Uncompromised Fertigation & Environmental Control Systems

2024 Brochure

Rhythm Cultivation Solutions and Services, LLC. Fort Worth, TX. 833-749-8461. sales@rhythmcss.com
https://www.rhythmcss.com

Our offerings

AFS

FERTIGATION SYSTEMS

Go to page 02 ▶

- Skid-built Batch Systems
- Inline Systems (Direct Injection)
- Custom design/layout options
- Day storage/reservoir mgmt for high frequency irrigation
- Dosatron/Mix-Rite/Dosmatic
- Recirculation Systems

ENV

ENVIRONMENT CONTROL

Go to page 09 ▶

- HVAC integration
- Lighting dimmability & spectrum
- CO_2
- Dehumidifier & Humidifier
- Fans & Exhaust
- Greenhouse controls

DATA

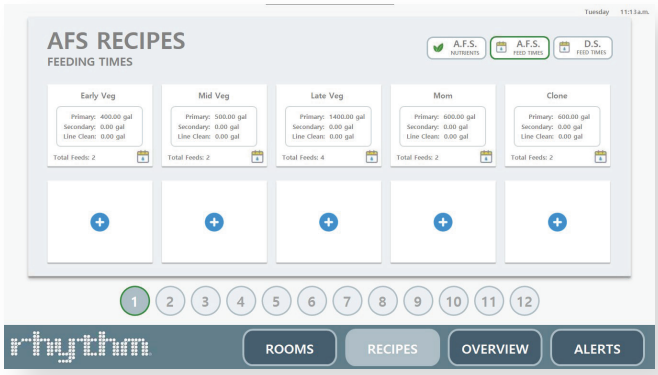
DATA ANALYTICS

Go to page 11 ▶

- Fertigation reports
- Environment trending
- Nutrient and water costs
- Custom filters

Featuring our advanced fertigation software

NEW UPDATES ▶



LIVE DASHBOARD

See a live overview of your room when it's:

- Mixing a tank
- Preparing a recipe
- Feeding a room/zone
- Dosing nutrients
- pH & EC stabilizing
- Transferring water

RECIPE CREATION

- Create recipes for nutrients and delivery times
- Schedule recipes up to 15 weeks in advance
- Sequence nutrients using our pre-stir and post-stir features
- Switch between primary and secondary nutrient recipes through out each week

USER FRIENDLY

- Intuitive user experience
- Remote access from any PC or mobile device
- Alerts via text or email
- User management
- Feed reports
- Locally hosted software does not rely on internet

Build Your Fertigation Model

AFS

BATCH SERIES

Single Batch
Go to page 03 ▶

Multi-Batch
Go to page 04 ▶

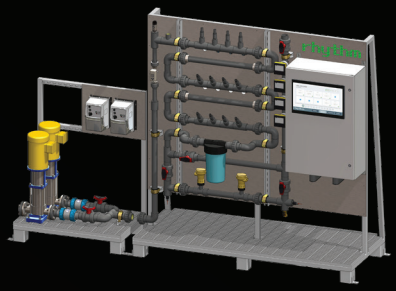
The Rhythm Single Batch and Multi-Batch AFS systems utilize one or two working mixing tank(s) to prepare, stabilize, and deliver recipes, on-demand. They can be configured to work with a large range of facility sizes, layouts, growing methods, and plant quantities, and are designed to work in conjunction with a pressure compensated drip irrigation system (not included). A custom solenoid valve manifold is included for each mixing tank. The solenoid valves are used for delivery from the AFS to each room, zone, and/or reservoir, as well as to drain/dump the system. Main line plumbing should be 1-1 ½ inch schedule 40 or schedule 80 PVC.
Additional plumbing requirements include a 1" input line to the AFS for fresh water (should be a pressurized supply), and a 1" output line to a drain/dump location.

GOOD FOR ▶

Growers with complex nutrient programs, nutrient sequencing requirements, or growers that prefer a batch preparation methodology over inline injection.

INLINE SERIES

Go to page 06 ▶



The Rhythm Inline Series AFS is a direct injection system that utilizes Grundfos SMART digital dosing pumps to precisely injection nutrients directly into the flow of water. These dosing pumps provide advantages over competitive pumps by utilizing variable-speed stepper motors with internal stroke speed control for smooth, continuous dosing – resulting in more consistency through the delivery process. The Inline Series units can be configured to work with a large range of facility sizes, layouts, growing methods, and plant quantities, and are designed to work in conjunction with a pressure compensated drip irrigation system (not included). An optional solenoid valve manifold can be included for delivery from the AFS to each room, zone, and/or reservoir, as well as to drain/dump the system. Main line plumbing should be 1-1 ½ inch schedule 40 or schedule 80 PVC. Additional plumbing requirements include a 1 ½-2" input line to the provided pump skid for fresh water (flooded suction) and a 1-1 ½ inch output line to a drain/dump location.

GOOD FOR ▶

Facilities requiring a space saving design and/or higher daily feeding volumes, more frequent feedings, or quick reservoir preparation times.

2, 3 or 5HP
Variable frequency drive controlled irrigation pumps

10-45 mins
Average batch times

up to 40 GPM
Feeding flow rates

SB Single Batch

Batch tank size.....**200, 350, or 500 gal**
Number of nutrient injectors.....**up to 16**
Nutrient dosing range.....**0.5-unlimited mL/gal**
Fertigation outputs.....**up to 24 outputs**
Zones per output.....**up to 8 zones***
Max feeding events per room per day.....**16 events**
Layout options.....**skid or non-skid**
Number of recipes.....**120 recipes**

Go to FULL SPECS

**Options available through configuration for up-to 32 zones per room*

Example of a single batch non-skid layout

Standard Equipment / Features ▶

- Intuitive Rhythm AFS software
- Robust VFD controlled irrigation pumps
- pH & EC stabilization
- Optimize delivery w/ adjustable room feeding pressures
- Create recipes by nutrient content and time/day schedule
- Flush main lines before and after each watering event
- Clean-in-place settings to better manage irrigation residual
- Temperature monitoring & protection
- Remote monitoring and control

Add-on ▶

DAY STORAGE UPGRADES

Prepare reservoirs and automate monitoring and delivery schedules for more frequent feeding requirements

Go to page 08 ▶

ENVIRONMENT MANAGEMENT

Go to page 09 ▶

2, 3 or 5HP
Variable frequency drive controlled irrigation pumps

10-45 mins
Average batch times

DUAL
Tanks that run simultaneously

MB Multi Batch

Batch tank size.....**(qty 2) 200, 350, or 500 gal**
Number of nutrient injectors.....**up to 16 per tank**
Nutrient dosing range.....**0.5-unlimited mL/gal**
Fertigation outputs.....**up to 12 + dump per tank**
Zones per output.....**up to 8 zones***
Max feeding events per room per day.....**16 events**
Layout options.....**skid or non-skid**
Number of recipes.....**120 recipes**

Go to FULL SPECS

**Options available through configuration for up-to 32 zones per room*

Example of a multi-batch non-skid layout

Standard Equipment / Features ▶

- Intuitive Rhythm AFS software
- Robust VFD controlled irrigation pumps
- pH & EC stabilization
- Optimize delivery w/ adjustable room feeding pressures
- Create recipes by nutrient content and time/day schedule
- Flush main lines before and after each watering event
- Clean-in-place settings to better manage irrigation residual
- Temperature monitoring & protection
- Remote monitoring and control

Add-on ▶

DAY STORAGE UPGRADES

Prepare reservoirs and automate monitoring and delivery schedules for more frequent feeding requirements

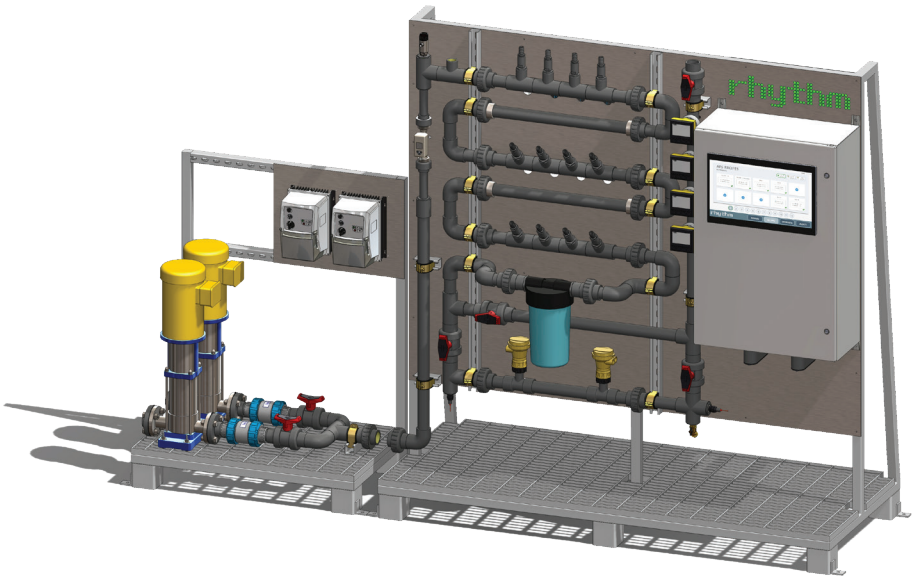
Go to page 08 ▶

ENVIRONMENT MANAGEMENT

Go to page 09 ▶

Batch Series Specifications

- 19” glove responsive touch screen
- Powdercoated steel frame construction
- Dimensions for **B200**: 55”W x 54”D x 109”H (with electric mixer). **B350**: 63”W x 66”D x 113”H (with electric mixer). **B500** tank only: 55”W x 66”D x 108”H (with electric mixer). **MB200:** 192”W x 52”D x 113”H (with electric mixers & tanks). **MB350:** 192”W x 52”D x 113”H (with electric mixers & tanks). **MB500:** 208”W x 66”D x 113”H (with electric mixers & tanks)
- 200, 350, or 500 gallon cone bottom tanks
- Schedule 80 PVC plumbing
- 2, 3 or 5HP variable frequency drive controlled multi-stage stainless steel irrigation pumps
- Diaphragm metering pumps for dosing
- 1.1, 2.8, 6.4, and 9.5 GPH dosing pumps available
- Redundant pH, EC, and temperature sensors on full featured units
- Fertigation outputs for 1” or 1-1/2” PVC plumbing, 1” PVC for fresh water input, 1” or 1-1/2” PVC for dump
- Flow meters, pressure transducers, and incoming volumetric meters included
- UL listed controls (UL508A)
- Tank level (volume) sensors with high and low level shutoff switches
- Rating for indoor use, operational temperature >32°F / <100°F
- Outgoing flow rate max 40 GPM
- Incoming fresh water flow rate 5-50 GPM
- Options for 2330V/460V/3 phase pumps/mixers
- 120/240VAC (with neutral) 40AMP (Requires 60AMP local disconnect)
- System upgrade modules require 20AMP 110/120 VAC dedicated circuit(s)
- Requires CAT5/6 ethernet network between all Rhythm controllers



2, 3 or 5HP

Variable frequency drive controlled irrigation pumps

PRECISION

Digital dosing pumps for accurate, continuous injection

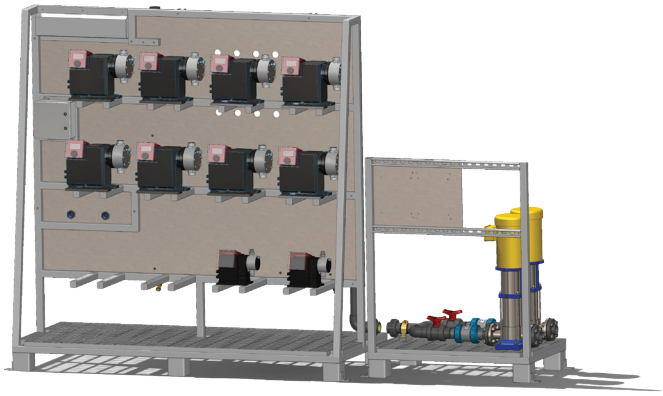
Up to 40 GPM

Feeding flow rates

INJ Inline Injection ◀ NEW

Number of nutrient injectors.....**Up to 12**
Nutrient dosing range.....**varies by flow rate**
**example 1 (@10GPM minimum dosing rate is 0.24mL/gal, maximum dosing rate is 210mL/gal)*
**example 2 (@ 30GPM minimum dosing rate is 0.08mL/gal, maximum is 70 mL/gal)*
**software includes a calculator to determine these mins and max's*
Fertigation outputs.....**up to 24**
Zones per output.....**up to 8***
Number of recipes.....**120**
Average feed times.....**driven by system flow rates**
Layout options.....**skid or non-skid**

Go to FULL SPECS



Back of the inline series skid

Standard Equipment / Features ▶

- Intuitive Rhythm AFS software
- Robust VFD controlled irrigation pumps
- Intelligent flow rate (GPM) and pressure (psi) based pump controls
- Optimize delivery with adjustable room feeding pressures
- Configurable nutrient sequencing groups
- Feed based on nutrient percentages or mL/gal ratios
- Configurable recipe 'Auto Stabilize' features
- Clean-in-place settings to better manage irrigation residual
- Temp monitoring and protection
- Remote monitoring and control

Add-on ▶

DAY STORAGE UPGRADES

Prepare reservoirs and automate monitoring and delivery schedules for more frequent feeding requirements

Go to page 08 ▶

ENVIRONMENT MANAGEMENT

Go to page 09 ▶

Inline Series Specifications

- 19” glove responsive touch screen PC interface
- Powdercoated steel frame construction
- Dimensions of main skid: 80“W x 31.5”D x 78.5“H, pump skid: 41.5”W x 24“D x 48.5”H
- Schedule 80 PVC plumbing
- 2, 3 or 5HP variable frequency drive controlled multi-stage stainless steel irrigation pumps
- Optional redundant pumping systems available
- Grundfos SMART digital dosing pumps (up to 12)
- 2.5mL/hr – 2 GPH (low) and 150mL/hr – 32 GPH (high) dosing pumps available
- Redundant pH, EC, and temperature sensors on full featured units
- Fertigation outputs for 1” or 1-1/2” PVC plumbing, 1-1/2” or 2” PVC for fresh water input, 1” or 1-1/2” PVC for dump
- Flow meters, pressure transducers, and volumetric meters included
- UL listed controls (UL508A)
- Rating for indoor use, operational temperature >32°F / <100°F
- Outgoing flow rate max 40 GPM
- Controller power required: 110/120VAC @ 20A dedicated circuit
- Pump power options: 1x200-240VAC, 3x200- 240VAC, 3x400-480VAC (amperage varies by horsepower)
- System upgrade modules require 20AMP 110/120 VAC dedicated circuit(s)
- Requires CAT5/6 ethernet network between all Rhythm controllers

DS Day Storage

Day storage reservoir size.....**no size restrictions (tanks are not included by Rhythm)**
Delivery outputs.....**customizable per reservoir**
Zones per output.....**up to 8***
Irrigation pumps.....**1 (optional)**
pH sensor.....**1 (optional)**
EC sensor.....**1 (optional)**
Temp sensor.....**1 (optional)**
Flow meter (GPM).....**1 (optional)**
Pressure sensor (psi).....**1 (optional)**
Level sensor (volume).....**1 (optional)**
PVC assemblies/valve manifolds.....**custom built (optional)**

DAY STORAGE ADD-ON

The Day Storage model is where the fertigation system prepares "day storage" reservoirs (often called "batch tanks") rather than direct feeding plants. With Rhythm's Day Storage upgrades, these reservoirs come to life in the software for all monitoring, recirculation, and delivery schedules from the reservoirs to the plants. Day Storage upgrades require Rhythm Day Storage Controller(s), and can include optional VFD controlled irrigation pumps, pH/EC/Temp sensors, Flow Meters, Pressure sensors, and reservoir level sensors. Options for Rhythm-built PVC assemblies and valve manifolds are also available. All Day Storage upgrades are compatible with any size/type of reservoir (not provided by Rhythm).

GOOD FOR ▶

Growers with high-frequency irrigation requirements that would be limited by a direct feeding model (system bandwidth limitations). Often these growers are adopting crop-steering methodologies.

Build Your Environment Controller

ENV

L Lighting Control

Control options.....**ON/OFF, dimmability, spectrum**
Units measured.....**PAR, DLI**
Output range.....**0-10V (sink/source), Digital**
Zones per room.....**up to 6**
Sunrise/sunset features.....**yes**
Safety & emergency power settings.....**yes**
Lighting types.....**LED, HPS**

T Temperature/HVAC Control

Control options.....**Thermostat, BACnet (IP or MSTP), Modbus (TCP or RTU)**
Units measured.....**°F/°C**
Number of daily setpoints.....**6**
Configurable safety settings.....**yes**
Operating range.....**40°F to 100°F**

RH Humidity Control

Control options.....**Dry contact, contactor ON/OFF, BACnet**
Units measured.....**% RH**
Number of daily setpoints.....**6**
Operating range.....**0 to 100% RH**
Configurable staging options.....**yes**

CO_2 CO_2 Control

Control options.....**ON/OFF (24VAC or 120VAC), BACnet**
Units measured.....**ppm**
Number of daily setpoints.....**6**
Configurable safety settings.....**yes**

F/E Fans/Exhaust Control

Control options.....**ON/OFF, 0-10V, 4-20mA, BACnet**
Units measured.....**%**
Number of zones per room.....**up to 3**
Number of daily speed setpoints.....**4**
Output range.....**0-100%**

SM Soil Moisture Measurement

Control options....**SDI-12, Integration options available**
Units measured.....**VWC, EC, temperature**
Sensor options.....**wired and wireless**
Dryback reports.....**yes**
Safety& alert settings.....**yes**

TEMP/RH/CO_2

AMBIENT SENSORS

Dual channel 3-in-1 sensor measures room temperature, humidity and CO2 with industry leading accuracy. Use multiple ambient sensors across large grow areas to track conditions and quickly spot any variations that occur across the growing space.

PAR/DLI

LIGHT SENSORS

Apogee full-spectrum quantum sensors provide precise PAR/PPFD measurements. Safety features in the software monitor PAR values to confirm lights are responding to control commands (i.e. ON or OFF periods).

DRY BACK

MEDIA SENSORS ◀ NEW

Soil Moisture sensors penetrate the growing medium and provide real-time measurements of Volumetric Water Content (VWC), Electrical Conductivity (EC), and Temperature. Safety features in the software provide alerts and (optional) automated irrigation events to keep plants stable.

Smart Environment Control Software

Can my device be controlled?

Control of your devices can be accomplished as long as the device has an avenue for third party control. As Systems Integration experts, we can help you determine the requirements and/or limitations for control of each component in your facility. Brands we have worked with include Daiken, Trane, AAON, Captive Aire, Anden, Quest, Fluence, Fohse, Gavita, and more (contact us about your specific integration requirements).

How many sensors do I need?

One sensing point for Temp, Humidity, and CO2 is all that is required to control your rooms. However, the Rhythm system will allow for up to (6) sensing points for Temp, Humidity, CO2, and PAR in each room. The ideal quantities of each can be influenced by the type of room (i.e. Flower rooms vs Dry rooms), the size of rooms, and the number of vertical tiers.

How do I manage my schedules?

Rhythm uses weekly "recipes" to manage environmental setpoints. These recipes include Day and Night Setpoints for Temp, Humidity, and CO2, as well as the desired lighting intensity levels (dimming percentages). Each room can be scheduled up-to 15 weeks in advance, and features in the software allow for up-to six daily setpoints to be managed (i.e. eliminate humidity spikes when lights go OFF by lowering VPD levels before sunset).

EQUIPMENT CONTROL

- Lighting dimmability & spectrum control (up to 6 zones per room)
- Up to 6 programmable set points for temp, RH, & CO_2 per day
- Greenhouse control options available for supplemental light, shade curtains, wet walls, etc.
- User configured dehumidifier staging
- Manage up to 3 fan speed zones per room

INTEGRATED SOFTWARE

- Run schedules in auto or hold setpoints in manual mode
- Put rooms in "not active" state when harvested to avoid running devices unnecessarily
- Spray Mode available to assist in managing foliar spray processes
- VPD display with room status and alerts
- Activate/deactivate sensors and set sensors offsets

SAFEGUARDS

- Remote access from anywhere
- Receive alerts for critical deviations and light interruptions
- Locally hosted software that does not rely on the internet
- Configurable safety events
- High CO_2 or Temp safeguards
- Emergency Power Mode: Lower light intensity in all rooms when facility is on backup power mode

Analyze Your Grow Data

DATA

520 million+

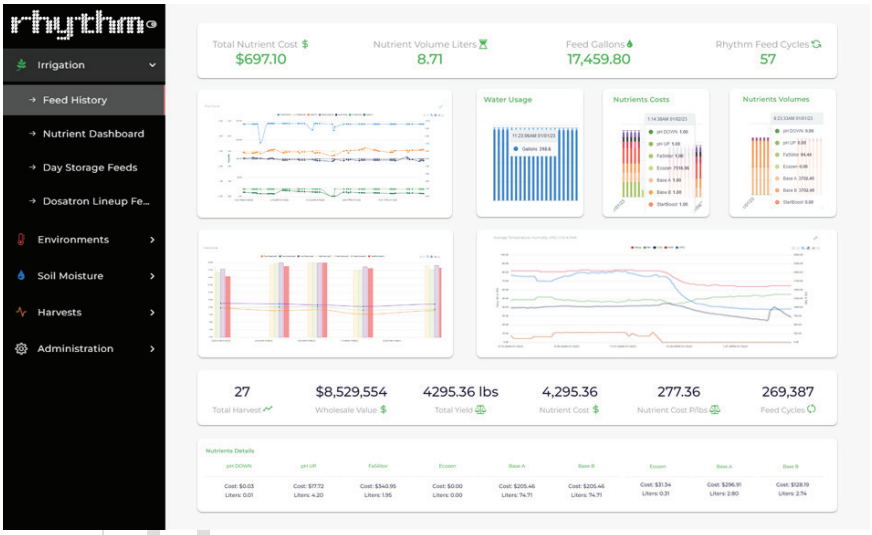
Gallons fed by our customers across North America

over 3 million+

Rhythm cycles run

2,500+

Data points logged per day per room



- Included with every system, accessed via our secured website
- Historical data for the life of your facility
- Track fertigation events and associated nutrient and water costs
- Environment trends for temp. RH, VPD, CO_2 & PAR
- Media sensor trends for VWC(%), EC and temperature
- Numerous filtering, layering, and exporting options

Understanding your crop data can help drive down operational costs and increase profits. With Rhythm Analytics, we provide you with the data, visualization, and filtering tools to drive operational excellence and maintain a competitive advantage. Using the full analytics program, you can analyze performance trends in your facilities environments, or the costs of your fertigation programs, to take your business from a reactive state to a proactive one.

FEED & NUTRIENT HISTORY

- View fertigation reports for feeding times, volumes, pH, EC, & temp levels
- Compare setpoints vs. actual values
- View nutrient usages in liters
- View nutrient & water costs per room, event, date range, or harvest cycle
- Track system flow rates to determine irrigation health and/or maintenance requirements

ENVIRONMENT HISTORY

- View historical trends for temp, humidity, CO_2, and PAR
- Layer your trends to view specific data
- Track when and where deviations occur
- Monitor system performance
- Analyze how environments affect yields

HARVEST ANALYSIS

- What is my nutrient cost per harvest?
- How much does each recipe cost me?
- Do certain nutrients increase yield?
- Do different strains cost more to produce?
- Which changes in environment affect yield?
- Which rooms achieve greatest yield per nutrient cost?

Portfolio Examples

MICHIGAN

Custom Single Batch Series AFS for a client with tight water room restrictions. This system was designed to optimize the use of the space.

MASSACHUSETTS

This customer has a very large facility that feeds 11 rooms, each up to 30 times per day, utilizing our 500G Multi-Batch with upgraded Day Storage Manager.

MICHIGAN

This customer is utilizing a custom designed 350G Multi-Batch with 3hp pumps and a custom Clean in Place procedure utilizing ozone.

OHIO

This fully integrated system is designed to support a 4x expansion in future phases.

CALIFORNIA

This large facility utilizes redundant 5hp irrigation pumps, custom integrated filters, and a custom VEG Day Storage Manager.

ARIZONA

This facility has a custom-built mezzanine for easy access to 10 total Day Storage Reservoirs.

UNCOMPROMISED COORDINATION

Rhythm provides a Project Manager who will supply a coordination document set that outlines the entire Rhythm scope for your facility. This includes equipment layouts, power/plumbing requirements, integration and networking requirements, etc. We will meet with your GC team to ensure the planning and commissioning of your facility runs smoothly.

UNCOMPROMISED SUPPORT

We are proud to offer personalized, premium support for the life of your facility. From project management, to on-site startup and commissioning, to continued educational, troubleshooting and maintenance, the Rhythm Support team is always available to help ensure your success.

UNCOMPROMISED INDUSTRIAL COMPONENTS

Assembled in the USA with only the highest quality of industrial components, the hardware in our solutions go through a stringent testing requirement and are designed to withstand the demands of long-term commercial agricultural use. A 1-5 year warranty is available on all system components.

rhythm®

Call us: 833-749-8461
Email us: sales@rhythmcss.com
Visit us: https://www.rhythmcss.com
DM us: @rhythm_css