

EKINOX AHRS & INS

Product Change Notice

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Doc. Type	PCN: New Ekinox series hardware revision	SBG Systems	3bis, chemin de la Jonchère 92500 Rueil-Malmaison - FRANCE

This notice is to inform you about a major Ekinox series hardware update, providing performance improvements, while maintaining compatibility with existing Ekinox product line.

1. Description of change

1.1. New Inertial Measurement Unit

The most important update in the Ekinox 2 is the inertial measurement unit change. Leveraging on MEMS technology and an innovative proprietary integration, the EKINOX 2 IMU delivers an exceptional performance level while maintaining a constant price level.

1.1.1. New gyroscope

Key gyro improvements and changes are listed here:

- Greatly reduced noise level and bias instability (4x improvement)
 - Noise level: $0,14^{\circ}/\sqrt{h}$
 - Bias instability down to $0.8^{\circ}/h$
- New sensor range
 - G4 (+/- $300^{\circ}/s$)

1.1.2. New accelerometer

The accelerometer embedded inside the Ekinox 2 has been drastically improved, providing a quartz performance level while being based on silicon technology. Key improvements / changes are listed below:

- New sensor ranges – dedicated to specific markets requirements
 - A2 (+/- 8g) for marine applications
 - A3 (+/- 14g) for all other applications
- Improved robustness against vibrations; in particular for marine applications
 - 3-4g RMS for the A2 option,
 - >8g RMS for the A3 option.
- Noise and bias instability improvements
 - Noise down to $7 \mu g/\sqrt{hz}$ on A2 range and $30 \mu g/\sqrt{hz}$ on A3 range
 - Bias instability: $2 \mu g$ on A2 range and $10 \mu g$ on A3 range

1.2. Obsolete magnetometers

Due to the difficulty to maintain very high accuracy using magnetic sensors (accuracy limited by many environmental factors), the internal magnetometer is no longer supported on the Ekinox series.

For Ekinox customers that were using magnetometers, we now recommend the use of the new Ellipse series instead. Ellipse 2 product line provides yet an excellent performance on roll and pitch angles, and still embeds a magnetometer, at a very low price level.

1.3. New GNSS receiver

The new Ekinox series (N & D models) integrates a new survey grade, dual frequency GNSS receiver. Its main features are described as follows:

- 120 channels
 - GPS / QZSS L1, L2, L2C
 - GLONASS L1, L2
 - BeiDou B1, B2
 - Galileo E1, E5b
- 5Hz output rate
- Dual frequency, Dual antenna heading capable

1.4. Improved orientation performance

Thanks to the improved IMU performance, the Ekinox 2 orientation performance is upgraded:

Application	Condition	Roll / Pitch	Yaw
Land vehicle	SP	0.03°	0.08°
	RTK	0.02°	0.06°
	PPK	0.015°	0.03°
Air / Marine	SP + Baseline > 2m	0.03°	0.08°
	RTK + Baseline > 2m	0.02°	0.08°
	RTK + Baseline > 4m	0.02°	0.05°
	PPK	0.015°	0.03°

1.5. Form factor changes

In order to provide more features to the customers, and reduce lead time, some form factors have been discontinued:

- EKINOX2-A are now shipped with the three connector form factor (EKINOX-E form factor). This improves the EKINOX2-A communication capabilities (adding extra serial ports), and allows, through a factory return the possibility to upgrade the product to INS capability (conversion to EKINOX2-E).
- EKINOX2-N are now shipped with the same form factor as EKINOX2-D. In case the user want to upgrade to a dual antenna unit (EKINOX2-D), a factory upgrade will be proposed.

2. Impact of change

SBG Systems has taken all actions to ensure a smooth transition for all users.

New hardware revision is highly compatible with existing units, featuring similar form factor and same protocol and communication. Performance parameters are the main items affected by this change.

Some consideration should be taken by former EKINOX-A and EKINOX-N users to verify that the new height of EKINOX2-E and EKINOX2-D will fit into their application.

In addition, users are warned that the currently available firmware (revisions <= 1.4) will not be available on this new hardware. SBG Systems does not expect any significant change to be done on customer side to enable the new hardware revision inside their applications.

2.1. Current hardware EOL announcement

Although SBG Systems strongly recommends to switch to new hardware revision as soon as possible, it is possible to keep ordering V1 hardware units according to the next table details:

Ekinox product code	Hardware revision	Last time buy	Last shipping	Remarks
EKINOX-#-G4A1-PS EKINOX-#-G4A2-PS EKINOX-#-G3A3-PH	1.x	September 30 th , 2017	December 31 st , 2017	After the last time buy date, orders will be automatically acknowledged with the new hardware revision and new product code



Note this EOL has a shorter notice than usually, as the new hardware is Form, Fit and Function compatible with the previous one and therefore does not require specific re-qualification.

2.2. New product codes

In order to easily identify the new hardware revision, and allow a smooth transition for customers, a new ordering product code has been set-up. Sensor options are defined in a similar way as before. A “2” has been added after the EKINOX code to identify new hardware. Finally GNSS options have been added at the end of the product code to identify the different GNSS options enabled in the product.

Ekinox product code	Hardware rev.	Ekinox 2 equivalent product code	Hardware rev.
EKINOX-[A E]-G4A1-PS	1.x	EKINOX2-[A E]-G4A2	2.0
EKINOX-[A E]-G4A2-PS	1.x	EKINOX2-[A E]-G4A3	2.0
EKINOX-[A E]-G4A3-PH	1.x	EKINOX2-[A E]-G4A3	2.0
EKINOX-[N D]-G4A1-PS	1.x	EKINOX2-[N D]-G4A2-####	2.0
EKINOX-[N D]-G4A2-PS	1.x	EKINOX2-[N D]-G4A3-####	2.0
EKINOX-[N D]-G4A3-PH	1.x	EKINOX2-[N D]-G4A3-####	2.0
EKINOX-M-G4A1-PS-EL	1.x	EKINOX2-M-G4A2-EL	2.0
EKINOX-U-G4A1-PS-EL	1.x	EKINOX2-U-G4A2-EL	2.0
EKINOX-M-G4A1-PS-ED	1.x	EKINOX2-M-G4A2-ED	2.0
EKINOX-U-G4A1-PS-ED	1.x	EKINOX2-U-G4A2-ED	2.0

2.2.1. EKINOX2-N & EKINOX2-D GNSS options integrated in the product code

With previous EKINOX hardware, GNSS options were ordered as separated lines. Now, the EKINOX2-D product code directly integrates the GNSS options using a four letters code, as defined in the following matrix:

Constellation	Signals			Positioning	Options		
GPS+GLONASS	B	L1/L2	1	Standalone+DGPS	S	N/A	A
GPS+GLONASS+GALILEO	E			RTK	V	RAW Data	B
GPS+GLONASS+BEIDOU	F						

For instance: EKINOX2-D-G4A2-**B1VB** provides GPS+GLONASS, L1/L2 tracking, with RTK and raw data support.

2.3. New hardware availability

First deliveries of EKINOX2 are expected Q2 2017.

3. Contact

If you need any further information after reading this document, please contact us by email or phone.

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