



# How to configure EGNOS on your mapping/GIS receiver: step-by-step guide

## ESSP

# Who we are - ESSP

# Who we are

## European Satellite Services Provider



To deliver EGNOS augmentation services 24/7



To operate and maintain EGNOS system



To promote EGNOS and its applications



To support and to interface with users



To monitor & analyse EGNOS performance



To support in the development of EGNOS-based applications



What we offer?

Free GPS augmentation

# What we offer

## EGNOS: Free GPS augmentation

system



**EGNOS:**

- The European Satellite Based Augmentation System
- Provides GPS corrections
- Broadcasts from GEO satellites

since 2009



**SATELLITE based corrections**

- Free of charge
- Sub-metre positioning accuracy
- Real time
- Throughout Europe

# Satellite based corrections: Why choosing EGNOS OS?



EGNOS reaches  
sub metre  
accuracy in real  
time with  
negligible  
convergence time\*

EGNOS is free  
No radio-base  
installation  
No subscription  
Global coverage

\* in comparison with PPP/RTK

## EGNOS added value in:

Agriculture  
General mapping and basis-  
accuracy cartography  
GIS mapping/surveying  
Large amount of points to be  
referenced  
Inventories over wide areas  
(roads, natural parks,  
municipalities)  
Archeological works  
Fauna and botanical species  
catalogues

# How to configure your GPS/SBAS receiver: step-by-step guide for selected receivers

# What is a GPS/SBAS receiver?

A GPS/SBAS receiver is a GPS receiver that locks onto the EGNOS satellites and apply the EGNOS corrections to the GPS signal.

## Manufacturers:



ESSP-MOM-18930





# Example#1: Trimble R1 + ArcGIS collector



Model

Sub-metre accuracy

Trimble R1 Receiver + ArcGIS collector

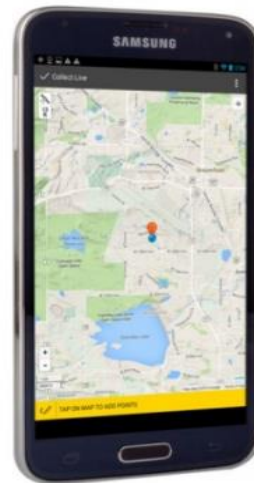
Capabilities

GNSS single frequency (L1):

- GPS, Glonass, BeiDou, Galileo, QZSS

SBAS corrections supported:

- WAAS, **EGNOS**, GAGAN, MSAS, SDCM

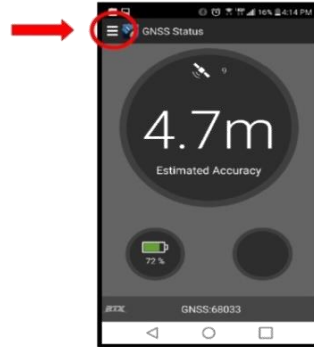


This receiver connects wirelessly to a smart device via Bluetooth connectivity.

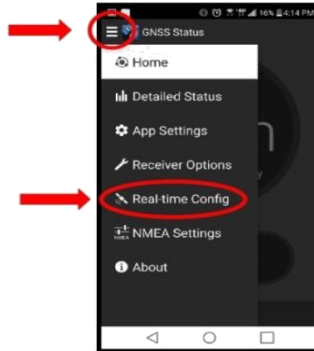
# Example#1: Trimble R1 + ArcGIS collector

## How to configure EGNOS OS (1/2)

1. Once the App is connected to the R1 receiver, you are taken to the GNSS Status Home Screen.



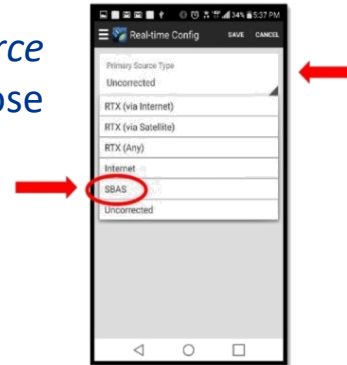
2. Tap the Menu button, and choose "Real-Time Config"



3. On Real-time Config tap "Edit" at the top right of the screen.



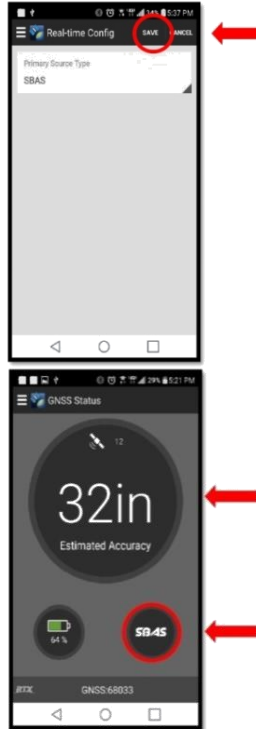
4. Tap the *Primary Source Type* field. Choose **SBAS**.



# Example#1: Trimble R1 + ArcGIS collector

## How to configure EGNOS OS (2/2)

5. Tap “Save”. Then tap the Menu button and return to the Home Screen.
6. Once GNSS Status app is connected to R1 Receiver and **SBAS** service in use, you will have the word “SBAS” at the bottom right-hand circle and the **Estimated Accuracy** will drop to < 1m.



7. Tap home button on your device to minimize the GNSS Status (It stays running) then open the Collector App. The location Collector in use is now coming from the R1 Receiver vs the mobile device internal receiver.



# Example#2: Leica Zeno FLX100



**Model** **Sub-metre accuracy**

Zeno FLX100

## Capabilities

### GNSS multifrequency (L1, L2):

- GPS, Glonass, BeiDou, Galileo, QZSS

### SBAS corrections supported:

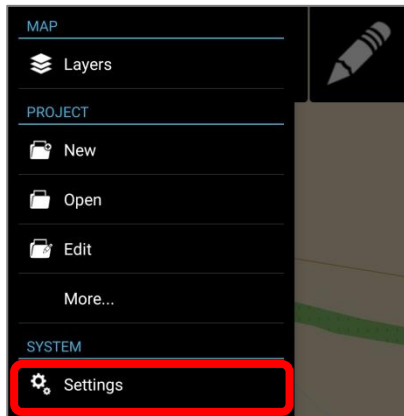
- WAAS, **EGNOS**, GAGAN, MSAS, SDCM



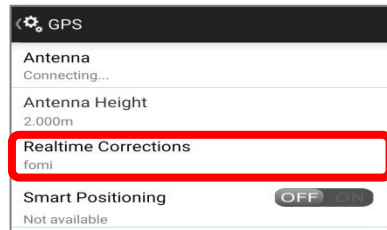
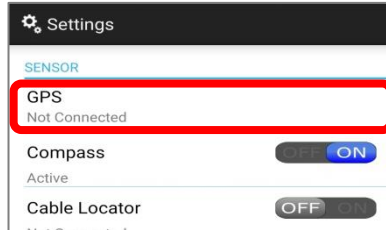
# Example#2: Leica Zeno FLX100

## How to configure EGNOS OS

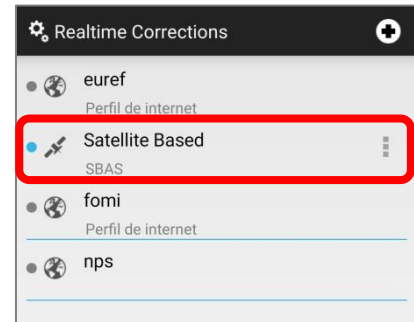
1. Once the antenna is connected via Bluetooth, open *Settings* menu on *Zeno Mobile* (\*).



2. Select *GPS* and then tap on *Realtime corrections*.



3. Select “SBAS” in *Real-time Corrections*. The blue dot indicates SBAS corrections are active.



(\*) Configuration can be done with *Zeno Mobile* or *Zeno Connect*. See [Example#3](#).

# Example#3: Leica Zeno GG04 Plus



**Model**

**Sub-metre accuracy**

**Zeno GG04 Plus.**

## Capabilities

### GNSS multifrequency:

- GPS (L1/L2/L5), Glonass (G1/G2/G3), BeiDou (B1/B2/B3), Galileo (E1/E5a/E5b/AltBOC/E6), QZSS, NavIC (IRNSS, L5)

### SBAS corrections supported:

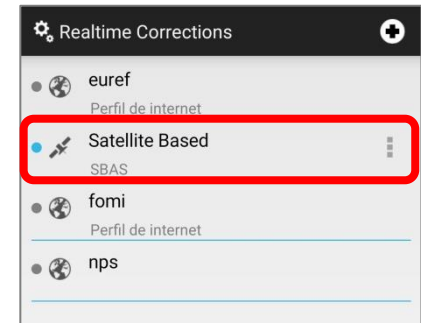
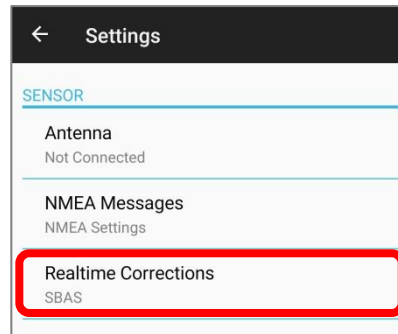
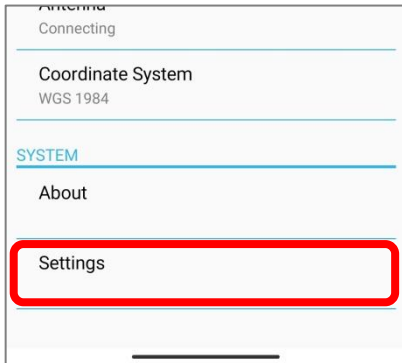
- WAAS, **EGNOS**, GAGAN, MSAS



# Example#3: Leica Zeno GG04 Plus

## How to configure EGNOS OS

1. Once the antenna is connected via Bluetooth, open *Settings* menu on *Zeno Connect* (\*).
2. Select *directly Realtime corrections*.
3. Select “SBAS” in *Realtime Corrections*. The blue dot indicates SBAS corrections are active.



(\*) Configuration can be done with *Zeno Mobile* or *Zeno Connect*. See [Example#2](#).

# Example#4: NavCom SF-3050



## Model

Sub-metre accuracy

Model: SF-3050

## Capabilities

### GNSS:

- GPS (L1/L2/L5), GLONASS (G1/G2), QZSS, StarFire

### SBAS corrections supported:

- WAAS, **EGNOS**, GAGAN, MSAS





# Example#4: NavCom SF-3050

## How to configure EGNOS OS

1. *Navigation Modes* provides access to settings for RTCM, SBAS and StarFire.

Activate **SBAS**.

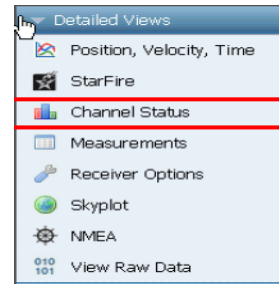
SET NAVIGATION MODES		CURRENT NAVIGATION SETTING
RTCM Code:	On	ON
SBAS:	On	ON
StarFire:	On Internal	ON, INTERNAL
Apply Navigation Settings to the Receiver		

2. *Sky Plot* displays tracked satellite locations and provides an interface to select constellations. Each satellite is displayed by color and PRN: GPS=Green, GLONASS=Grey, <sup>1</sup>SBAS=Orange.



<sup>1</sup>Go to [Egnos User support](#) to confirm active EGNOS PRN Geos

3. The SF-3050 receiver locates and tracks **SBAS** satellites at run-time, building a list of satellites that contribute to navigation solution.



CHNL STATUS10 - GPS Constellation																										
PRN	AZ	EL	CH (L1CA)	ST	C/N0	CR	AL	TM	CH (L1P1)	ST	C/N0	CR	AL	TM	CH (L2)	ST	C/N0	CR	AL	TM	CH (L2C)	ST	C/N0	CR	AL	TM
1	282	51	8	LOCK	52.25	1	N	3	8	LOCK	51	0.94	N	3	9	CONV	47.75	0.99	N	3	-	-	-	-	-	-
11	245	41	4	LOCK	52.25	0.99	N	3	4	LOCK	51	0.89	N	3	5	CONV	46	1	N	3	-	-	-	-	-	-
14	52	26	10	LOCK	46	0.97	N	3	10	LOCK	44.5	0.75	N	3	11	CONV	40.75	1	N	3	-	-	-	-	-	-
20	310	29	14	LOCK	49	1	N	3	14	LOCK	48	0.8	N	3	15	CONV	42	0.98	N	3	-	-	-	-	-	-
22	111	22	16	LOCK	49.25	0.97	N	3	16	LOCK	48.5	0.95	N	3	17	CONV	44	1	N	3	-	-	-	-	-	-
23	260	15	6	LOCK	46.75	0.99	N	3	6	LOCK	44.25	0.83	N	3	7	CONV	41.25	0.97	N	3	-	-	-	-	-	-
25	59	10	18	LOCK	42.25	1	N	3	18	LOCK	39.25	0.41	N	3	19	CONV	37	0.9	N	3	-	-	-	-	-	-
30	140	13	20	LOCK	46	0.97	N	3	20	LOCK	45	0.75	N	3	21	CONV	39.25	0.92	N	3	-	-	-	-	-	-
31	109	17	0	LOCK	54.25	1	N	3	0	LOCK	53.25	0.92	N	3	1	CONV	50	0.99	N	3	-	-	-	-	-	-
32	325	54	2	LOCK	51.5	1	N	3	2	LOCK	50.25	0.91	N	3	3	CONV	46.25	0.96	N	3	-	-	-	-	-	-

CHNL STATUS1B - GLONASS Constellation																										
PRN	AZ	EL	CH (G1C)	ST	C/N0	CR	AL	TM	CH (G2C)	ST	C/N0	CR	AL	TM	CH (G5P)	ST	C/N0	CR	AL	TM	CH (G2P)	ST	C/N0	CR	AL	TM
1	16	55	25	LOCK	52	0.98	N	3	40	LOCK	36	0.99	N	3	-	-	-	-	-	-	-	-	-	-	-	-
2	313	21	26	LOCK	47.75	0.99	N	3	41	LOCK	33.75	1	N	3	-	-	-	-	-	-	-	-	-	-	-	-
10	31	22	29	LOCK	47	0.98	N	3	30	LOCK	30.75	0.99	N	3	-	-	-	-	-	-	-	-	-	-	-	-
11	66	64	33	LOCK	51.75	0.99	N	3	42	LOCK	37	0.99	N	3	-	-	-	-	-	-	-	-	-	-	-	-
12	176	34	24	LOCK	51.5	1	N	3	43	LOCK	41.5	0.99	N	3	-	-	-	-	-	-	-	-	-	-	-	-
17	294	17	31	LOCK	45.5	0.99	N	3	27	LOCK	35.75	0.98	N	3	-	-	-	-	-	-	-	-	-	-	-	-
24	240	14	38	LOCK	45	0.98	N	3	39	LOCK	36	0.99	N	3	-	-	-	-	-	-	-	-	-	-	-	-

CHNL STATUS1B - SBAS Constellation																										
PRN	AZ	EL	CH (L1CA)	ST	C/N0	CR	AL	TM	CH (L1P1)	ST	C/N0	CR	AL	TM	CH (L2)	ST	C/N0	CR	AL	TM	CH (L2C)	ST	C/N0	CR	AL	TM
135	205	47	49	LOCK	53.25	0.99	N	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
138	160	48	50	LOCK	52.75	0.95	N	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

# Example#5: Hemisphere R330



Model

Sub-metre accuracy

R330

## Capabilities

### GNSS double frequency:

- GPS (L1/L2), GLONASS, BeiDou, Galileo and Atlas

### SBAS corrections supported (3 channels):

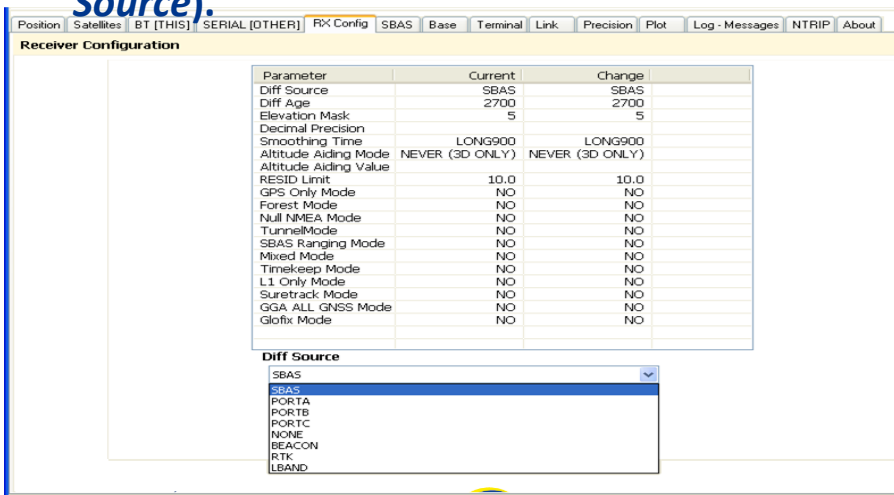
- WAAS, **EGNOS**, GAGAN, MSAS



# Example#5: Hemisphere R330

## How to configure EGNOS OS

1. Use **PocketMax™** to Communicate with the R330™. On *RX Config* page of receiver configuration software select **SBAS** as **Differential corrections source (Diff Source)**.



2. Also, When you power on the R330™ the Hemisphere GNSS **splash screen** appears. On Top menu Press the **Down Arrow** button to display the remaining items on the **Top menu** (see at bottom right) and select **Differential**.



# Example#6: Hemisphere R632



Model

Sub-metre accuracy

R632

## Capabilities

### GNSS double frequency:

- GPS (L1/L2), GLONASS, Beidou, Galileo IRNSS, QZSS, Atlas

### SBAS corrections supported (3 channels):

- WAAS, **EGNOS**, GAGAN, MSAS
- Wi-Fi & Bluetooth features



# Example#6: Hemisphere R632

## How to configure EGNOS OS

1. Create a **Wi-Fi connection** (no password needed) to the receiver and open the user IP port **192.168.0.68**

### R632 Reference Station

Summary	
System Information	
System Information	
GPS Status	
Satellites	
Data Transmission	
Data Recording	
Configuration	
Reference Station	
GNSS Configuration	
Tracking Satellites	
Heading	
Network	
Dynamic DNS	
Ntrip Server	
Recording	
Port Configuration	
Alerts	
SNMPD	
Firewall	

Local Time	2022-01-27 09:44:42 (GPS Time + 1)
Satellites	8
Longitude	-3°27' 8.76131"
Latitude	40°28' 21.59425"
Height	661.275 m
Status	DGNSS [4 Sec.]
PDOP	2.349
HDOP	1.343
HRMS	0.403
VRMS	0.578

Station Number	0111
Base Longitude	113°21' 59.82440"
Base Latitude	23° 7' 35.67690"
Base Height	0 m

MET Type	ZZ11A
Pressure	- hPa
Temperature	- °C
Humidity	- %RH

GNSS Configuration	
Cutoff Angle	5
1PPS	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
BDS	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
GPS	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
GLONASS	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Galileo	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
QZSS	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
SBAS	<input checked="" type="radio"/> Enable <input type="radio"/> Disable

3. Use **Ports configuration**. Choose any COM port and configure it as needed. Also configure the NMEA and rate as indicated below:

Ports Summary :						
Port	Status	Baud Rate	Protocol	Mode	IP Port	Function
Bluetooth	Enable	-	-	-	-	CMD
UHF	Disable	440.125 MHz	South 9800	-	-	RTK_OUT
COM1	Disable	115200	RS485	-	-	CMD
COM2	Disable	115200	RS485	-	-	CMD
COM3	Enable	115200	RS232	-	-	DEBUG
Ntrip Client	Disable	-	NTRIP	CLUE	-	-
Ntrip Caster	Disable	-	NTRIP	CAS1	-	-
Socket 1	Enable	-	TCP	SERVER	-	-
Socket 2	Disable	-	TCP	SERVER	-	-
Socket 3	Disable	-	TCP	SERVER	-	-
Socket 4	Disable	-	TCP	SERVER	-	-
Socket 5	Disable	-	TCP	SERVER	-	-

I/O Configuration :	
Socket 1	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Type	TCP
Mode	Server
Port	6060
Function	NMEA(Output)
NMEA	GGA: 1HZ GSA: 1HZ GSV: 1HZ ZDA: 1HZ
Record	RMC: 1HZ VTG: 1HZ GST: 1HZ GLL: 1HZ
	<input type="radio"/> Enable <input checked="" type="radio"/> Disable

2. Go to **GNSS configuration** and enable GPS and SBAS. Include also the **cut off angle**

# Example#7: Vector VR1000



Model

Sub-metre accuracy

VR1000

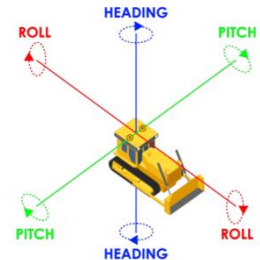
## Capabilities

### GNSS double frequency:

- GPS (L1/L2), GLONASS, BeiDou, Galileo, QZSS, IRNSS, and Atlas

### SBAS corrections supported (3 channels):

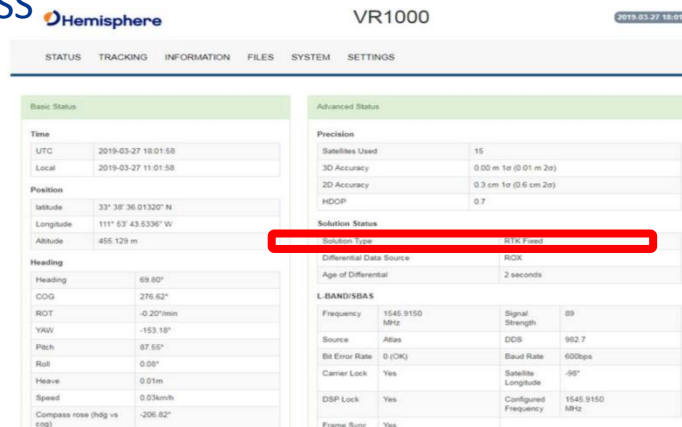
- WAAS, **EGNOS**, GAGAN, MSAS



# Example#7: Vector VR1000

## How to configure EGNOS OS

1. Open a web browser window and type the following IP address: 192.168.100.1
2. Go to setting and enable SBAS
3. In 3D accuracy will show the horizontal error using EGNOS and in Solution Type will indicate 3D fixed DGNSS
4. Also the VR 1000 has Led's to inform the GNSS type and quality



Indicator	Description/Function
Power	Solid GREEN indicates receiver is powered on
Primary GNSS	Solid GREEN indicates tracking 4+ satellites Solid RED indicates No Satellites
Secondary GNSS	Solid GREEN indicates tracking 4+ satellites Solid RED indicates No Satellites
Heading	Solid GREEN indicates 2D GNSS heading Solid AMBER indicates 2D sensor heading
Quality	Solid GREEN indicates RTK fixed Flashing GREEN (1/sec) indicates DGPS / Float Solid AMBER indicates Autonomous Flashing AMBER indicates No Position Solid RED indicates No Satellites

# Example#8: Sx Blue II / iSXblue II

The logo for SXblue, featuring the text "SXblue" in white on a dark blue background with a subtle star pattern.

**Model**

**Sub-metre accuracy**

**SXblue II / iSXblue II**

**Capabilities**

**GNSS double frequency:**

- GPS (L1), GLONASS and Beidou

**SBAS corrections supported (3 channels):**

- WAAS, **EGNOS**, GAGAN, MSAS





# Example#8: SX Blue

## How to configure EGNOS OS

1. Use **SXBlue config™ Windows, Android or IOS** to Communicate with the **SxBlue™** receiver.
2. Select **SBAS** differential.
3. Set the baud rate of the serial port RS-232 or the USB port (Bluetooth baud rate is fixed).
4. Choose the **NMEA** data <sup>2</sup>messages and the **update rate** to output at each of the ports (1s rate or less is advised).
5. Set the maximum differential **age cut-off** (60s).
6. Setting the satellite elevation angle **cut-off mask** (5 degrees).

<sup>2</sup>Minimum recommended NMEA labels: GGA, ZDA, GSA, GSV, GLL & RMC

7. Receiver will first **lock to GPS** and turn LED to green.
8. When **SBAS is locked** the LED will turn to orange.



# Example#9: Ublox



## Model

## Sub-metre accuracy

M6, M8, M9, M10, MVK##

## Capabilities

### GNSS double frequency:

- GPS (L1/L2)

### SBAS corrections supported (3 channels):

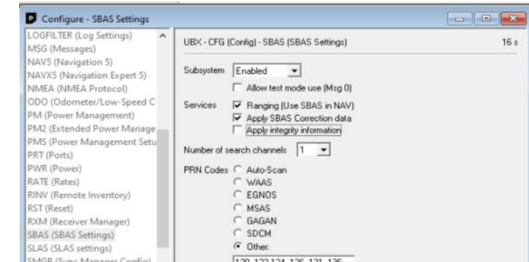
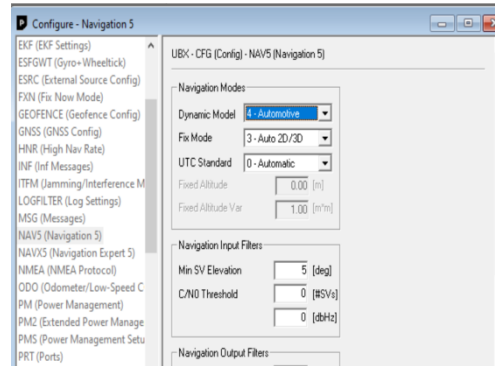
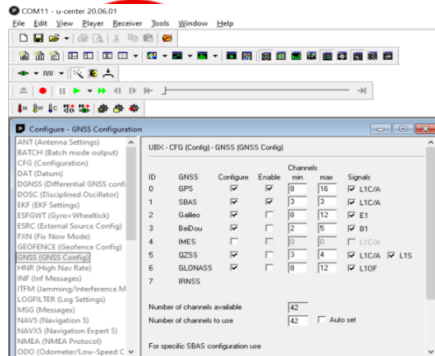
- WAAS, **EGNOS**, GAGAN, MSAS



# Example#9: Ublox

## How to configure EGNOS OS

1. After the connection using <sup>3</sup>U-Center, on the quick icon menu select: **Configuration > GNSS Config**. Then select **GPS** and **SBAS**. The quantity of channels (**GPS min 8 max 16. SBAS min & max 3**). Press **SEND**.
2. On the main menu select: **Configuration > NAV5**. Then at the **Dynamic Model** select **PEDESTRIAN** or **AUTOMOTIVE** (if walking or using a vehicle to do mapping/surveying). Press **SEND**.
3. On the main menu select: **Configuration > SBAS**. Then select **ENABLED** in the **Subsystem**, **Apply SBAS Correction data** and the **PRN codes** select **OTHER**: introduce the current GEO numbers: 123, 136 (see [operational GEOs](#)). Press **SEND**.
4. Ublox is ready to use EGNOS signal. It will indicate 3D/DGNSS.



<sup>3</sup> [U-center from Ublox](#). Free receiver software

# Example#10: Septentrio



septentrio



Construction



Mining



Large Robotics

## Model

Sub-metre accuracy

AsteRx SB3, AsteRx SB3 Pro, PolaRx5, PolaRx5e, AsteRx

## Capabilities

GNSS double frequency:

- GPS (L1/L2)

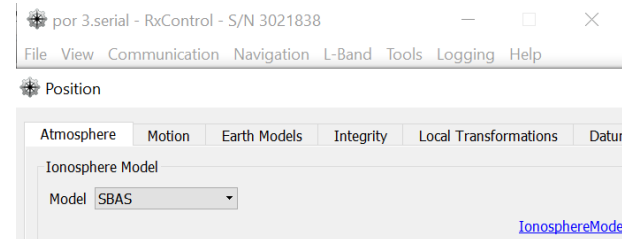
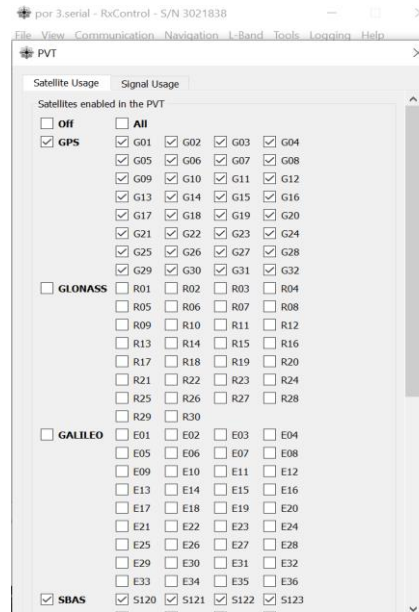
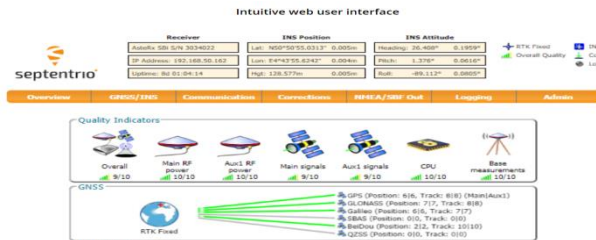
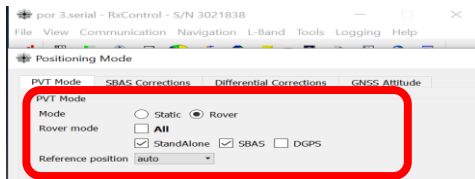
SBAS corrections supported (3 channels):

- WAAS, **EGNOS**, GAGAN, MSAS



# Example#10: Septentrio How to configure EGNOS OS

1. Open the Rx control software. After connection, on the main menu select: **Navigation > Positioning** then select **GPS and SBAS**. Accept.
2. Also, the Intuitive web user interface can be used to configure SBAS
3. On the Rx control main menu select: **Navigation > Advance user settings > PVT** and select **GPS and SBAS**



4. Then select: **Navigation > Position** and configure the receiver to use **SBAS iono model**, as well as **heavy machinery vehicle, or pedestrian, etc.**
5. Septentrio is ready to work using EGNOS signal.

# Example#11: SP20

**SPECTRA**<sup>®</sup>  
GEOSPATIAL

**Model**

**Sub-metre accuracy**

**SP-20**

**Capabilities**

- GPS (L1/L2), GLONASS, GALILEO, Beidou
- **SBAS corrections supported (3 channels):**
- WAAS, **EGNOS**, GAGAN, MSAS
- Android OS
- Portable



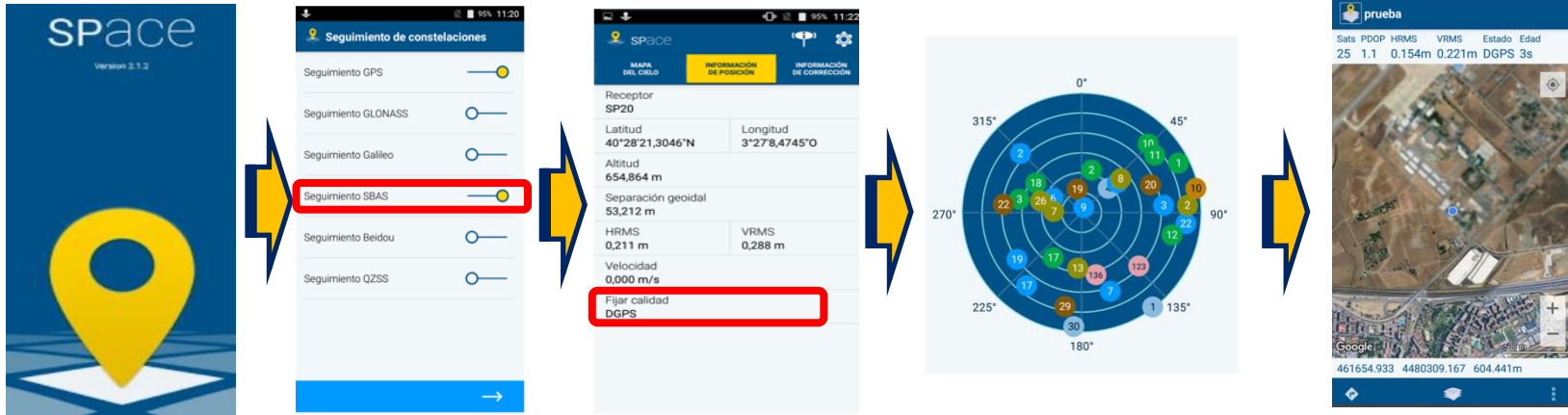
**SCALABLE ACCURACY**  
**SUBMETRIC**

# Example#11: SP20

## How to configure EGNOS OS

1. Turn on the device. Open **SPACE** app.
2. In **Settings** select **Tracking**.
3. Enable **GPS** and **SBAS**.
4. Exit and select (in main menu) **Position Information** label.  
**HRMS** will drop below 0.40m and will show **DGPS**.

5. Also, current satellite information is shown.
6. The device can be used for mapping/surveying or other soil application that meets the submetric level.



# Summary



# Summary

## How to access to EGNOS corrections for geomatics:

To use EGNOS signal the receiver must be GPS/SBAS capable

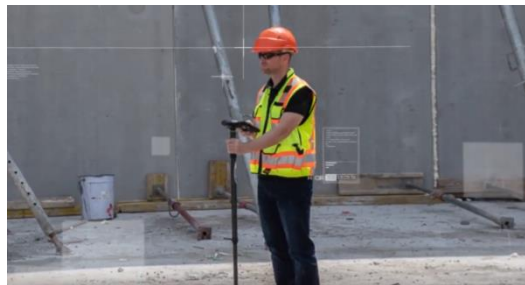
A wide variety of manufacturers offers GPS/EGNOS capable receivers

GPS/SBAS receivers are easily configured through the display. No registration is needed as EGNOS signal is ready to use. Check PRN codes broadcasting EGNOS operational signal and/or contact EGNOS user support [in this link](#)

# Summary

**EGNOS & EDAS<sup>1</sup> provide free GPS Augmentation corrections for geomatics:**

**EGNOS OS is a free of charge real time SATELLITE based correction service enhancing GPS for geomatics throughout Europe**



The EGNOS Data Access Service (EDAS) offers ground-based access to EGNOS data through the Internet

[https://egnos-user-support.essp-sas.eu/new\\_egnos\\_ops/services/about-edas](https://egnos-user-support.essp-sas.eu/new_egnos_ops/services/about-edas)

# Useful information about EGNOS

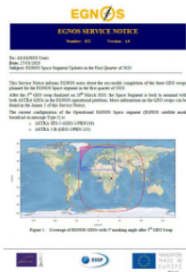
<https://egnos-user-support.essp-sas.eu>

## EGNOS SIS availability forecast

( JANUARY 2022 )

M	T	W	T	F	S	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

Planned Signal Available  
Planned Signal Outage  
Risk of Signal Outage  
Signal Availability to be confirmed



## Service Notice #22 EGNOS Space Segment Updates in the First Quarter of 2020 - (In Force)

Service Notices | Friday, March 27, 2020

The EGNOS Service Notices are notifications published whenever there is any complementary information that could have a relevant impact in any of the EGNOS Service Definition Documents' contents. Hence, an EGNOS Service Notice is a temporal amendment to the EGNOS Service Definition Documents.

[service\\_notice\\_22.pdf](#)

## DOCUMENTS RESOURCES & TOOLS

### LIBRARY

### SDD

### SERVICE IMPLEMENTATION ROADMAPS

### MONTHLY PERFORMANCE REPORTS

### SERVICE NOTICES

### YEARLY REPORTS

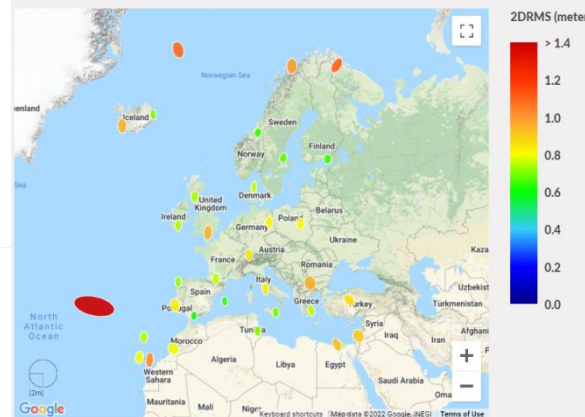
### BROCHURES

### SUCCESS STORIES



## ACCURACY FOR SURVEYING

Map PRN 136 Table Mode



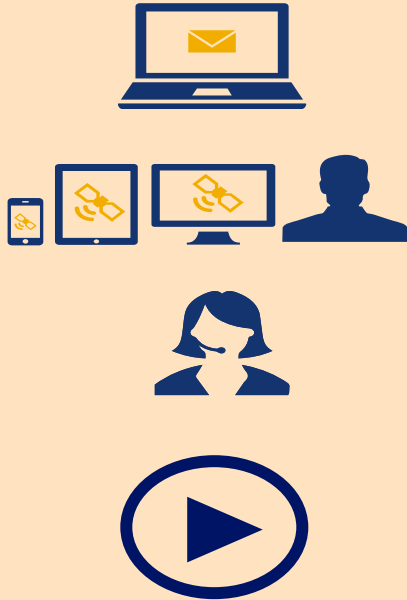
# Disclaimer

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[https://egnos-user-support.essp-sas.eu/new\\_egnos\\_ops/helpdesk](https://egnos-user-support.essp-sas.eu/new_egnos_ops/helpdesk)

[egnos-helpdesk@essp-sas.eu](mailto:egnos-helpdesk@essp-sas.eu)

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Corporate Video

# Thank you!