sec Longitudinal axis
91-94	Angular Rate (Y)	FLOAT	(,)	degrees/sec Transverse axis
95-98	Angular Rate (Z)	FLOAT	(,)	degrees/sec Down axis
99-102	Acceleration (X)	FLOAT	(,)	meters/sec^2 Longitudinal axis
102-105	Acceleration (Y)	FLOAT	(,)	meters/sec^2 Transverse axis
106-109	Acceleration (Z)	FLOAT	(,)	meters/sec^2 Down axis

6. Technical Support

If you have any problem and cannot find information you are looking for, please contact your regional Applanix support office.

https://www.applanix.com/contact.htm#support