



SMART FARMING WITH A 5G ROUTER FOR FARMING TRACTORS

HIGHLIGHTS

- ✔ Smart farming is heading in the direction of 5G, necessitating high bandwidth and low latency for farming equipment such as autonomous farming tractors.
- ✔ The RUTM50 is an FCC-certified 5G router perfect for deployment in this sector, meeting the strict needs of smart farming tractors with ultra-high cellular speeds of up to 3.4 Gbps and a wide range of network reliability features.
- ✔ The RUTM50's NTRIP support enables the main controller to communicate with the NTRIP server and receive the corrections necessary for precise tracking of the tractor and its equipment.

THE CHALLENGE – SMART FARMING AND THE WORLD OF TOMORROW

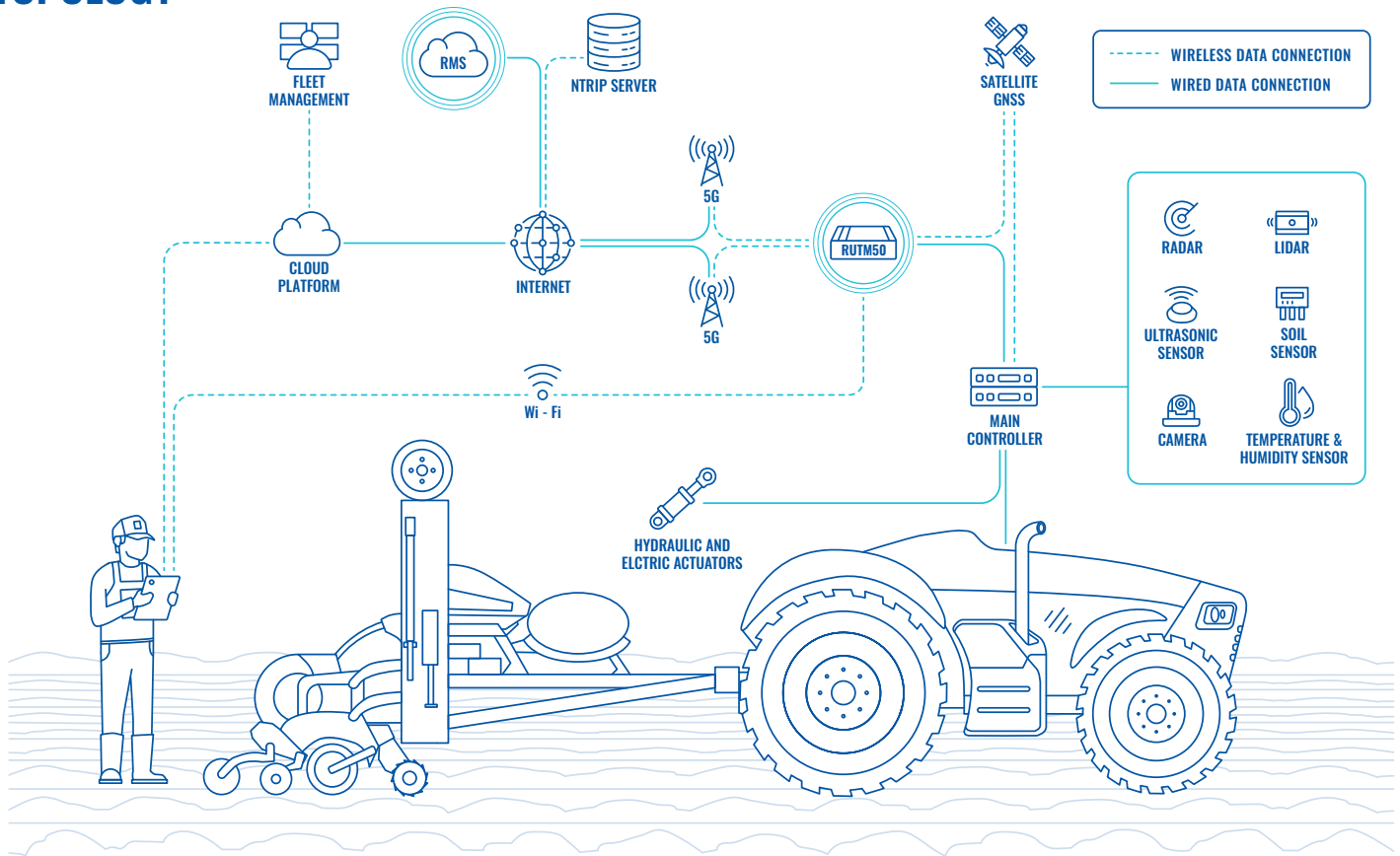
Without a doubt, the future of agriculture is smart. In a nutshell, smart farming is the application of IoT, AI, and automation in the agriculture sector. Its [global market](#) size was \$13.06 billion in 2022 and is expected to grow to \$14.69 billion in 2023, at a CAGR of 12.5%. Clearly, this growth will only increase in the coming years.

A major factor of this growth is the exponential adoption of 5G technology for IoT in agriculture. This technology provides the high bandwidth and low latency necessary for real-time communication between smart equipment, such as farming tractors, and the 5G network. In turn, these allow a greater number of tractors to operate autonomously across a wide coverage area, while also making any remote operations simple, reliable, and secure.

These aren't theoretical ideas of innovation, but very real IoT systems enhancing the yields and efficiency of smart farms all over North America this very moment – all while reducing operational costs. If your farm hasn't made the jump to 5G yet, it's bound to be outcompeted sooner rather than later.

Of course, at the core of this infrastructure is a heart of connectivity that keeps all smart equipment connected and data flowing seamlessly. The choice of networking device is a critical one, and Teltonika Networks has the perfect device for the job: the RUTM50 5G router.

TOPOLOGY



THE SOLUTION – THE RUTM50 5G ROUTER

RUTM50 is an FCC-certified 5G cellular router tailor-made for the North American market. It features ultra-high cellular speeds of up to 3.4 Gbps and supports both SA and NSA 5G architectures.

Once installed inside the tractor's cab or on its roof, this 5G router connects to the farming tractor's main controller via an Ethernet connection. The controller is then connected to a wide range of smart devices that enable the tractor to operate autonomously and efficiently.

Among those devices are hydraulic and electric actuators for powering and controlling the plow, crop sprayers, and other parts of the tractor; soil and weather sensors for assessing environmental conditions out in the field; and devices for detecting obstacles and avoiding collision, including GNSS and INS systems, radar and lidar systems, ultrasonic sensors, and a camera.

Using all of these devices, the tractor creates a model of its environment and plans a safe and efficient path to follow autonomously. If manual planning or operation is needed for any reason, such as unexpected hardware failure, the RUTM50's Wi-Fi capabilities allow for seamless remote operation. By facilitating communication between tractors, the RUTM50 enables more efficient fleet management. You can even enhance this communication using a [dedicated 5G MIMO antenna](#).

Of course, to truly manage your fleet of smart farming tractors with peak efficiency, you want to take advantage of this 5G router's support of the NTRIP protocol. This enables the router to relay RTK correction data between the tractor's controller with a built-in RTK receiver and the NTRIP server. As a result, the tractor receives its exact location and can precisely maneuver and control its agricultural implements.

The way it works is that the tractor's controller, equipped with an RTK receiver, requests RTK corrections from the NTRIP server. The server processes this request and sends back the necessary data. The controller then uses these corrections to determine and display its precise location, enabling the tractor to operate effectively in the fields without human supervision.

The connectivity of this holistic IoT system must also be maintained at all times, so ensuring uninterrupted connectivity is a must. This is why this 5G router comes with auto-failover, backup WAN, and other switching scenarios for ensuring uninterrupted connectivity. Even in areas where 5G isn't fully-supported, the RUTM50 is backward-compatible with 4G, and will simply switch to LTE Cat 19 to ensure stable connectivity.

All of these features are housed in a compact and sturdy aluminum casing weighing only 519 grams. This housing offers resistance to vibrations and extreme temperatures between -40 °C to 75 °C, making it ideal for environmental conditions synonymous with agriculture. Last but not least, this 5G router is easily installed thanks to its DIN rail mounting, which is possible on both sides of the device.

All in all, the RUTM50 delivers the connectivity autonomous farming tractors need and helps elevate smart farming to the competitive environment of tomorrow.

