

NAVIPAC

TOPCON GPS RECEIVER

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Version: 4.2

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1 General guidelines

Uses the NP telegram.

Topcon GPS 1	31	Topcon NP format or standard GGA telegram.
Topcon GPS 2	32	
Topcon GPS 3	33	
Topcon GPS 4	34	

Figure 1 Extract from NaviPac Data Formats manual

Sample:

NP0B3,NAVPOS,V,090822.00,0,RR,{07,03},W84,N55o25'34.476398",E013o49'19.208529",
+00050.2177,V,+039.5165,0.98,1.28,0.009,0.011,0.2313,-
0.0334,199.570,N,000.000,0.123,0.160,100.00,001,@6E

NP0B3,NAVPOS,V,090822.50,0,RR,{07,03},W84,N55o25'34.475778",E013o49'19.207933",
+00050.2119,V,+039.5165,0.98,1.28,0.009,0.011,0.1719,-
0.0326,207.699,N,000.000,0.121,0.158,100.00,001,@D4

NP0B3,NAVPOS,V,090823.00,0,RR,{07,03},W84,N55o25'34.475479",E013o49'19.207372",
+00050.2100,V,+039.5165,0.98,1.28,0.009,0.011,0.0833,+0.0203,262.907,N,000.000,0.123
,0.160,100.00,001,@60

NaviPac interpretation: N/A item is not used

Field	Topcon format	Sample	NaviPac variable
1	Header 0	NP0B3	
2	Message title	NAVPOS	
3	UTC Time indicator	V	String ignored if not 'V'
4	UTC Time	090822.00	Can be used for timestamp and held in UTC field
5	Pos computation indicator	0	String ignored if not '0'
6	Position mode	R	RFC: RTK D: Differential else: Stand alone
7	Velocity mode	R	N/A
8	Number of GPS satellites	{07	NoSat
9	Number of Glonass satellites	03}	NoRef ¹
10	Reference datum	W84	N/A
11	Latitude	N55o25'34.476398"	Lat
12	Longitude	E013o49'19.208529"	Long
13	Altitude	+00050.2177	Antenna H
14	Geoidal separation indicator	V	Next field ignored if not 'V'
15	Geoidal separation	+039.5165	Added to Antenna H
16	HDOP	0.98	HDOP
17	VDOP	1.28	VDOP ²
18	Horizontal RMS error	0.009	ExtRel ³
19	Vertical RMS value	0.011	UnitV ⁴
20	Horizontal velocity	.2313	N/A
21	Vertical velocity	-0.0334	N/A
22	True heading	199.570	N/A
23	Magnetic heading indicator	N	N/A
24	Magnetic heading	000.000	N/A
25	Horizontal velocity RMS error	0.123	N/A

¹ NoRef is for other receivers giving the number of reference stations. Field is re-used here to fit Topcon into general structure

² PDOP is calculated as $\sqrt{\text{HDOP}^2 + \text{VDOP}^2}$

³ ExtRel is for other receivers holding the external reliability value

⁴ UnitV is for other receivers holding the unit variance value

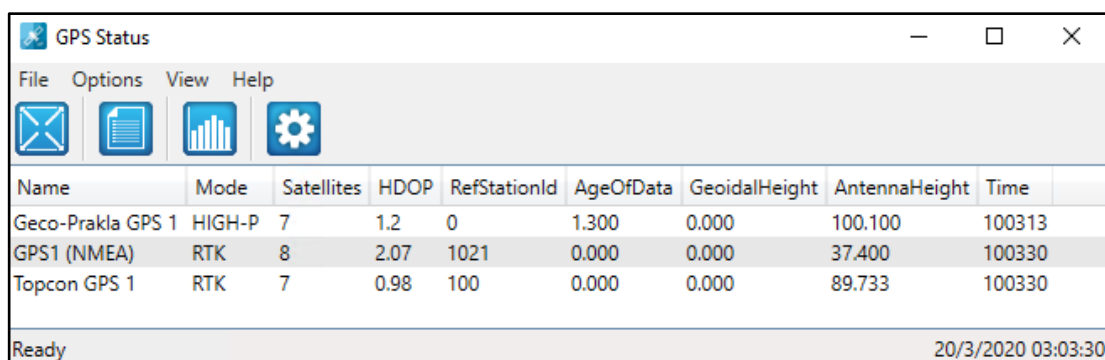
⁵ Dif Id hold identification of reference station for other receivers

26	Vertical velocity RMS error	0.160	N/A
27	Data link quality	100	Dif Id ⁵

Table 1 TOPCON Navpos message

2 Data display samples

Open the **GPS Status** view from **NaviPac Online** to display the data.



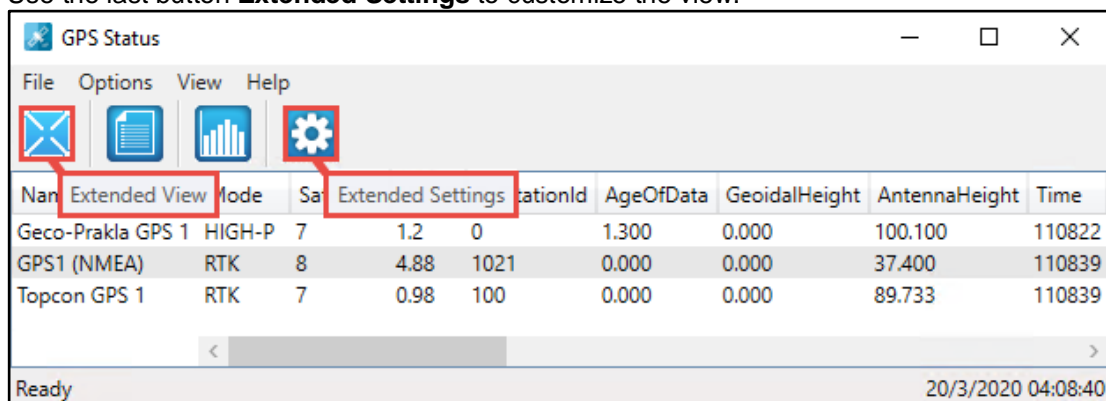
Name	Mode	Satellites	HDOP	RefStationId	AgeOfData	GeoidalHeight	AntennaHeight	Time
Geco-Prakla GPS 1	HIGH-P	7	1.2	0	1.300	0.000	100.100	100313
GPS1 (NMEA)	RTK	8	2.07	1021	0.000	0.000	37.400	100330
Topcon GPS 1	RTK	7	0.98	100	0.000	0.000	89.733	100330

Ready 20/3/2020 03:03:30

Figure 2 Standard view

Note, that you can use the **Standard View** or the **Extended View**.

The first button in the **GPS Status** menu bar enables the **Extended View**.
Use the last button **Extended Settings** to customize the view.



Name	Mode	Sa	Extended Settings	ationId	AgeOfData	GeoidalHeight	AntennaHeight	Time
Geco-Prakla GPS 1	HIGH-P	7		1.2 0	1.300	0.000	100.100	110822
GPS1 (NMEA)	RTK	8		4.88 1021	0.000	0.000	37.400	110839
Topcon GPS 1	RTK	7		0.98 100	0.000	0.000	89.733	110839

Ready 20/3/2020 04:08:40

Figure 3 Extended view

3 Data logging

The GPS status data is logged in the **General**- and NaviEdit(**Survey**) **logging format** – note that 31 identify the first Topcon receiver – the others will be 32-34.

3.1 General format

```
R31 0 2020:03:20:04:28:42.407 NP0B3,NAVPOS,V,112842.11,0,RR,{07,03},W84,N56o
9'3.662165",E010o13'51.408914",+00050.2162,V,+039.5165,0.98,1.28,0.009,0.011,0.1013,
+0.1060,234.470,N,000.000,0.123,0.160,100.00,001,@50 /R31
```

```
S 31 2020:03:20:04:37:14.233 7 0.98 89.73 1.28 1.61 0.00 0.00 0.00 0.00
0.00 0.00 0.01 0.01 1.00 3 3 (0) 56.15099936444 10.23094408556 0
```

3.2 Survey format

```
S; 31; 2004:05:21:12:36:18.341; 7; 0.98; 89.73; 1.28; 1.61; 0.00; 0.00; 0.00; 0.00;
0.00; 0.00; 0.01; 0.01; 1.00; 3; 0; 56.844122565; 9.015997294; 0
```

```
S; 31; 2020:03:20:04:37:10.242; 7; 0.98; 89.73; 1.28; 1.61; 0.00; 0.00; 0.00; 0.00;
0.00; 0.00; 0.01; 0.01; 1.00; 3; 3 (0); 56.15099579167; 10.23094352556; 0
```

4 Version descriptions

Version	Date	Author	Description
3.10	19-12-2019	OKR	Updated
4.2	20-03-2020	ANS	Updated