# Ellipse AHRS & INS

## Product change Notice

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| **Document** | PCNELI2 | **Support** | support@sbg-systems.com |
| **Date** | Jan 9, 2017 | | +33 1 80 88 45 00 |
| **Doc. Type** | PCN: New Ellipse series hardware revision | | **SBG Systems**<br>3bis, chemin de la Jonchère<br>92500 Rueil-Malmaison - FRANCE |

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

**Note this is a preliminary PCN version. All information contained in this document, and in particular the delivery schedule, are subject to change without notice.**

# 1. Description of change

Major changes are listed below.

## 1.1. New accelerometer

The new accelerometer embedded inside the Ellipse provides superior performance level. Following changes have been implemented:

- Improved Long term bias stability: The new accelerometer offers excellent long term stability; This will provide better performance after long periods of sensor storage. This also allows easier OEM integration as the new system is less subject to bias drift in case of humid / high temperature environments.
- Reduced Short term bias instability and noise level. These two parameters improvements will provide superior performance:
  - Roll & pitch error at 0.1° RMS for all units,
  - Heave error at 5cm / 5% RMS, up to 15s period.
- Improved VRE (Vibration immunity). New accelerometer allows stronger vibrations to be applied during operation without affecting performance. New operating vibration specification is now:
  - 3g RMS for the A2 option,
  - 8g RMS for the A3 and A4 options.
- New A4 sensor range (+/-40g) available for high range applications

## 1.2. GALILEO support in ELLIPSE-N

A new generation GNSS receiver is also embedded inside the Ellipse-N. This new GNSS receiver enables a full GALILEO constellation support, in addition to the existing GPS, GLONASS and BEIDOU constellations.

All other performance parameters remain similar on this new GNSS receiver.

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## 1.3. New internal magnetometer

Due to previous generation sensor obsolescence, we now integrate a new magnetometer inside the new ELLIPPSE hardware.

The only difference is the sampling rate that is now 100Hz while it was 220Hz in previous generation. Other performance parameters are similar and orientation accuracy should not be affected.

## 1.4. Sensor options changes

### *1.4.1. Obsolescence of Low range gyro options*

Aside from the new hardware revision, SBG Systems has conducted advanced performance tests on the different Gyro ranges. Although it might be counter-intuitive, no performance improvement has been observed on the low ranges G2 (100°/s) and G3 (200°/s) options, when compared to the standard G4 (450°/s) range.

As a consequence, SBG Systems has decided to discontinue the G2 and G3 options, which are now automatically replaced by the standard G4 option. This change brings the advantage of a shorter lead time for all customers with same performance level.

### *1.4.2. 16g range (A3) becomes the new standard*

Thanks to its superior performance compared to all previous Ellipse series versions, the new A3 version (16g range) is now recommended for most applications, and becomes the standard accelerometer option. Most existing customers should now only request for A3 range for optimized lead time and superior vibration performance.

### *1.4.3. New high performance 8g range (A2) for marine applications*

For applications that require maximum heave accuracy, such as Survey, platform monitoring and other marine applications, the new 8g range (A2) accelerometer is recommended. This will enable a 5cm / 5% heave performance.

### *1.4.4. New extended range option G5A4 (1000°/s – 40g) for advanced applications*

For highly dynamic applications, the new G5A4 sensor range can now be offered on special request. This new sensor option provides 1000°/s range on gyro and 40g range for accelerometer.

This range option replaces former G5A3 sensor range.

# 2. Impact of change

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

New hardware revision is 100% form, fit and function compatible with existing Ellipse sensors. Only performance parameters are affected by this change.

However, users are warned that the currently available firmware (revisions < 1.3) 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:

| Ellipse product code | Hardware revision | Last time buy | Last shipping | Remarks |
|---|---|---|---|---|
| ELLIPSE-#-G2A2-###<br>ELLIPSE-#-G3A2-### | 1.x | June 30th, 2016 | N/A | Standard ELLIPSE-#-G4A2-### is now proposed instead. |
| ELLIPSE-A-G#A#-###<br>ELLIPSE-E-G#A#-###<br>ELLIPSE-N-G#A#-###<br>ELLIPSE-D-G#A#-### | 1.x | June 31st, 2017 | Sept 30st, 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. Ordering codes matching

In order to easily identify the new hardware revision, and also allow a smooth transition for customers, a new ordering product code has been set-up. All sensor options are defined in the same way as before and only a "2" has been added after the ELLIPSE code to identify new hardware.

| Ellipse product code | Hardware rev. | Ellipse 2 equivalent product code | Hardware rev. |
|---|---|---|---|
| ELLIPSE-A-G4A#-### | 1.x | **ELLIPSE2**-A-G4A#-### | 2.0 |
| ELLIPSE-E-G4A#-### | 1.x | **ELLIPSE2**-E-G4A#-### | 2.0 |
| ELLIPSE-N-G4A#-### | 1.x | **ELLIPSE2**-N-G4A#-### | 2.0 |
| ELLIPSE-#-G5A3-### | 1.x | **ELLIPSE2**-#-**G5A4**-### | 2.0 |
| ELLIPSE-D-G4A#-### | 1.x | **ELLIPSE2**-D#-G#A#-###-### | 2.0 |

### *2.2.1. Ellipse-D GNSS options integrated inside the product code*

With previous ELLIPSE hardware, GNSS options were ordered as separated lines.
Now, the ELLIPSE2-D product code directly integrates the GNSS options using a four letters code, as defined in the following matrix:

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

For instance: ELLIPSE2-D-G4A2-B1-B1SA provides GPS+GLONASS, L1/L2 tracking, in Standalone/DGPS mode.

## 2.3. New hardware availability

First deliveries of new hardware revision are expected by March 2017.

# 3. Contact

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

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