

Ellipse AHRS & INS

High Performance, Miniature Inertial Sensors

Easy Migration from IG-500



Document
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1. Purpose

The new Ellipse series has been designed as a major product improvement over the previous IG-500 series, and should be considered as a replacement product for the IG-500. While the price is maintained to same level as IG-500, the Ellipse provides the following improvements:

- Low noise gyro for stable outputs
- Much more accurate orientation (0.2° RMS)
- Wider input/output options
- Easier integration in vehicle and for OEM devices
- Much more powerful algorithms (improved Extended Kalman filter)
- Ellipse outputs are backward compatible with IG-500 series (through Legacy mode), and upward compatible with SBG Systems higher grade sensors (Ekinox).

This document explains how to quickly migrate IG-500 applications to the new Ellipse series. Major changes are pointed, as well as specifications that did not change.

2. Product code options equivalence

New sensors and protocol options are now available with the Ellipse series

2.1. Sensor options

The following tables will show sensor options that should be equivalent to previous IG-500 options:

IG-500 Accelerometer option	Ellipse Accelerometer option	Comment
A1 (2g)	A2 (8g)	Equivalent performance as older A1 option with larger range
A2 (5g)	A2 (8g)	-
A3 (18g)	A3 (16g)	-

IG-500 Gyroscope option	Ellipse Gyroscope option	Comment
G2 (75°/s)	G2 (100°/s)	-
G3 (150°/s)	G3 (200°/s)	-
G4 (300°/s) - standard	G4 (450°/s) - standard	-
G5 (600°/s)	G4 (450°/s) or G5 (1000°/s) depending on required range	Check actual requirements
G6 (1200°/s)	G5 (1000°/s)	-

2.2. Packaging and protocol options

IG-500 Protocol and enclosure option	Ellipse Enclosure and interface equivalence	Comment
P1-B (Box, RS-232, without sync) P1-S (Box, RS-232, with sync)	B1 or B2	Equivalent functions with both versions
P2-O (OEM, RS-232)	L1	-
P3-S (Box, CAN)	B2	CAN interface is only used for data output now
P3-O (OEM, CAN)	L2	CAN interface is only used for data output now
P4-S (Box, RS-422)	B1	-
P4-O (OEM, RS-422)	N/A	Not available in standard. Contact SBG Systems

3. Electrical and interface migration

The table below lists the major electrical changes.

Item	IG-500 series specification	Ellipse series Specification	Comment
Input voltage	3.3 to 30V	5 to 36V	Check minimum input voltage
Power consumption (A version)	400mW	300mW	-
Power consumption (N version)	800mW	600mW	-
Power consumption (E version)	650mW	350mW	-
Logic inputs	[-25 / +25V]	[-25 / +25V]	-
Logic outputs type	Open Drain	CMOS, 3.3V	Pull-up resistors must be removed with Ellipse series. Check application compatibility with 3.3V output
GPS/GNSS Antenna requirements	L1 GPS	L1 GPS+GLONASS	Ellipse will continue to work with a GPS only antenna, but will provide better performance with a GPS+GLONASS antenna.

4. Mechanics and connections migration

4.1. Box devices

Ellipse sensors do not share the same mounting holes as the IG-500.

Check application requirements regarding mechanical installation.

Item	IG-500 series specification	Ellipse series Specification	Comment
Dimensions (Box)	36 x 49 x 22 mm 36 x 49 x 25 mm	46 x 45 x 24 mm	IG-500 dimensions for B and S packages. Check larger dimensions
Main connectors	Push Pull Lemo connector (4 or 7 ways)	Fischer UltiMate, 10 ways Connector	New connector must be used for Ellipse connection to host
GPS antenna connector	SMA	SMA	-

4.2. OEM integration

Whereas the IG-500 OEM version was delivered as electronic boards to be assembled by customer, the new Ellipse OEM integration is made easier thanks to a light module design. The module can be mounted directly on the customer application, using a Hirose board to wire connector.

Please check Ellipse OEM Integration Manual for more information about OEM integration.

5. Software migration

5.1. Serial protocols

Inherited from the higher grade Ekinox series, the sbgECom protocol is now the default communication protocol. It is not by itself backward compatible with the previous IG-Devices Serial Protocol.

Thanks to higher evolution capabilities, this new sbgECom is the preferred way to communicate with an Ellipse Sensor. The sbgECom library can be used to facilitate the protocol handling. Its interface is really close to the previous IG-Devices sbgCom library.

All the configuration is now performed through the sbgECom protocol.

5.1.1. Legacy output mode

In order to ease software migration, the Ellipse series includes a legacy output mode that remains compatible with the previous IG-500 series, implementing the IG-Devices Serial Protocol output. Only the SBG_CONTINUOUS_OUTPUT mode is implemented for now.



Note: Legacy mode is not recommended for new designs.

5.2. CAN protocol

Whereas the IG-500 series has implemented a full CAN protocol implementation, covering both configuration and output capabilities, the Ellipse series provides a simpler CAN implementation, with only data output capability. Sensor configuration is always done through the main serial interface.

Obviously, CAN output IDs may be changed by the user as it was possible in the IG-500 series.

Ellipse CAN output protocol is the same as the one used for the Ekinox series. A DBC file is available on demand, as well as protocol specifications.