

Digitalizing agriculture in Turkmenistan: 775 tractors, smart field operations, no cloud dependence

THE WINNER

IOT PROJECT OF THE YEAR 2024

This project is one of the winners of the IoT project of the year 2024 contest. Explore the article and [learn more about all the winners](#).

Challenge

Turkmenistan is home to a large agricultural sector. At the same time, the country maintains specific infrastructure and data policies that shape how digital systems can be implemented, including in agriculture.

Internet connectivity in agricultural regions is sometimes limited, and national regulations require that operational data be stored locally. In this environment, self-hosted systems are the preferred (and often the only) option for ensuring reliability at scale.

Within this framework, [CISEG](#) — a well-established distributor of agricultural and construction equipment — set out to digitize its fleet of **775 John Deere tractors**. To support operations across vast farming areas, **the company needed a reliable, on-premise smart farming IoT solution to enable real-time monitoring, fuel management, field control, and advanced reporting, all without relying on cloud connectivity.**

Solution

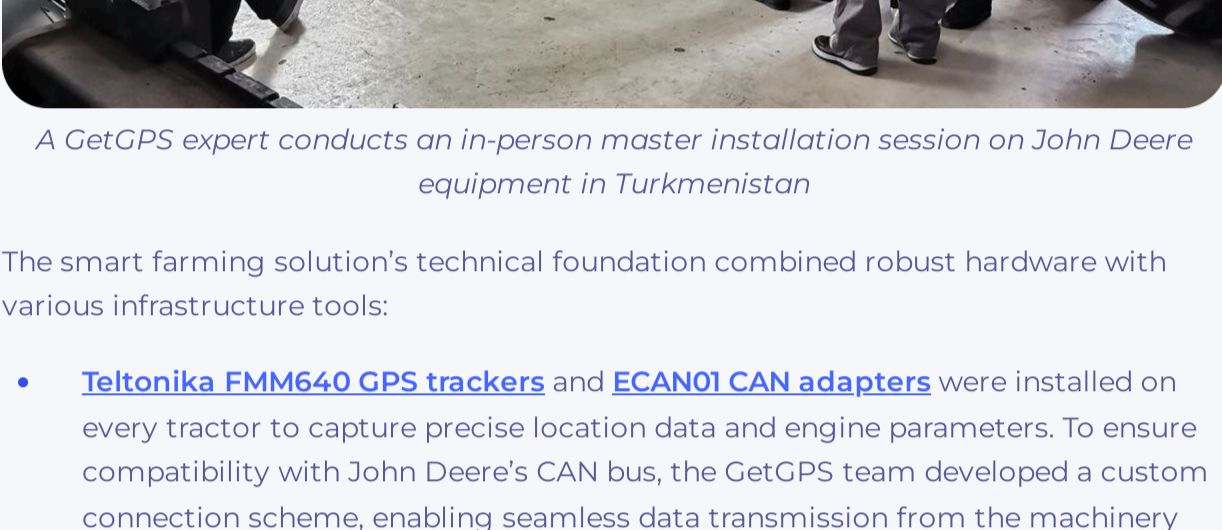
Long-time Wialon partner [GetGPS](#) stepped up to the challenge. To meet CISEG's requirements — local data hosting, remote operability, and full agricultural oversight — GetGPS implemented a fully self-hosted IoT solution for agriculture. It was **powered by Wialon's server-based solution**, built specifically for environments where cloud access is limited or unavailable.

"This was the largest project in our company's history," the GetGPS team shared. "Our staff spent a total of 7,546 hours on implementation, the equivalent of nearly 950 workdays or more than four team-years, from early planning to full rollout."

Implementation and hardware

The deployment covered the entire fleet of 775 tractors and required both technical precision and logistical coordination.

To kick off the project, a GetGPS expert traveled to Ashgabat, the capital of Turkmenistan, to carry out **12 master installations**: demonstration-based setups that served two purposes: showcasing the correct installation process and training CISEG's in-house technicians. Following these sessions, CISEG's team completed the remaining 763 installations independently, with remote guidance provided by GetGPS.



A GetGPS expert conducts an in-person master installation session on John Deere equipment in Turkmenistan

The smart farming solution's technical foundation combined robust hardware with various infrastructure tools:

- Teltonika FMM640 GPS trackers** and **ECAN01 CAN adapters** were installed on every tractor to capture precise location data and engine parameters. To ensure compatibility with John Deere's CAN bus, the GetGPS team developed a custom connection scheme, enabling seamless data transmission from the machinery directly into Wialon.
- Delta flowmeters** and **Eurosens deaerators** were used to deliver high-accuracy consumption monitoring. GetGPS also engineered a custom integration method for [Technoton Baltic](#) fuel sensors, tailored specifically to John Deere's fuel system. This approach was so effective that it led to the release of a branded sensor version based on their configuration.
- A fully local backend** was deployed using **Dell PowerEdge servers**, supported by **UPS systems** for reliability and connected via **MikroTik routers** to handle internal network traffic.
- Custom MikroTik scripts** managed device access and routing logic, helping maintain consistent communication between all system components.
- Custom Node.js scripts** continuously checked SIM card balances and automatically flagged low-credit risks to prevent data cutoffs.



Branded fuel sensor tailored to John Deere equipment by GetGPS and Technoton

Software

Wialon serves as the **central platform** that brings together all parts of the system. Wialon serves as the heart of this smart farm solution, integrating GPS tractor tracking, fuel control, driver behavior, and field operations monitoring across one interface. It provides the flexibility, control, and visibility CISEG needed to manage operations across their large, distributed agricultural fleet.

Key features include:

- Real-time tracking:** Managers instantly see every tractor's live location, operational status, and activity.
- Gurtam Maps:** Customized maps outline fields, depots, fuel stations, and maintenance areas, enhancing the accuracy of field operations monitoring.
- Geofence management:** Zones were set for fields, fuel stations, warehouses, and other key areas. When equipment crosses into or out of these boundaries, the system automatically logs this activity, allowing managers to analyze timing, field performance, and workflow consistency.
- Fuel misuse detection:** Real-time alerts immediately inform managers of any unauthorized fuel use.
- Automated reporting:** Regular, automated reports, covering fuel usage, routes, and productivity, are delivered to managers' inboxes, simplifying daily oversight.
- Proactive notifications:** Real-time alerts via SMS or email inform staff about speeding, route deviations, or fuel-related issues.
- Driver behavior insights:** The system automatically detects risky driving (speeding, harsh braking), allowing managers to address these behaviors proactively, increasing safety and reducing maintenance costs.
- Proactive maintenance scheduling:** Precise reminders based on engine hours and mileage minimize downtime, ensuring the fleet operates reliably during peak agricultural periods.
- Field management with [Wialon's smart farming solution](#):** Integration of the specialized solution helped automate field operations monitoring, track cultivated areas, identify overlaps or missed sections, and generate comprehensive reports.



Wialon shows live data from hundreds of tractors across Turkmenistan: visualizing fuel levels, engine hours, and location directly on the map

Support and additional services

GetGPS provided CISEG with a full range of support during and after the smart farming solution deployment:

- System planning:** Before implementation, GetGPS held 17 planning sessions to design connection schemes, determine sensor placement, and consult with hardware manufacturers (e.g. [Teltonika](#)) to ensure proper integration.
- Installation support:** Following the initial master installations, GetGPS provided remote guidance and troubleshooting to assist CISEG technicians during the full-scale rollout.
- Server configuration:** GetGPS handled remote setup of Wialon's server-based solution and network infrastructure. They also helped fine-tune all core system elements — from trackers to fuel sensors to mobile access.
- Ongoing support:** Since launch, the team has processed over 400 support requests, ensuring the system continues to run smoothly and efficiently.

Results

This fleet management project in Central Asia shows how localized IoT solutions and smart farming tools can enable large-scale [agricultural digitalization](#) even without cloud connectivity.

The successful transformation of CISEG's fleet and field operations gave the company a complete set of tools to manage operations across remote farming zones, confidently and independently of cloud access.

The solution proved so effective that CISEG is now preparing to expand the Wialon-powered solution to other areas of its business, further reinforcing their trust in the platform's scalability.

Full-scale digitalization

Every tractor is now connected and tracked, and all field operations are logged, analyzed, and visualized through a centralized platform.

Real-time visibility

Managers now have live access to each tractor's location, status, and activity.

Fuel transparency

Fuel consumption is accurately tracked, helping prevent losses and improve planning.

Driver behavior monitoring

Harsh braking and extended idling are now visible and manageable, reducing wear and improving safety.

Reliable system performance

The solution delivers consistent operations with no reliance on cloud connectivity.

Company profile

IoT project of the year nomination: Corporate or large government fleets

Country: Turkmenistan

Industry: Agriculture

Solutions

 Wialon

 Smart farming

Hardware

 Teltonika FMM640

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