RUBICON™

FarmConnect™

Surface Irrigation Management Solution

Introducing the Internet of Agriculture™

Automate your surface irrigation layout using intelligent actuators and know when to irrigate and how much to apply using smart in-field sensors.

FarmConnect is a scalable IoT solution to digitize your on-farm operations.

farmconnect.com

FarmConnect™

Have you been waiting for the right automation solution for surface irrigation to come along so you can reduce the manual operation of opening bay outlets or shifting siphons? Have you ever wanted to know when to water and more importantly exactly how much water you've applied?

FarmConnect enables growers to automate surface irrigation to:

- reduce labor
- save water
- increase yields
- reduce energy costs
- improve profitability

All within a single, integrated irrigation management platform.

Rubicon Water has leveraged two decades of irrigation automation experience to create FarmConnect, and it'll change the way you irrigate, forever.

It is the ultimate irrigation technology platform, giving you the tools to determine the optimal time to irrigate, how much to apply, and analyze performance. The introduction of automated surface irrigation, with in-field sensors for soil moisture, micro-climate inputs, water level, wetting front advance, plus irrigation scheduling tools and communications via IoT-enabled nodes will help farmers know, with precision, when to irrigate their crops and how much water to apply.

FarmConnect's smart yet simple software and unique capability for integration with third-party devices provide users with a single interface to handle a multitude of on-farm irrigation operations.

Not only does FarmConnect take the grunt work out of irrigating but it also removes the guesswork by putting accurate measurement, smart sensor data and precise control at your fingertips. FarmConnect's easily accessible real-time and historical information will empower you to confidently make and implement profitable decisions.

In addition, water supplied on-demand to the farm, at the desired flow rate for a set duration enables flexible management to support variable rate automated irrigation technologies.

Automate your surface irrigation

High-flow surface irrigation together with automation and accurate and precise timing combine to form what can be termed **High-Performance Surface Irrigation**. In evaluation studies conducted by leading irrigation researchers, higher irrigation flows have been shown to offer improved application efficiencies in excess of **85% and reaching as high as 95%** on some soils.

Automation of surface irrigation, using Rubicon's FarmConnect solution provides the needed certainty in managing irrigation durations (along with very substantial labor efficiencies), measurement of flow rate (Smart Meter) onto the bays and the determining the irrigation advance rate (SmartFront™ sensor) early in each irrigation to provide the data needed to calculate the precise time to cut-off required for that irrigation.

When should I irrigate?

Irrigation scheduling is a critical determinant of yield, dry matter or fibre quality and water-use efficiency. With up-to-the-minute soil moisture, rainfall and weather data in your hands, you can optimally time your irrigations. You can even let FarmConnect predict the date of the next irrigation for you.

With precise soil moisture data you can adjust irrigation intervals to maximize water uptake from further down the soil profile, increasing the capacity of the soil to accept the next irrigation, reducing waterlogging and producing a higher-yielding crop.

How much should I apply?

With both over and under-watering having a significant negative impact on yield, determining the right irrigation duration or runtime is critical. It's even more important with high-flow irrigation, where a miscalculation can quickly wipe out any efficiency gains. In-field wetting advance sensors, dynamically calculate infiltration to produce the optimal runtimes and then automatically communicates the precise cut-off point for the automatic execution of irrigation schedules with complete control using our next generation actuators.

Using a combination of raw inputs derived from the in-field sensors and flow information from actuators, the AgPod™ Gateway is able to stream real-time data to drive on-farm decisions.

Track the microclimate of your crop

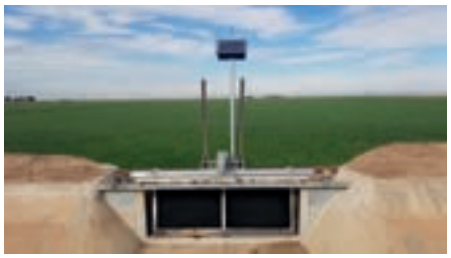
Leveraging the technology in Rubicon's Weather Station, when coupled with the AgPod, provides farmers with precision microclimate data in real-time as conditions change in-field.

Introducing the **Internet of Agriculture™** - where physical IoT enabled on-farm devices, edge computing power, sophisticated communication infrastructure and dedicated data storage frameworks work together to stream insightful information to drive accurate decisions on-farm - saving water, cost on labor, expenditure on energy... all while maximizing yield.

Surface irrigation configurations

Border-check with farm canals

Automated BayDrives™ control the flow of water in farm canals and onto each bay. Replace the small manually operated outlets to a bay with a single larger concrete outlet with an overshot rubber insert gate.



Border-check with pipe and riser valves

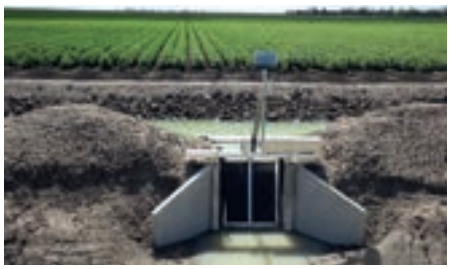
Automated BladeValves™ and pump monitoring connected to pipelines to control water onto each bay. Replace the manually operated valves with this automatic valve.

Bankless channel

Automated BayDrives along canals constructed below field level supply water to a series of connected terraced bays. This configuration also utilizes a range of in-field sensors, managed within the FarmConnect software interface.

Automated furrow

Automated BayDrives™ control water into each furrow via a pontoon layout which serves as a launch pad at the head of the field to simultaneously water a large number of furrows. This layout automates and capitalizes on existing siphon infrastructure and replaces manual operation of siphons.



Automated rice

Combination of BayDrives™ and sensors automate the water flow and optimal water levels in rice crops to provide real-time control of flow regulation and water level management in the rice field. This method is particularly relevant with new rice genetics and the requirement for precision water level management for each stage of growth.

How it works

1. The farm supply point opens and begins to fill the gravity-fed open farm canal or starts a pump to fill a buried pipeline
2. For canal water delivery, the MicronLevel™ Air sensor detects when the water has reached the required level
3. The first BayDrive or BladeValve in the programmed irrigation sequence opens to water the first bay
4. The SmartFront Sensor detects the wetting front and the surface water depth
5. FarmConnect software uses this information to calculate the optimal runtime for this bay. The software then uses this model to adapt the programmed runtimes for the rest of the bays
6. The first BayDrive or BladeValve closes at the calculated time and the second BayDrive opens for the amount of time calculated by the software model
7. The process continues until all bays in the series have been irrigated

Solution Overview

RUBICON™

Introducing the **Internet of Agriculture™** to your farm

Flow control and measurement

On-demand supply means farmers can take advantage of new technology to ensure constant flow from gravity-fed supply canals onto the farm.

In-field sensor

Integrated on-farm sensors, providing insightful data in a single interface to assist in determining when to irrigate and how much to apply.

Automated checks and valves

Remotely operated gate actuators and high-flow pipe valves that makes surface irrigation less labor-intensive and more flexible using in-field sensors. Automate irrigations to precisely meet crop water requirements.

Irrigation scheduling

Soil monitoring technology and analytics enable irrigators to determine when to irrigate and how much to apply to maximize crop yield and improve water-use efficiency.

Micro-climate weather data

All-in-one microclimatic Weather Station that provides precision data with minimal maintenance requirements.

IoT enabled networks

The Internet of Agriculture™ brings together connected devices and smart sensors on your farm via the AgPod™ which is an edge-of-field processor and broadband gateway linking to cloud-based software, enabling farmers to manage their irrigation, analyze field data and interpret real-time field conditions remotely. The open platform flexibility introduces interfacing capabilities with other on-farm IoT devices, providing a single, scalable solution to digitize your farm.

With FarmConnect™ you can:

- Keep an eye on crop water demand from anywhere in the world
- Initiate an irrigation program with just a few clicks
- Receive notifications to keep you informed of progress
- Avoid over or under-watering by using sensors to determine runtimes
- Program gates to automatically open when preset water levels are reached
- Drive down costs and increase yields with performance benchmarking
- Know exactly how much water you've applied per irrigation and per season

Scan to watch solution overview video

Solution Components

AgPod™

The AgPod is a powerful on-farm IoT gateway with the capability to integrate both FarmConnect and third-party devices to process raw inputs to inform data-driven decisions.

The AgPod features Motorola's MC-Edge RTU with powerful edge-of-field computing features to ensure accurate and responsive calculations for automation control and data analytics.

The AgPod's unique capability of calculating ET, rainfall and applied irrigation when interfaced with the Rubicon Weather Station enables users to derive soil moisture in real-time - a fundamental input for irrigation scheduling.

The open platform provides flexibility and the capability to interface with other on-farm IoT devices, to introduce a single, scalable and powerful IoT solution to digitize your farm.

MOTOROLA SOLUTIONS
CHANNEL PARTNER

BayDrive™

The BayDrive is a remotely operated actuator for controlling flow in farm channels and onto bays. The BayDrive is driven by Rubicon's CableDrive™ actuation system, proven in thousands of automated gates around the world. Reliable operation is ensured by combining robust engineering with integrated solar power supply and radio communications.

BladeValve™

The BladeValve is a remotely operated high-flow pipe valve that makes surface irrigation less labor-intensive and more flexible. It provides the freedom to irrigate without having to be on-site and the ability to precisely time irrigations to help you improve yields and reduce water use.

FarmConnect™ Software

FarmConnect software is a cloud/web application that enables the monitoring of crops and the management of an irrigation with data derived from integrated sensors and automated in-field devices. Innovative and scalable, the FarmConnect platform enables users to irrigate using less time, effort and water.

RiserDrive™

The RiserDrive is an intelligent device designed to remotely control existing on-farm pipe and riser valves. The RiserDrive combines robust motor drive mechanisms, sophisticated communication technology, and FarmConnect software capabilities to automate existing on-farm valves for high-flow surface irrigation.

MirconLevel™ Water Measurement Sensor

The MicronLevel water measurement sensor revolutionises irrigation management by accurately measuring and monitoring water levels in real-time.

Water level and height measurement is crucial for optimising water usage, preventing wastage, and enhancing crop performance, to enable precise irrigation scheduling and control for improved water management.

Weather Station

Making informed decisions on-farm requires real-time knowledge of your microclimate. The Rubicon Weather station delivers precision microclimate inputs with minimal maintenance requirements.

The Weather Station is an accurate and reliable all-in-one device for measuring localized weather and determining Reference Evapotranspiration (ETo) across your farm. The patented high precision, high intensity rainfall measurement system and unique flush-valve mechanism prevents the build-up of debris associated with traditional rainfall methods. Additionally, the onboard remote diagnostics provides confidence that the station is operating accurately.

FerIT™ Node and FerIT™ Solar Node

The FerIT Node is a data monitoring, control, and communication device for on-farm applications. The Node enables remote management of farm devices, providing a smart IoT solution for continuous monitoring, operation or control. The FerIT is used to connect, power and monitor data from in-field devices while communicating with the AgPod to assist in on-farm decisions. The rugged enclosure is designed to withstand harsh agricultural conditions.

SmartFront™ Sensor

The SmartFront wetting advance sensor precisely detects the water advance, while calculating the surface water depth and infiltration. Using the SmartFront's sensor data, FarmConnect software dynamically calculates the precise irrigation cut-off point to avoid over and under-watering. It then closes any automated bay gates and valves or sends an SMS alert for manual shutoff.

Third-party integrations

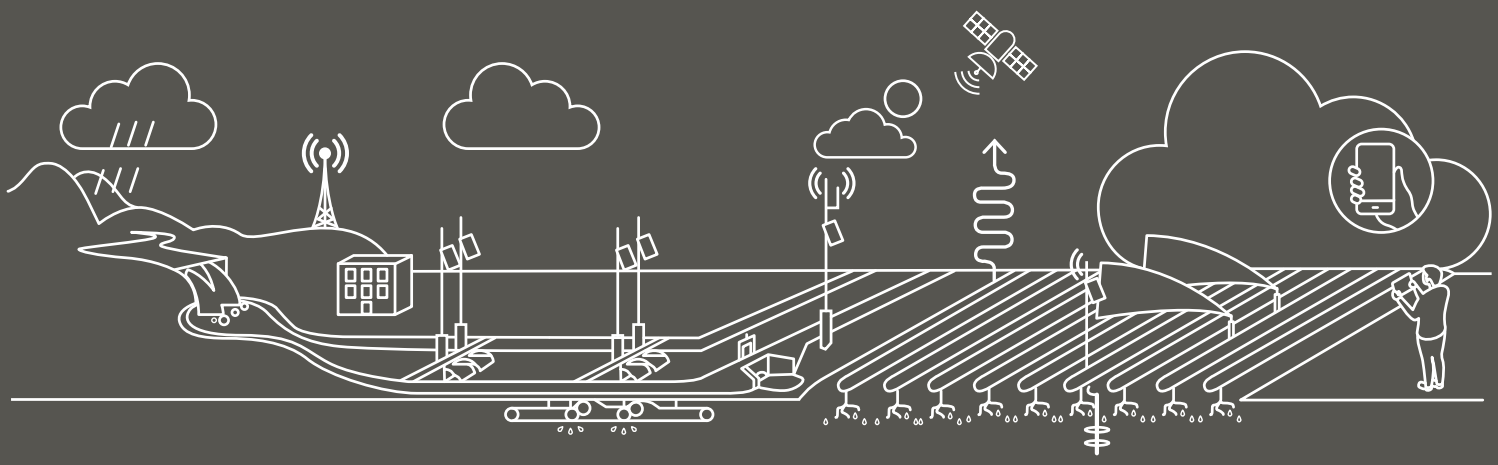
FarmConnect's open platform using LoRa communication with the AgPod™ allows for a range of vendors to incorporate their on-farm technology within a single radio network and continue to provide their value-add to the irrigator. This future-proofs the investment and provides flexibility for the irrigator.

Currently, selected third-party soil moisture sensors are available.

RUBICON™

FarmConnect™

Maximizing the efficiency, productivity and sustainability of irrigated agriculture



About Rubicon Water Rubicon Water delivers advanced technology that optimizes gravity-fed irrigation, providing unprecedented levels of operational efficiency and control, increasing water availability and improving farmers' lives. Founded in 1995, Rubicon has more than 35,000 gates and meters installed in 17 countries.

SB-FCIMC-10/23-US

Toll free: 1 877 440 6080
Telephone: (970) 482-3200
inquiry@rubiconwater.com

farmconnect.com