HxGN AgrOn platform


An integrated platform for the intelligent management of agricultural and forestry operations.
HxGN AgrOn platform

Smart Digital Reality in Field.

Hexagon has developed the HxGN AgrOn platform using the most advanced information technologies applied to the entire agricultural and forestry production process for planning, management, monitoring and automation of field operations: from soil preparation to application of cultural practices, passing planning and operationalisation of planting and harvesting, and support operations.

Digital Transformation will be responsible for the separation between successful companies and failed companies. It is no longer a matter of adopting or not adopting technology. It's a matter of choosing the right partner for this adoption.
REASONS TO CHOOSE HEXAGON AS A PARTNER IN YOUR DIGITAL TRANSFORMATION:

**END-TO-END SOLUTION**

We are the only supplier in the market that has a complete solution that covers everything from optimised long-term planning to the automation of operations in the field through displays in a synchronised way to reduce time lost in activities.

**EXPERIENCE IN THE AGRICULTURAL MARKET**

Our team has more than 20 years of experience in the market. We speak the same language as the field, and we know both the problems and solutions to solve them in the most efficient way possible.

**HEXAGON EXPERTISE**

We have all the technologies developed by Hexagon at our disposal, a world leader in digital solutions, enabling us to bring leading innovations from the fields of geo-positioning, mapping, automation, embedded electronics, artificial intelligence and systems integration to the agricultural and forestry sectors.
FIND OUT ABOUT THE HXGN AGRON PORTFOLIOS:

**AgrOn CULTIVATION**
Integrated solutions for crop management, enabling agricultural and forestry companies to optimise resource allocation, increase productivity, reduce inputs and ensure production quality. With modular products, it was created specifically for agricultural producers to maximise operational control and a detailed and accurate view of each stage of cultivation. AgrOn Cultivation has been proven to provide savings and cost reduction in preparation and cultivation operations for agribusiness and forestry companies.

**AgrOn HARVESTING**
Integrated solutions for the management of harvest, transportation and logistics operations, enabling agricultural and forestry companies to optimise the allocation of resources used, reduce raw material losses, synchronise operations and guarantee the quality and profitability of the process. Its modular structure aims to provide customers with a complete logistics management and control solution, both in strategic and field operation. AgrOn Harvesting helps solve the intricacies of harvesting while reducing expenses and the total cost of the operation.
PLANNING & OPTIMISATION

AgrOn Expansion Planning
Planning and optimisation system that takes account of the total cultivation area.
- Enables optimal programming by production environment
- Performs the production projection for the medium/long term
- Base for sizing investment
- Allows the costs of agricultural operations to be scaled
- Exclusive for sugarcane operations
- Product available in the AgrOn Cultivation portfolio

AgrOn Plant Planning
Planning and allocation system for ideal planting.
- Recommends the ideal plantation and cultivation strategy with the lowest costs
- Indication of sugarcane varieties, places and times for planting and expansion of the cultivation area
- Selects ideal varieties to suit the characteristics of each planting site
- Simulates falls and production simulations for the next harvests or cycles
- Product available in the AgrOn Cultivation portfolio

AgrOn Operation Planning
Planning and optimisation system of resources for operations in the field.
- Optimises machines, labour and supplies
- Allows ideal dimensioning for third parties to leverage effectively and meet demands
- Projects and arranges all operations involved in preparation, planting, harvesting and cultivation of production areas for the entire year.
- Projects the zero-based budget of the entire agricultural area
- Integrated with service orders management and provides process updates
- Product available in the AgrOn Cultivation portfolio

AgrOn Logistics Support Planning
Optimisation and coordination system for the production support resources.
- Generates daily itineraries for fleet
- Enables dedicated and optimised models of the convoy, workshop, board and winch truck vehicles
- Reduces the total mileage driven by optimal sequencing of routes
- Increases total availability of production machines
- Controls driver work days in accordance with labour restrictions
- Product available in the AgrOn Cultivation and AgrOn Harvesting portfolios
**AgrOn Harvest Planning**

System that plans and optimises the harvest schedule.

- Defines the ideal harvesting period for all production areas for the entire year
- Maximises the production and total quality of raw material harvested in the field
- Synchronises logistics - taking into account the operational capacity
- Ability to compare scenarios with the generation of different harvest strategies
- Evaluates the costs, bottlenecks and impacts of constraints
- Allows monitoring and reprogramming throughout the year
- Product available in the AgrOn Harvesting portfolio

**Add-on module:**

**AgrOn Harvest Planning | Cutting Scheduler**

- Synchronises the movement of cutting fronts, reduces the total distance moved
- Ensures the fleet stays within parameters for transporting raw material from the field to the industry

**AgrOn Transport Optimisation**

Synchronised system for transport and cutting operations in the field.

- Monitors and controls machines and trucks in real-time
- Provides accurate positioning information for trucks throughout transport cycles
- Decides destination and route of each new trip by applying an optimisation algorithm for dispatches
- Maximises transport capacity while reducing downtime of harvesting resources
- Reduces the risk of industry downtime by ensuring the timely delivery of the scheduled raw material volumes
- Manages and controls eventual occurrences of equipment delays and outages
- Product available in the AgrOn Harvesting portfolio

**AgrOn Haul-Out Dynamic Allocation**

Synchronised system for allocation of haul-out transporter and the cutting pace of harvesters.

- Indicates the ideal moment for moving a haul-out tractor assembly to a harvester
- Considers distances, paths and times of movement on the cutting front
- Increases the total time of operation of harvesters, due to the reduction of the waiting time by available haul-outs
- Exclusive for sugarcane harvesting operations
- Product available in the AgrOn Harvesting portfolio
MONITORING & OPERATIONS MANAGEMENT

**AgrOn Service Order Management**

*System that performs the planning of agricultural and forestry operations through service orders.*
- Issues work orders so that the scheduled functions are performed
- Controls the operations with field notes
- Projects the recommended performance and application of inputs according to characteristics of each area
- Integration with the Ti5 and Ti7 displays to send work orders with execution maps and subsequent receipt of the suggestions made
- Product available in the AgrOn Cultivation portfolio

**SWS**

*Information management system in agricultural and forestry operations.*
- Enables immediate corrective action of uncalibrated machines
- Generates number of seedlings based on real space after subsoiling
- Improves productive times by planning the maneuvering trajectory
- Allows monitoring the fuel supply
- Enables planning, inventory reduction and payment of resources as inputs and third parties
- Ability to work with the Ti5 and Ti7 displays
- Product available in the AgrOn Cultivation portfolio

**AgrOn Raw Material Traceability**

*System of automated raw material tracing from the origin all the way to delivery in the industry.*
- Uses advanced communication features, transmitting data from one machine to another via Wi-Fi
- Has the exclusive use of truck identification accessories to recognise transport units and automatically record data with the Ti5 and Ti7 displays
- Indicates the load and data source for payment
- It allows the estimation of georeferenced productivity
- Includes a data management module integrated with legacy raw material reception systems
- Product available in the AgrOn Harvesting portfolio
AgrOn Control Room

Centralised control system that monitors all operations performed in the field in real-time.

- Views operations and equipment through georeferenced maps
- Generates reports of operating times and stops, productivity and yields
- Shows the start and end time of operations, detailing all data sensed on the machines
- Notifications and alerts for processes to flow with maximum efficiency and productivity
- Constant monitoring between planned activities and executed operations
- It develops decision trees, with a script of standard procedures to be followed in certain occurrences and problems
- Ability to work with with the Ti5 and Ti7 displays
- Features add-on modules to cultivation, soil preparation and planting operations
- Product available in the AgrOn Cultivation and AgrOn Harvesting portfolios

Add-on modules for cultivation operations:

AgrOn Control Room | Cultivation

- Controls the complete cycle of input transport
- Monitors the volumes and dosages of products
- Emits alarms indicating delays, unplanned application or doses beyond the recommended amount
- Provides operational status of loading, transport and application equipment

AgrOn Control Room | Soil Preparation

- Provides complete daily machine status, with total area performed, hours worked, average speed and total percentage of availability
- Emits alarms and notifications of problems that require support and intervention from the controller
- Enables the comparison of daily goal with current or total position, by front and by equipment
- Includes alarms and notifications reporting delays in any activity in the planting cycle

AgrOn Control Room | Planting

- Includes a central control dashboard organised by work fronts
- Monitors the cycle of cutting, transporting and planting of seedlings in each front
- Provides the map of equipment with current status, planned goal, completed total and the occurrence of outages
- Allows the comparison of daily goal with current position of planting of each work front

Add-on module for harvesting operations:

AgrOn Control Room | Harvesting

- Provides a centralised monitoring view, covering field fronts to transportation and delivery to the industry
- Emits alarms and active notifications pointing to unforeseen stops, delays or performance problems
- Manages the transport cycle, with tracking of average times and vehicle speeds between the field and industry
- Allows you to view maps with transport routes and real-time tracking of travel in progress
- Manages lost times and includes analyses
MACHINE AUTOMATION

AgrOn Guidance

Orientation system that maintains alignment for tractors, machinery and agricultural and forestry equipment while executing routes.

- Accuracy in all modes of operation - straight, curved and pivot
- Includes multiple orientation options
- Loads map into system and enables control over the applied area
- Allows marking objects on the map to improve orientation in low visibility
- Integrated with the Ti5 or Ti7 display
- Includes the Remote Access add-on module
- Product available in the AgrOn Cultivation and AgrOn Harvesting portfolios
**AgrOn Machine Monitoring**

*Monitoring system for machines and fleets in the field.*
- Read RPM and/or similar parameters of the machine
- Time and downtime monitoring
- Speed information of the operation on the display
- Integration with pre-existing sensors of the machine
- Configurable alarms
- Integrated with software to register operations
- Integrated to the Ti5 or Ti7 display
- Includes the Remote Access add-on module
- Product available in the AgrOn Cultivation and AgrOn Harvesting portfolios

**AgrOn Auto Steering**

*Automated and precision navigation system for tractor, machinery and agricultural and forestry equipment.*
- Electric or hydraulic activation
- Includes an incline and abrupt maneuver correction system
- Enables work on straight lines, curves and pivots
- Adaptable to most tractors on the market
- High performance guaranteeing better adjustment to the route
- Ability to load maps with lines projected in the office
- Includes a wheel angle sensor, which detects small deviations in the trajectories even before the GNSS
- Includes a soil compensation system
- Integrated to the Ti5 or Ti7 display
- Includes the Remote Access add-on module
- Product available in the AgrOn Cultivation and AgrOn Harvesting portfolios

**AgrOn Sprayer Control**

*Automated control system of spraying sections during application.*
- Automatic control of the spray section
- Enables manual section control
- Automatic section closing, avoiding excessive spraying
- Allows installation with several valve assemblies in various types of sprayers
- Monitors and controls the application of one or two liquid inputs (herbicides)
- Integrated to the Ti5 or Ti7 display
- Includes the Remote Access add-on module
- Product available in the AgrOn Cultivation portfolio
**AgrOn Fertilisation Control**

*Automated control system for fertiliser and limestone applications.*

- Simple calibration and operation
- High precision controller
- Displays application traces during operation
- Records detailed operating information
- Monitors and controls the application of up to 3 solid inputs
- Imports maps (.shp) pre-defined in the office
- Integrated with Ti5 or Ti7 display
- Includes the Remote Access add-on module
- Product available in the AgrOn Cultivation portfolio

**AgrOn Bait Control**

*Automated system that controls the application of the formicidal bait during forestry operations.*

- Monitors and controls the application of ant bait (1, 2 or 3 actuators)
- Export maps of systematic georeferenced application
- Enables localised application and geo-referencing of scouts
- Exclusive to forestry operations
- Integrated with the Ti5 or Ti7 display
- Includes the Remote Access add-on module
- Product available in the AgrOn Cultivation portfolio

**AgrOn Planting Monitor**

*Monitoring system for spacing of seed and sugarcane billets.*

- Improved calibration with simple configuration
- Allows measurement of seed and billet populations (recommended or above recommendation)
- Enables night-time planting
- Exclusive for grain and sugarcane operations
- Integrated to the Ti5 or Ti7 display
- Includes the Remote Access add-on module
- *Product available in the AgrOn Cultivation portfolio*

**AgrOn Planting Control**

*Automated planter control system leveraged during agricultural operations.*

- Includes high precision controller
- Controls up to four simultaneous inputs
- Simple calibration and operation
- Allows variable rate planting of seed or billets
- Monitors and controls each section of seed/billets or fertiliser
- Exclusive for grain and sugarcane operations
- Integrated to the Ti7 display
- Includes the Remote Access add-on module
- Product available in the AgrOn Cultivation portfolio
**AgrOn Seedling Marker**
System that uses georeferencing to generate maps of seedlings and pits for forestry operation.
- Allows triggering of points through analogue or digital sensors
- Facilitates irrigation and fertilisation on each seedling through geo-referencing markings
- Exclusive to forestry operations
- Integrated to the Ti5 or Ti7 display
- Includes the Remote Access add-on module
- Product available in the AgrOn Cultivation portfolio

**AgrOn Subsoiling Control**
Automated subsoiling depth control system.
- Simple calibration and operation
- Allows visualisation of measurements during operation
- Records detailed operating information
- Integrated with the Ti5 or Ti7 display
- Includes the Remote Access add-on module
- Product available in the AgrOn Cultivation portfolio

**Add-on module:**
**Remote Access**
System for remote access to displays for technical assistance and calibrations.
- Allows remote monitoring of the machine
- Ensures a fast, efficient and low cost service
- Hands over control of the displays, for quick technical assistance
- Accepts different internet connections: cable, Wi-Fi, 4G, 3G and also, 2G
BENEFITS

Discover how the HxGN AgrOn platform can help your company’s Digital Transformation:

REDUCES WASTE OF RAW MATERIAL
Transporting raw materials from the field to industry is one of the most critical phases in agriculture, with many logistics risks involved - risks that can compromise the volume, quality and economy of production.

SYNCHRONISES AND CONNECTS OPERATIONS
Developed to minimise all potential losses that can occur in the field, acting mainly in the planning and synchronisation of operations, bringing predictability in the flow of raw material from the field to the industry, in the allocation of machines and inputs.

MAINTAINS PROFITABILITY AS PRICES INCREASE
Efficiency in the use of resources through control and automation of machines and implements and inputs, such as seeds, seedlings, water, fertilisers, chemicals, machinery and fuels, avoiding waste and maintaining profitability.

REDUCES MACHINE DOWNTIME
Maximisation of efficiency, performance and productivity of agricultural machinery, transport trucks and support vehicles, through interconnectivity, synchronisation and and diversion alerts of operations.
**Ti5 AND Ti7 DISPLAYS**

The displays allow users to use Hexagon Precision Agriculture products. They are compatible with several machines on the market and meet the needs of each customer, and it is possible to include only one or even all products in a single display.

- 5 "or 7" screens with touchscreen
- Rugged aluminum case
- Contrast screen for daytime viewing with lots of light or in low visibility conditions
- Multiple language support
- Detailed operation information record
- 3G, 4G and Wi-Fi network communication option
- Display Ti5 compatible with three products, being mandatory AgrOn Auto Steering, AgrOn Guidance and a product to choose
- Display Ti7 compatible with all products
- Interfaces CAN, USB and RS-232
- Certifications: R&TTE on Wi-Fi or 3G equipments, CE Marking, ISO 9001

**FARMING ACCURACY**

<table>
<thead>
<tr>
<th>Ti5</th>
<th>GNSS L1 10Hz - GPS/Glonass 28cm (pass to pass, 15min)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>GNSS L1/L2 20Hz - GPS/Glonass 15cm (pass to pass, 15min)</td>
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<tr>
<td>Ti7</td>
<td>GNSS L1/L2/Lband 20Hz - GPS/Glonass/TerraStar (4cm absolute)</td>
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<td></td>
<td>GNSS L1/L2/Lband 20Hz - GPS/Glonass/TerraStar (2,5cm absolute)</td>
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<tr>
<td></td>
<td>GNSS L1/L2 20Hz - GPS/Glonass/RTK - 2 cm (absolute)</td>
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</tbody>
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**MODES OF OPERATION**

- Line
- Line + Heading
- Parallel Curve
- Adaptive Curve
- Pivot
Hexagon is a world leader in digital solutions that create Connected Autonomous Ecosystems (ACE). Data is seamlessly connected through the convergence of the physical world with the digital world, embedding intelligence in all processes.

Hexagon solutions for sensors, software and data orchestration for industries enable the creation of intelligent digital realities that improve productivity and quality through applications for manufacturing, infrastructure, security and mobility.

Hexagon’s Agriculture division offers technologies that convert data into smart information that enables efficient planning and execution, precise machine controls and automated workflows, streamlining operations and increasing profits.

Hexagon (Nasdaq Stockholm: HEXA B) has approximately 20,000 employees in 50 countries and net sales of approximately 3.5bn EUR. Find out more at hexagonagriculture.com or follow @HexAgriculture.

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