TOPCON
Agriculture

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This is Topcon

Eye care

Infrastructure

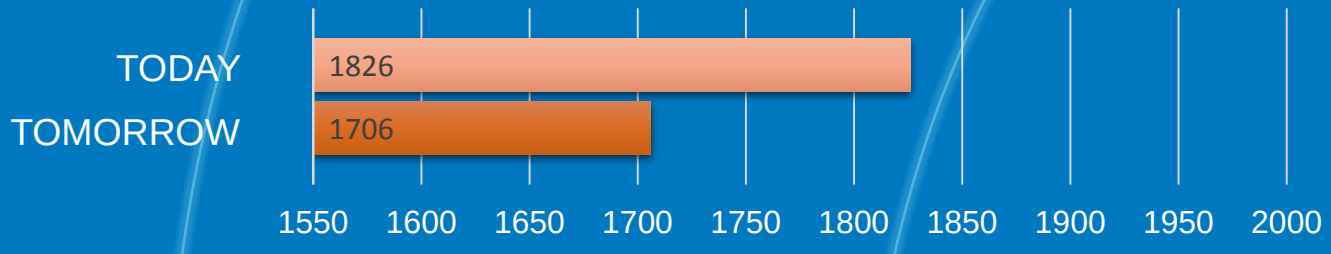
Infrastructure

Geopositioning

Agriculture

Construction

ARABLE LAND (million ha)

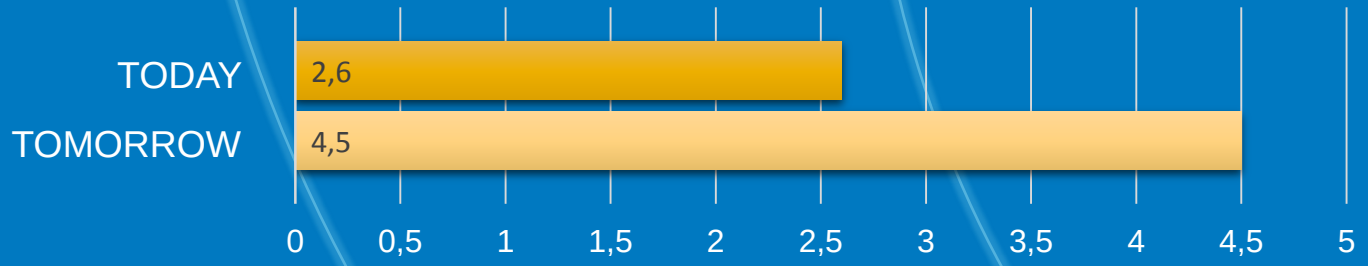


2030

TOMORROW
8.2 Billion people

TODAY
7.5 Billion people

CROP PRODUCTION NEED

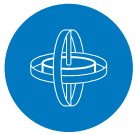


COMPONENTS

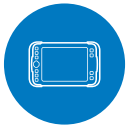
Full access to core technologies, from hardware to software, components to algorithms


GNSS Boards, Receivers & Antennas

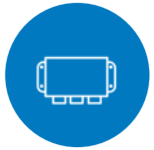

Radios & Communication


IMU


Correction Networks


Rugged Consoles


Display


Control ECUs


Advanced Sensors


Ag Software


Mapping Software


Agronomic Software


Cloud Services


Hyperspectral Analysis


Big Data Analytics

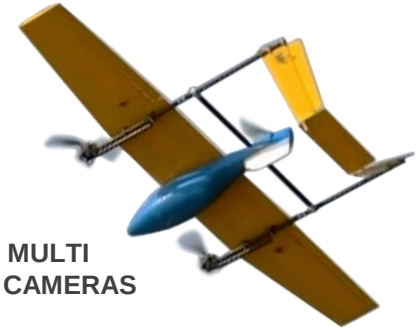

IoT Platform


Own Test Fields

HARDWARE

FULL RANGE

TELEMATICS



UAVS & MULTI SPECTRAL CAMERAS

FULL FEATURED DISPLAYS

NITROGEN SENSORS

GNSS RECEIVERS

ULTRASONIC SENSORS

AUTOSTEERING ECUS

OPTICAL & MOISTURE SENSORS

IMPLEMENT CONTROL ECUs

LOAD CELLS & INDICATORS

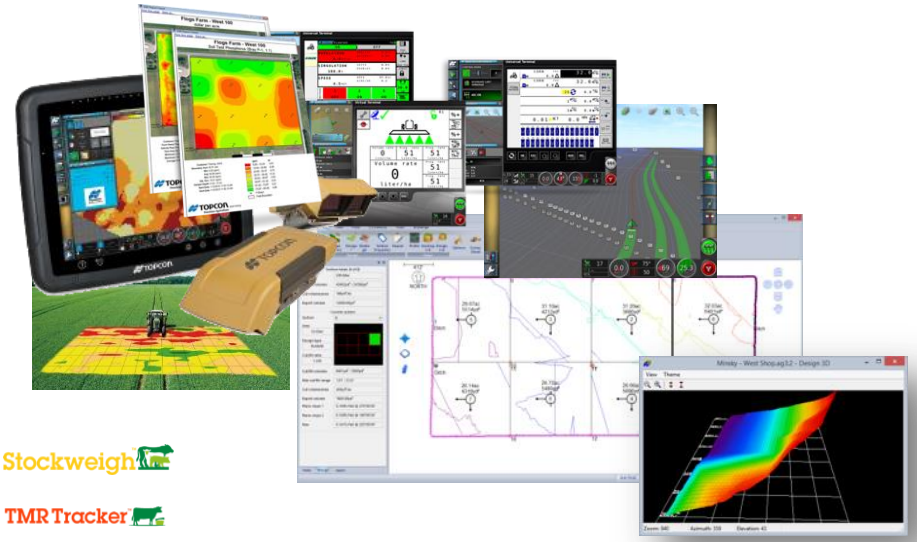
SOFTWARE

FULL RANGE

Sensor & Application

Farm Management

Fleet Management



AND BEYOND…

Data into value at every phase of the farming operation.

EDAS TEST

Autonomous
- GNSS
- +/- 2 m
- Free

EGNOS
- GNSS
- +/- 30 cm
- Free

DGPS
- GPS
- 10> x < 35 cm
- Free

RTK NTRIP
- GNSS
- < 10 cm
- Subscription

RTK
- Radio/SIM
- +/- 2 cm
- Equipment

EDAS FIELD TESTS

ESSP &Topcon made several Test in three locations, in Spain and Portugal, in order to see the real performance of EDAS DGPS signal in real conditions.

Using different locations to determine distance of use. Various tractor models and implement types.

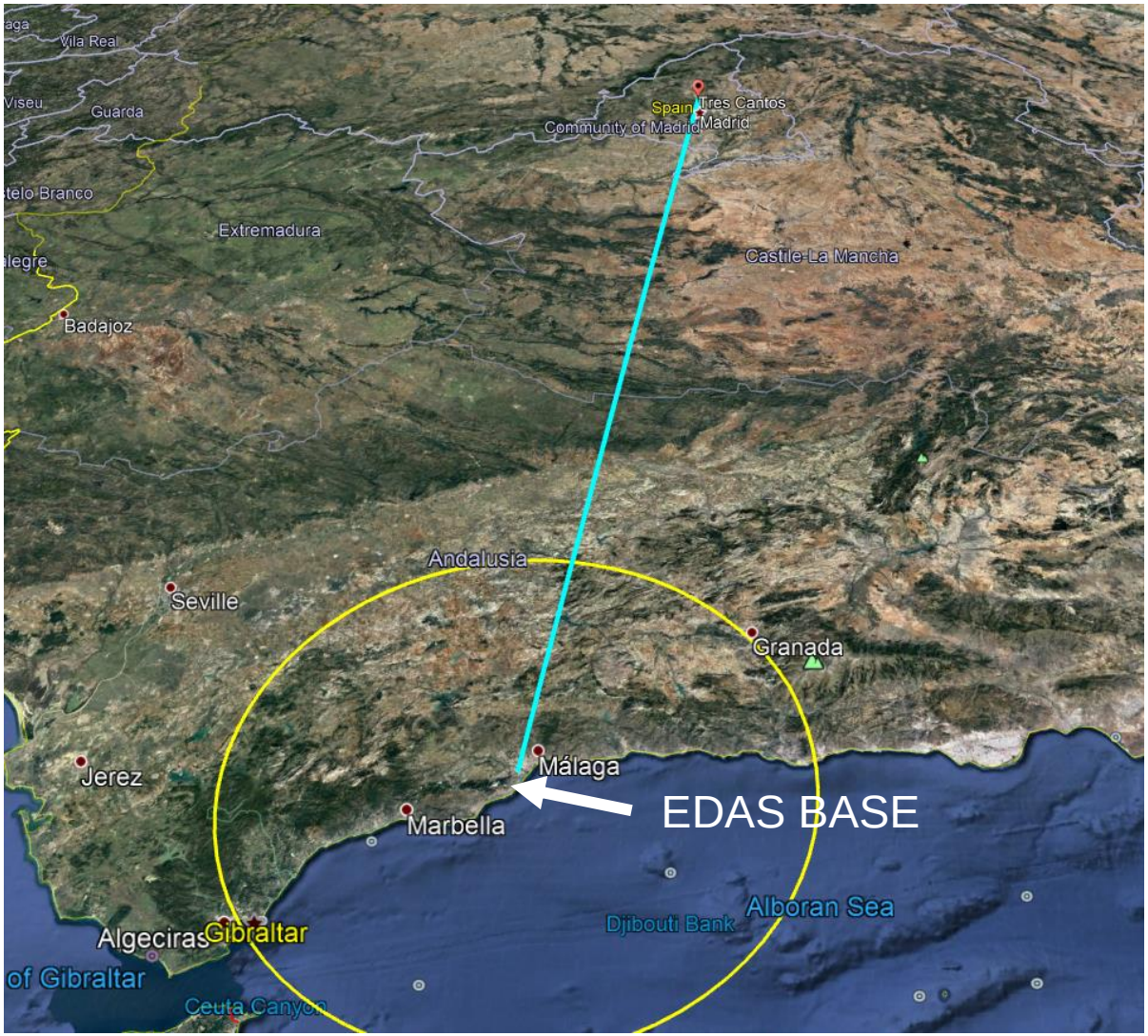
-Long Range

Location Madrid.

EDAS test: 440Kms.

*Target >400 kms.

(beyond expected limits)



Pass to pass Accuracy:

more than 30 cm.

(In some passes 20cm)

Further test must be done in long range distances

-Medium Range

Location: Marchena, Seville.

EDAS test: 111Kms.

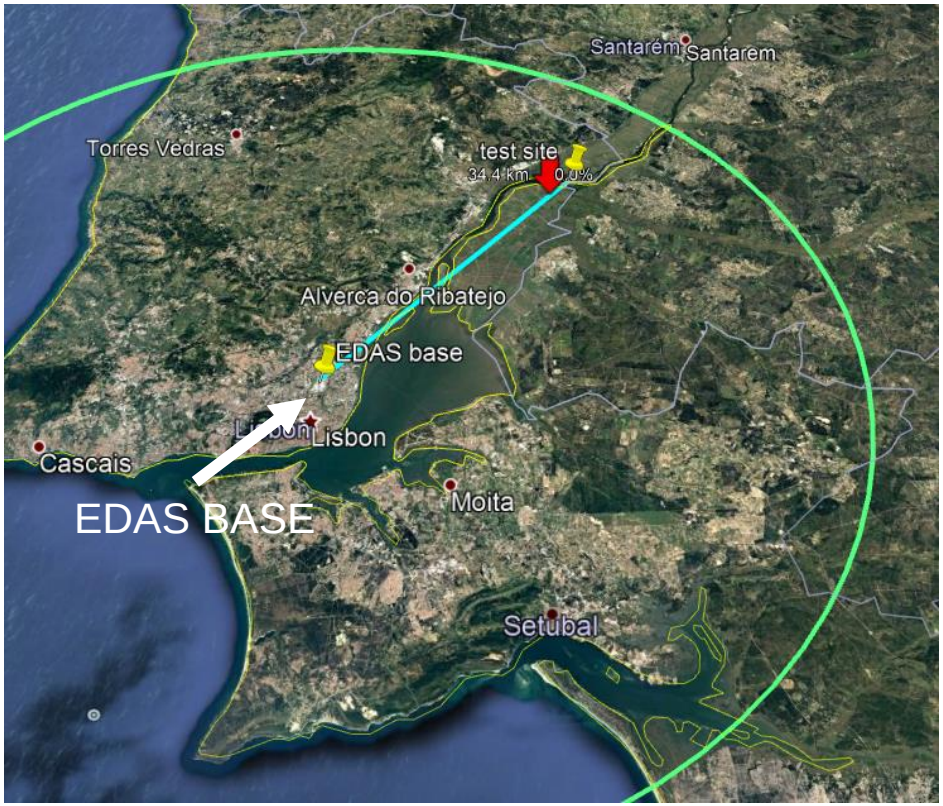
*Target 100Kms.

Pass to pass Accuracy:
around 12 to 22 cm

-Short Range EDAS Test: 34.4Kms.

Location: Azambuja, Lisbon.

*Target 50Kms.



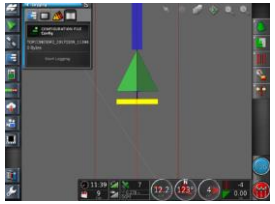
Pass to pass Accuracy:
around 6 to 16 cm

Real Topcon market acquirable systems

Two consoles X35

AES-35 Electric Auto-steering

Topcon RTK Base Hiper V



View from Console

- Use of RTK Base as reference
- Two separate systems
- One at a time: auto guiding the tractor, the other as reference

AGI-4 receiver with radio module

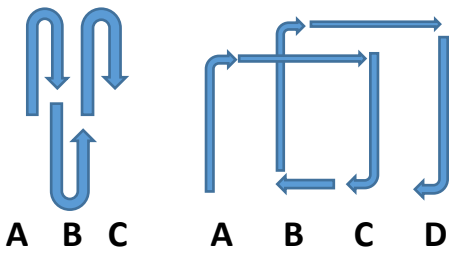
RTK

AGI-4 receiver with 3G modem

EDAS

REAL FIELD TESTS

WORKING PATTERNS



PHYSICAL MEASUREMENT AREA

*ESSP photos

CONCLUSIONS

- The results in medium and short range indicates that EDAS can be used by farmers located less than +/-150 kms around the EGNOS stations.
- Further tests needed to conclude on the maximum baseline.
- EDAS can help all cereal farmers located in the area indicated above.
- Also if the signal is closer than 30Kms it will encourage some crop farmers to use the signal.

- It’s an excellent free service for customers that would like to have an alternative for field work and also a Backup if radio bases are not available or down.

- <u>Target applications:</u>
  - Spraying/Spreading of any crop type.
  - Tilling of cereal
  - Seeding of cereal to be confirmed via more infield tests but likely (Except corn)
  - Harvesting of cereal

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Agriculture