



# Is my X91+ Tracking Galileo? Carlson SurvCE does not show any SVs!

Date: 3 March 2017

In SurvCE Monitor Skyplot, Galileo SV's are not correctly displayed, even though the receiver is tracking and using them.

An example is shown below. (Note: these screen shots were acquired on our test bench which is under a GPS retransmitter which does not forward L2. It is sufficient for this example, don't get sidetracked with L2 details.)

Here is what the receiver is actually tracking:

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← → ↻ ⓘ 192.168.100.110

[Google](#)
[RPLS Today Communi](#)
[Google Maps](#)
[PLSS Corner Manager](#)
[Trimble](#)
[iG PDG Commerce](#)

## Satellites - Tracking Information ?

**Receiver Status**

**Satellites**

- General
- Tracking (Table)
- Tracking (Graph)
- Tracking (SkyPlot)
- Enable/Disable
- Satellite Almanacs
- Predicted Elevation
- Predicted Constellation
- Current Constellation
- Ground Track
- Rise/Set (Table)
- Rise/Set (Graph)
- Satellite Data

**Receiver Configuration**

**I/O Configuration**

**Network Configuration**

**Security**

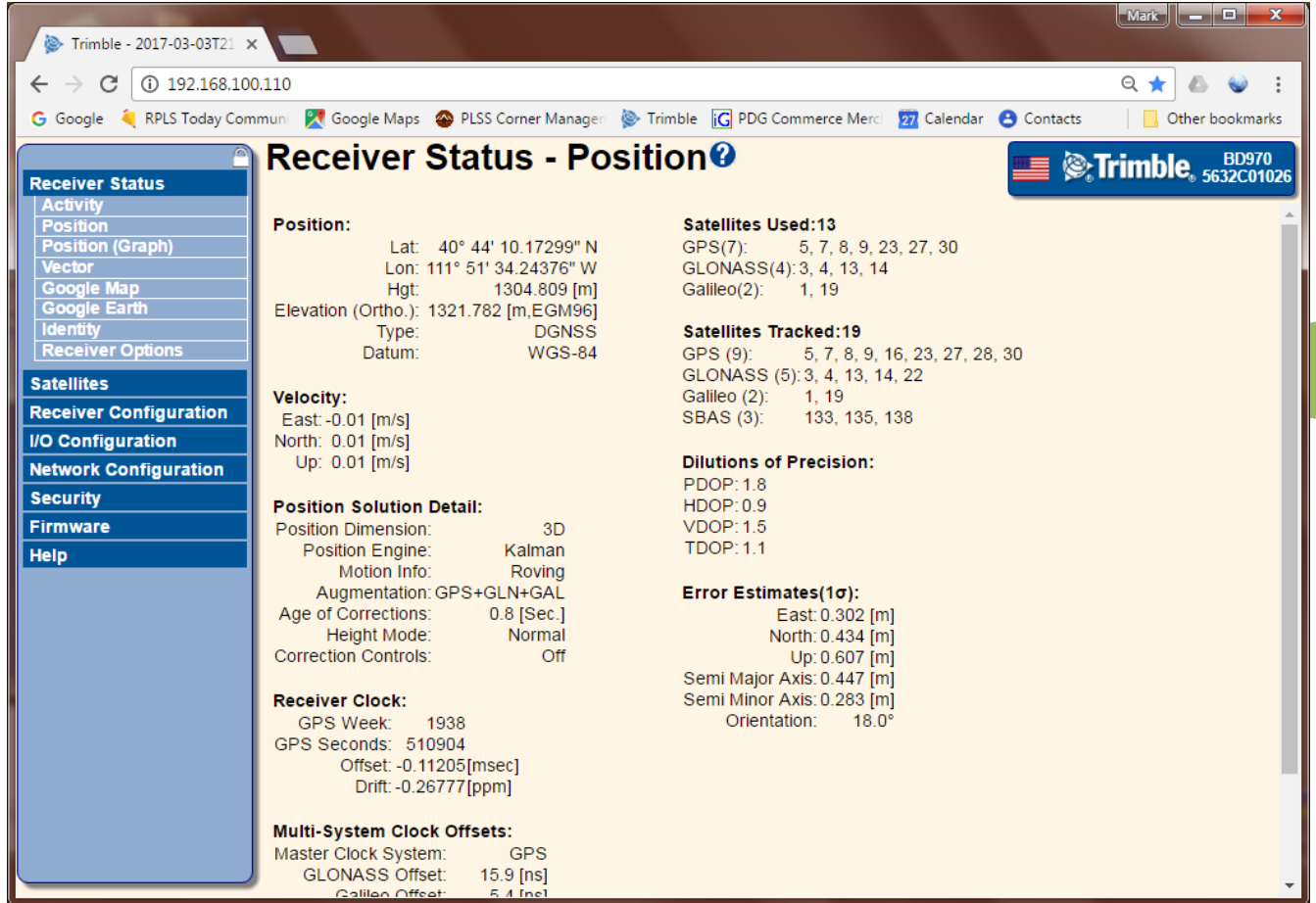
**Firmware**

**Help**

SV	Type	Elev. [Deg]	Azim. [Deg]	L1-C/No [dBHz]	L1	L2-C/No [dBHz]	L2	IODE	URA [m]	Type
5	GPS	11.50	317.96	43.0	CA	-	-	81	2	IIR-M
7	GPS	64.15	317.54	49.7	CA	19.6	E	69	2	IIR-M
8	GPS	37.81	122.87	41.2	CA	-	-	90	2	IIF
9	GPS	80.38	196.82	48.8	CA	21.1	E	3	2	IIF
16	GPS	19.95	44.89	28.6	CA	-	-	76	2	IIR
23	GPS	43.13	146.15	46.1	CA	-	-	57	2	IIR
27	GPS	34.70	74.52	46.8	CA	-	-	7	2	IIF
28	GPS	15.10	221.56	32.9	CA	-	-	22	2.8	IIR
30	GPS	30.44	283.01	44.1	CA	-	-	56	2	IIF
1	Galileo	34.27	260.28	42.7	CBOC	-	-	-	-	-
19	Galileo	59.24	239.14	43.6	CBOC	-	-	-	-	-
22	Galileo	1.38	26.24	-	-	-	-	-	-	-
2	GLONASS	4.41	175.11	-	-	-	-	-	-	-
3	GLONASS	46.64	208.67	33.5/30.1	CA/P	29.8	CA	3	2.5	M
4	GLONASS	48.43	300.74	35.7/34.0	CA/P	-	-	3	7	M
5	GLONASS	7.97	335.48	-	-	-	-	-	-	-
12	GLONASS	7.99	61.60	-	-	-	-	-	-	-
13	GLONASS	53.59	21.24	32.8/32.8	CA/P	29.4	CA	3	4	M
14	GLONASS	43.01	283.90	31.3/31.2	CA/P	-	-	3	10	M
15	GLONASS	9.53	260.78	-	-	-	-	-	-	-
22	GLONASS	17.88	41.66	29.9/-	CA/-	-	-	3	4	M
23	GLONASS	21.29	100.03	-	-	-	-	-	-	-
24	GLONASS	2.82	142.48	-	-	-	-	-	-	-
133	SBAS	42.50	158.60	41.2	CA	-	-	151	4096	-
135	SBAS	38.19	210.69	43.9	CA	-	-	241	2	-
138	SBAS	42.69	173.02	45.2	CA	-	-	45	2	-

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And here is the 'in use' report:



**Receiver Status - Position**

Activity  
Position  
Position (Graph)  
Vector  
Google Map  
Google Earth  
Identity  
Receiver Options

Satellites  
Receiver Configuration  
I/O Configuration  
Network Configuration  
Security  
Firmware  
Help

**Position:**  
 Lat: 40° 44' 10.17299" N  
 Lon: 111° 51' 34.24376" W  
 Hgt: 1304.809 [m]  
 Elevation (Ortho.): 1321.782 [m, EGM96]  
 Type: DGNS  
 Datum: WGS-84

**Satellites Used: 13**  
 GPS (7): 5, 7, 8, 9, 23, 27, 30  
 GLONASS (4): 3, 4, 13, 14  
 Galileo (2): 1, 19

**Satellites Tracked: 19**  
 GPS (9): 5, 7, 8, 9, 16, 23, 27, 28, 30  
 GLONASS (5): 3, 4, 13, 14, 22  
 Galileo (2): 1, 19  
 SBAS (3): 133, 135, 138

**Velocity:**  
 East: -0.01 [m/s]  
 North: 0.01 [m/s]  
 Up: 0.01 [m/s]

**Position Solution Detail:**  
 Position Dimension: 3D  
 Position Engine: Kalman  
 Motion Info: Roving  
 Augmentation: GPS+GLN+GAL  
 Age of Corrections: 0.8 [Sec.]  
 Height Mode: Normal  
 Correction Controls: Off

**Receiver Clock:**  
 GPS Week: 1938  
 GPS Seconds: 510904  
 Offset: -0.11205[msec]  
 Drift: -0.26777[ppm]


**Multi-System Clock Offsets:**  
 Master Clock System: GPS  
 GLONASS Offset: 15.9 [ns]  
 Galileo Offset: 5.4 [ns]

**Dilutions of Precision:**  
 PDOP: 1.8  
 HDOP: 0.9  
 VDOP: 1.5  
 TDOP: 1.1

**Error Estimates(1σ):**  
 East: 0.302 [m]  
 North: 0.434 [m]  
 Up: 0.607 [m]  
 Semi Major Axis: 0.447 [m]  
 Semi Minor Axis: 0.283 [m]  
 Orientation: 18.0°

Note that there are 13 SVs used out of 19 SV's tracked.

The SV list in SurvCE won't fit on one page, so I have combined them below:

Monitor/Skyplot 				
Quality	Position	SATView	SATInfo	Ref
PRN	AZI	ELV	S/N L1:L2	
G9	190	79 <	48:19	
G7	322	65 >	49:19	
C219	236	58 <	44:31	
R50	24	52 <	33:19	
R41	298	49 >	36:31	
R51	286	44 <	33:19	
R40	208	44 <	33:31	
S138	174	43 <	45:31	
S133	158	43 >	41:31	
G23	148	41 <	44:0	
G8	122	39 >	42:19	
S135	210	38 >	43:20	
G27	72	35 <	45:19	
C201	262	35 >	44:20	
G30	284	31 >	44:19	
G16	46	19 <	32:19	
R59	40	18 >	31:19	
G28	222	16 >	31:19	
G5	316	12 <	43:19	

Carlson is reporting the two Galileo SV's as BDS/Compas/Chinese ('C') SV's! The numbering adds 200 to the true SV number:

- GAL 1            displayed as 'C201'
- GAL 19        displayed as 'C219'



If there were any BDS SV's in the sky, they too are shown as 'C', but they have the true number.

I have been complaining about this driver issue (it is in the SurvCE code base) for quite some time, but it does not affect the operation of the system so it is not high on my list of bug fixes.

So, the bottom line is: Any 'C' SV higher than 200 is actually a GAL SV.