



Go Wireless NZ



In collaboration with



#### Market:

Agriculture, Horticulture, Viticulture.

#### Problem:

The farm faced challenges with remote monitoring of its extensive water systems, environmental compliance, and time management across a 1,200-hectare operation.

#### Solution:

By implementing a scalable LoRaWAN network, the farm consolidated all monitoring functions onto a single platform, eliminating the need for multiple apps and costly subscriptions.

#### Requirements:

- Milesight UG67 Gateway for network connectivity
- Milesight EM300-SLD leak detection sensors for water tanks
- Milesight UC300 solar and environmental monitoring controllers
- Milesight UC501 for soil moisture and irrigation management
- Scopious IoT platform for centralised data monitoring and management

#### Results:

The farm saved significant time on daily checks, reduced operational costs, and improved compliance with farming consents—all without increasing costs as the system scaled.

## How a South Canterbury Farm Streamlined Operations Without Scaling Costs

20 water tanks, 3 solar systems, grain silos, irrigation, and on-farm safety - all remotely monitored, saving hours in daily checks.



**“What used to take hours of driving and manual checking now takes minutes on a phone, the entire farm is connected, and seeing the benefits every day.”**

- John Evans - Systems Integrator for this project.



# Introduction

A 1,200-hectare, 10,000 stock unit sheep and beef farm in South Canterbury has successfully adopted Internet of Things (IoT) technology to enhance efficiency and meet operational compliance.

Faced with the need to remotely monitor and control various systems—ranging from irrigation and environmental compliance to an extensive stock water network—the farm's owner sought a scalable, low-power, and cost-effective solution. After exploring available technologies, the decision was made to implement a LoRaWAN (Long Range Wide Area Network) system.

With guidance from Go Wireless NZ, the farm adopted the Milesight range of hardware, beginning with a single LoRa gateway. The overarching goal was to consolidate all measurement and monitoring needs onto a single, unified platform. Recognising the challenge many farmers face with managing multiple apps and subscription services, this solution was designed to streamline operations while minimising complexity and ongoing costs.

## Problem - Business Impact

One of the greatest opportunities in modern farming lies in making timely, data-informed decisions. Early issue identification, informed decision-making, and effective risk management are all enhanced through reliable access to real-time information.

However, farmers are often stretched for time, making it essential to use each hour efficiently—balancing the demands of the farm with family, community, and personal well-being.

A key challenge faced on this South Canterbury farm was the potential for undetected issues in the stock water system. A fault in the water network can quickly escalate into an animal health concern and cause significant damage to infrastructure such as water troughs and fencing. Some parts of the system require up to an hour for a round-trip inspection, making manual checks time-consuming and inefficient.

In addition, compliance with farming consents is essential for the operation of the business. Demonstrating adherence to consent conditions during farm audits depends heavily on accurate and accessible data. As such, the ability to monitor systems remotely and reliably became a critical need.

## The Solution - Technical Dive

To address the farm's monitoring and control challenges, the first objective was to track water levels across 20 tanks, each supplying its own network of troughs. While several commercial solutions were available, the upfront investment and ongoing subscription costs, particularly for cellular-based systems, proved prohibitive, especially in areas with limited or no cellular coverage.

The decision to proceed with a LoRaWAN solution enabled a more scalable and cost-effective approach. A Milesight UG67 gateway was installed at the farm yard and connected to the internet via Starlink. Each water tank was equipped with a Milesight EM300-SLD leak detection sensor, configured to trigger an alert when water levels dropped below a critical threshold, typically two-thirds of the tank's capacity.

Initially, the first gateway provided coverage for approximately half the property. To extend coverage, a repeater was installed on a hilltop, linked to a second UG67 gateway via a Ubiquiti radio connection, ensuring full LoRaWAN coverage across the farm.

Data collected from various systems, including water tanks, solar panels, soil moisture sensors, and grain silos, was integrated and remotely monitored through the Scopious IoT platform. This centralised platform allowed the farm owner to access real-time data and manage all farm systems remotely, from



irrigation schedules to solar energy production, ensuring better decision-making without the need to be physically present on-site.

Additional sensors and controllers were deployed to monitor and automate key systems. A Milesight UC300 was connected to the farm's solar controller using Modbus RS485, enabling the collection of data such as battery voltage, daily power generation, and energy consumption. The same controller also measured soil moisture, soil temperature, wind speed, and wind direction. A tipping bucket rain gauge linked to the UC300 captured rainfall data, while its relay controls were used to automatically shed power loads, such as webcams, during extended periods of low solar input.

To support irrigation management, UC501 controllers were installed beneath each centre pivot. These units were connected to low-cost RS485-compatible soil probes and rain gauges sourced online. Soil data was calibrated to show stress and holding capacity levels, offering precise insights into irrigation effectiveness. This approach not only improved water use efficiency but also satisfied the monitoring requirements of farming consents—at a fraction of the cost of traditional solutions and with no ongoing subscription fees.

Grain storage was also brought into the system. A UC501 monitored grain temperature at multiple depths within a silo using string-mounted RS485 sensors. Ambient temperature and humidity were tracked with a nearby EM300 sensor. This data supports grain drying and cooling decisions, with alerts in place for thermal runaway events.

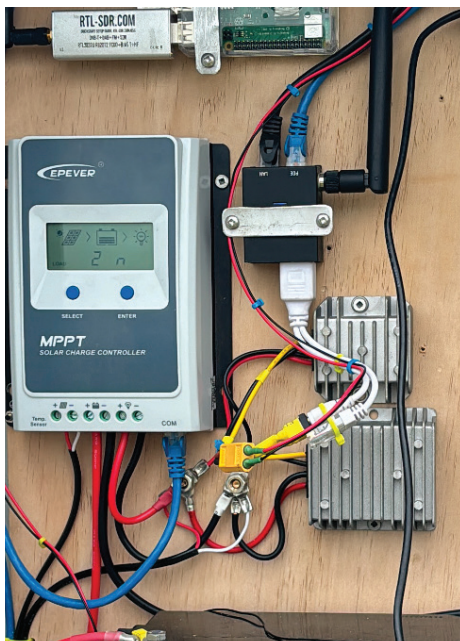
For public safety, a UC1152 was installed to manage flashing LED stock signs on either end of a public road that passes through the farm. The signs can be activated on-site using a timer or remotely via an app. Once one sign is activated, the second automatically switches on.

Building on the system's success, a UG67 gateway was also installed at the Fox Peak Ski Club. There, the same LoRaWAN infrastructure is used to monitor solar power systems for the ski field's webcams and lodge accommodation. Future plans include snow depth monitoring and safety system integration.

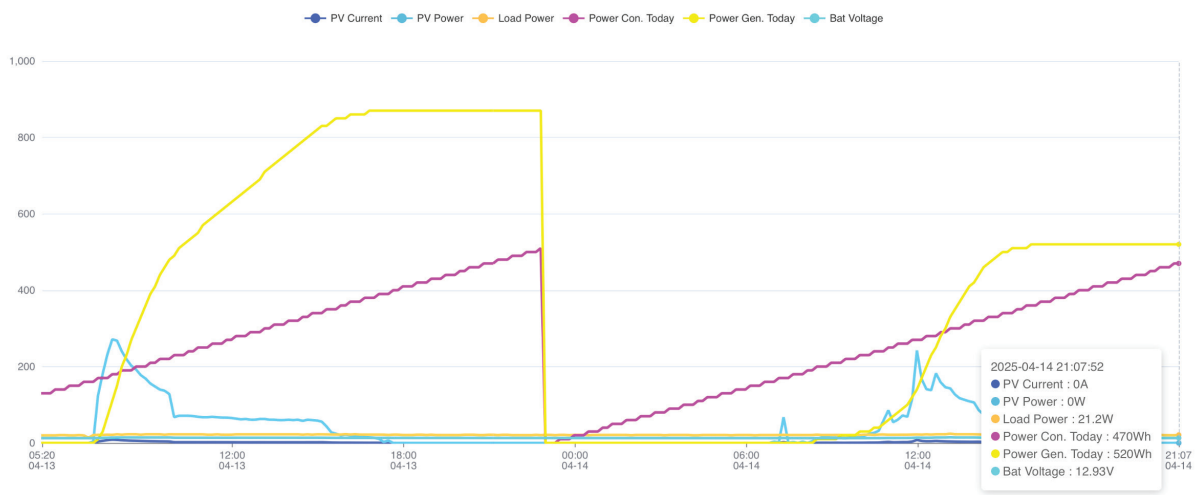
The technology has also been extended to a friend's dairy farm in Manawatū, where a UC501 and ultrasonic flow meters are used to track water usage. The RS485 protocol proved particularly beneficial, allowing multiple devices to communicate over a simple two-core cable, supporting scalable and flexible deployments.

Looking ahead, the farm plans to implement LoRaWAN controllers to remotely operate centre pivots, k-line, and fixed grid irrigation systems. A prototype UC501 controller is already in place for fixed grid irrigation, laying the groundwork for fully automated, flow-rate-optimised irrigation scheduling.

This comprehensive system has been made possible through the affordability and energy efficiency of the Milesight hardware range, combined with the guidance and support from Go Wireless NZ.







*Solar stats for the off grid photo voltaic system*

## The Results

The implementation of the LoRaWAN-based IoT system has delivered significant operational, financial, and compliance benefits for the South Canterbury sheep and beef farm.

One of the most immediate gains has been in time efficiency. Remote monitoring of the water network has eliminated the need for daily physical inspections of tanks and troughs, some of which required over an hour of travel. Early leak detection has prevented animal health issues and costly infrastructure damage, while ensuring uninterrupted access to stock water.

The system has also proven vital for compliance and audit readiness. Real-time environmental and soil moisture data support the farm's ability to meet consent conditions and provide clear, traceable data during audits—an increasingly important part of sustainable farm management.

Financially, the move to LoRaWAN and RS485-compatible devices has dramatically reduced monitoring costs. By avoiding cellular connections and subscription-based platforms, the farm has lowered its ongoing costs. For example, replacement soil moisture probes were acquired for around 10% of the cost of traditional solutions—without recurring fees.

The flexibility and scalability of the system have opened up new possibilities. The infrastructure now supports a wide range of functions, from automated irrigation scheduling to solar system monitoring, weather tracking, and grain silo management. The same approach has been successfully replicated at other sites, including a dairy farm and the Fox Peak Ski Club, demonstrating its broader applicability across different rural environments.

Overall, the adoption of IoT has not only streamlined operations but also provided peace of mind, enabling the farm to operate more efficiently and sustainably while staying connected in even the most remote areas.

## Recommendations for others considering the product:

For those in agriculture, horticulture, or viticulture exploring IoT solutions, this South Canterbury farm offers a clear example of what's possible: practical, scalable, and cost-effective technology that delivers real-world value.

One of the greatest strengths of a LoRaWAN-based system is its scalability. Once the network infrastructure is in place, new sensors and controllers can be added with little to no additional ongoing cost—a major advantage over cellular or subscription-heavy platforms. Whether monitoring irrigation systems, tracking environmental conditions, or managing infrastructure across large or remote properties, this approach provides a flexible foundation that grows with your operation.

Supported by low-power devices and robust long-range connectivity, this type of network is especially suited to rural environments where coverage can be patchy and resources are stretched.

For growers and producers looking to increase efficiency, reduce manual workload, and improve compliance, IoT isn't just a tech trend, it's a practical tool that pays off.