

# Seed



*Seed is a remarkable touchscreen climate control with a user interface that makes managing complex growing environments child's play. Engineered for power; designed for ease.*

Find out more



 **WADSWORTH**  
Control Systems



# Seed

## Climate control with accessibility and power

*Seed combines the accessibility of an intuitive touchscreen interface with the expansive power of the Seed I/O input and output system, providing exact information at a glance.*

### BENEFITS

- Improve the yield and quality of your crop
- Increase labor and energy efficiency
- Intuitive interface accommodates beginners and experts

### FEATURES

- Graphic interface provides extensive information at a glance
- Advanced humidity control
- Zone screen displays comprehensive information for each zone including:
  - Current sensor and equipment status
  - Displays explanation for equipment status including anticipated changes
  - Select view to display equipment response based on temperature or humidity
  - Quick access to graphs, setpoints and equipment settings
  - Bulk override allows user to quickly turn on or off multiple equipments
  - Zone profiles save settings for seasonal or crop transitions
- Individual alarms for each sensor
- Graph data can be viewed from weeks to minutes and any thing in-between
- View any zone at your facility, from any Seed control
- Zones in alarm are easily identified on the home screen
- View outside weather data
- Background reflects day, night, rain or snow conditions
- Adjust settings, limits, overrides and view status on individual equipment screen

### NEW IN VERSION 2

- Browser-style navigation for quick access
- Easily adjust settings using sliders or direct entry
- HE Anderson Fertigation Interface
  - Configure zone-specific recipes and schedules
- Customize which zones are displayed and sensor readings within each zone
- User Profiles with three different levels of access
- User tracking system logs who made changes and when
- Influences mode allows custom equipment responses specific to your needs
- Custom programmed to include all your equipment
- View and adjust settings from the app, Sphere software or at the control
- Sensor Pools Screen allows calculated responses involving multiple sensors including:
  - Vapor Pressure Deficit (VPD), Daily Light Integral (DLI), Wet Bulb Dry Bulb Relative Humidity
  - Allows for averaging multiple sensors over time

*"Seed is so easy to use – it's plug and play."*

— John McMahon,  
Schuyler Greens



# Seed Sphere

*Make your Seed control more powerful than ever. Seed Sphere expands Seed's capabilities and gives you a better way to see your growing world.*

*"I am impressed with how tightly Seed can control equipment. Wadsworth has very specific, dialed-in abilities to manage the crop"*

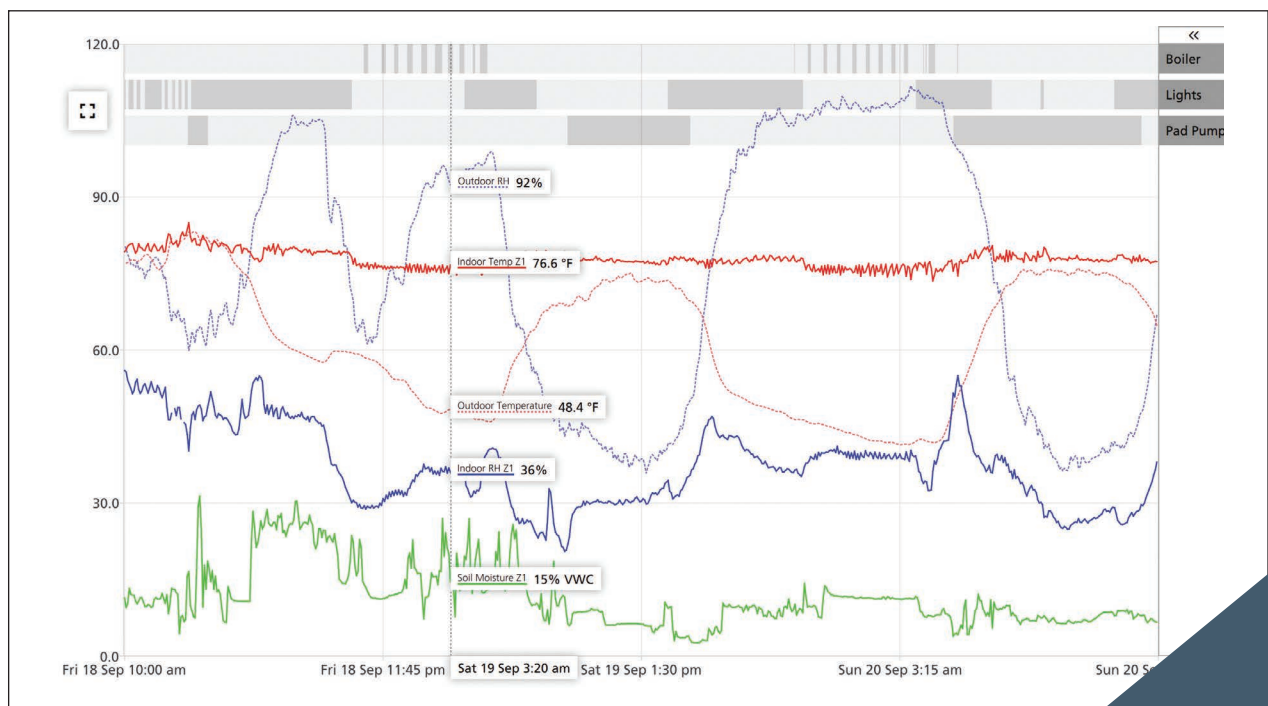
— Anthony Brach,  
Local Roots

## FEATURES

- View and change any setting using Sphere and your Mac or PC
- Back up and restore your Seed control's settings
- Enhanced graphing functionality including:
  - Quick Reports (User saved reports for easy access)
  - Ability to analyze all zones, sensors, equipment on one graph
- Export data to Excel or CSV, database, or any analysis tool
- Create multiple zone profiles for seasonal changes
- Live data readings
- Customizable alarm notifications

Requirements: Mac OSX or Windows 10 ( 4-bit)

## QUICK REPORTS





# Seed I/O

## *Flexible, strong and supportive: The perfect partner*

*The key to Seed's adaptability is Seed I/O. Sensors send readings to the Seed control, which sends directives to equipment based on user settings. Sensors communicate with Seed I/O inputs, equipment communicates with outputs.*

*"People think greenhouse growers don't think about the weather but it's important to review the graphs and see how the environment is responding to outside conditions."*

— John McMahon,  
Schuyler Greens

## FEATURES

- Ports can be assigned to any zone
- Add additional Seed I/Os after the project has been installed
- Pre-wired for easy installation
- Flexible options to meet your needs:  
Seed I/O comes in a variety of sizes and configurations
- 0-10v connections
- Lightning protection on both RS485 ports
- Overvoltage protection on all sensor inputs
- Toggle switches for manual override.
- Certified
  - Professionally designed UL Certified Industrial Control Panels
  - NEMA 4 enclosures
- Sensors
  - Temperature and humidity aspirator
  - Weather station with PAR light sensor, wind speed and direction, outdoor temperature and humidity and precipitation.
  - Temperature Probes for Boiler Supply/Return, Chiller Supply/Return, Slab/Water, Soil or Bench temperatures
  - Soil moisture
  - pH/EC & Dissolved oxygen sensors
  - CO<sub>2</sub> & CO sensors
  - Wet bulb/Dry Bulb Relative Humidity
  - VPD & DLI Calculations
  - Light Sensors – Full Spectrum PAR



# Wadsworth.Cloud

Bring the power of Seed control home

## FEATURES

- Access the app on your iOS, Android or computer for quick and easy changes to your settings
- Continually saves your settings
- Historical data is backed up to the Cloud
- Manage multiple sites – great for consultants
- Subscription based
- Select snapshot schedules and number of users to suit your needs
- No third-party software required
- Real time alarm notifications
- System disconnect alert if your site loses connection to the Cloud
- Cloud access user management: control who can access remotely
- Track changes to settings made remotely by users

*"The Cloud has been an incredible tool that gives me full access anywhere I go. Not only have I been able to make adjustments while away from work, but I've also been able to see conditions and ensure all systems are working during blizzards when our roads are closed and I can't get to the school. We've even been able to detect power outages and empty propane tanks before it was too late!"*

— Eric Sawatzke  
West Central Area ISD  
Agriculture Instructor



Find out more

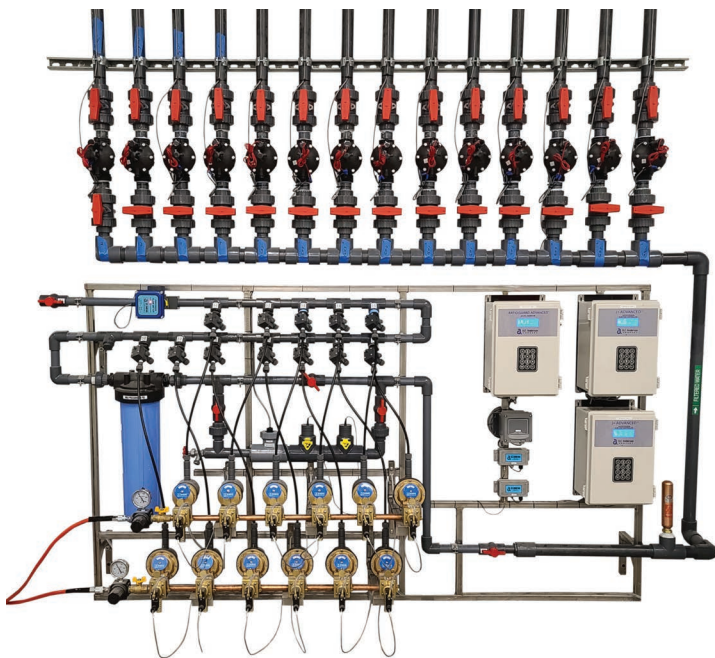


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# Fertigation

## Dynamic Duo

*Wadsworth is teaming up with H.E. Anderson to simplify your crop management. Seed®, Wadsworth's innovative touchscreen control now has the capability to manage fertigation needs with Anderson's J+ Advanced Ratio:Feeder® Controller.*



## FEATURES

- Option to connect one or multiple fertigation systems to Seed
- Valve grouping allows linking multiple valves into a variety of groups using programming
- Create unlimited recipes, including notes
- Trigger irrigation events based on a schedule, time, VPD, accumulated light, soil moisture or a combination
- Ability to run off a Fill Tank. Can be linked to irrigation for continuous topping off with a specific nutrient recipe.
- Flush valve linking allows flushing lines after an irrigation/fertigation event, reducing bio-film
- Pulse irrigation allows the grower to add pauses during irrigation events to reduce runoff
- Contact us about upgrading your existing system



# Sensors

## Seed never sleeps

*"This is the most intuitive control I've ever seen. It speaks to my generation."*

— Andy Sack

*More information gives Seed more power and you more control. Sensors add value to your Seed control as constant monitoring guides greenhouse climate management. The result is improved crop yield and quality, reduced energy consumption and lower environmental impact. Sensors reduce microclimates, improve pest management effectiveness and result in a consistent crop.*

## OPTIONS

Use your equipment to its maximum potential by responding to a variety of data sets.

- Temperature – Readings inside and outside the greenhouse provide rapid measurements
- Humidity – Relative humidity readings from indoors and outside the greenhouse allow the controller to make informed decisions about how to regulate humidity
- Exclusive to Seed – high humidity sensor. Perfect for propagation of any high humidity environment with an operating range of 0-100%.
- Anemometer and wind direction – Measures wind speed and direction and data is used to determine when to open and close vents.
- Light PAR – Modulating lights – use PAR sensor at crop level to check amount of light received from the sun – and modulate lights up or down in intensity to provide proper micromole level for the crop. Reduces energy usage of the light as well as your cooling system.

- Precipitation – Combined with temperature sensor to protect structure from heavy snows, informs venting decisions
- CO<sub>2</sub> (carbon dioxide) – Essential component of photosynthesis. Needs to be monitored for alarm conditions
- PH (acidity and alkalinity); EC (electrical conductivity); DO (dissolved oxygen) – Used in all mediums including aquaponics and deep water culture for logging, monitoring and alarms.
- Barometric Pressure – Keeps pathogens out or butterflies in by using fans to maintain a positive/negative pressure in zone.
- Soil Moisture – Irrigation trigger or, backup trigger to keep the crop from wilting
- CO (carbon monoxide) – Monitors boiler rooms for alarm status

External sensors – Wadsworth's Weather Station configured to meet your needs with temperature, humidity, wind speed and direction, and light readings. protecting the structure, from wind, poor outside conditions, vacuum and wind, if really cold, but also really cloudy, use sensor to cover crop and turn on grow lights. Use lights as heat and use curtain to maintain temp.

Find out more



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# Predictive Weather

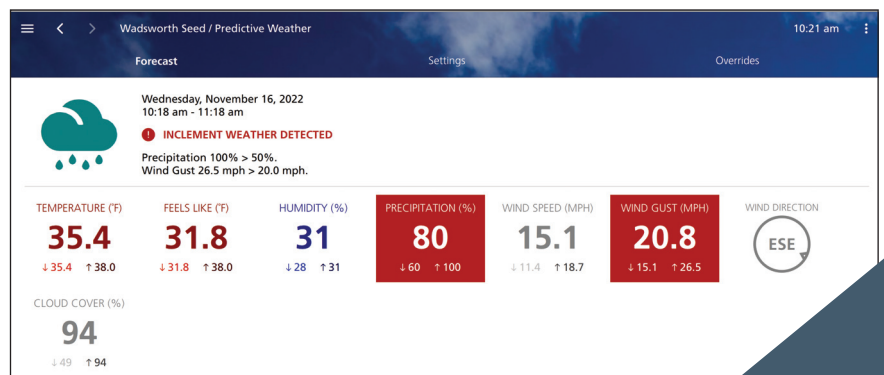
*You may not be able to see into the future, but we can. Our Predictive Weather subscription makes certain your Seed control knows the storm is coming before it arrives, allowing time for equipment to make needed adjustments to protect your structure and crop. Whether you're onsite or not, Seed has your back.*

*"Predictive Weather is a great system. The basic features are streamlined and easy to learn. We wanted more control, so we added the ability to have continued airflow on the downwind side of the structure during strong winds."*

— Tyler Whitley  
Head Grower, Station 10  
Bonnie Plants

## BENEFITS AND FEATURES

- Uses an enterprise-grade weather service for accurate and reliable forecasting
- Accesses the local forecast—based on latitude/longitude—for upcoming inclement weather
- Proactively close vents, turn off fans, and adjusts other outdoor-facing equipment when inclement weather is detected
- Reacts to anticipated shifts in temperature, humidity, precipitation, wind speed, wind gusts, and cloud cover
- Backup and supplement for an on-site Weather Station, including alarm activation when needed
- Requires external internet access
- Allows you to define time span of forecast
- Alarms
  - If forecast is unavailable
  - Specific alarm for inclement weather
- Requires wadsworth cloud



Find out more



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# Soil Analyzer

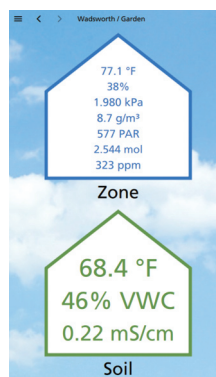
*Introducing the Soil Analyzer, an advanced soil sensor that's a game changer for all growers.*

## BENEFITS

- Reads soil temperature, moisture, and electrical conductivity (EC)
- Create sensor alarms to protect your plants from unforeseen events
  - Temperature, soil moisture, and EC
- Sensor data can be graphed for analysis
- Adjust watering frequency and duration with the soil moisture sensor
- Monitor root zone temperature to optimize floor or bench heat settings
- View EC trends to fine tune nutrient recipes
- Readings can be pooled with other sensors, associated to equipment, used in influences, and more
- Probes connect to second com port and don't require additional sensor inputs
- Multiple Soil Analyzers can be connected through a network

## REQUIREMENTS

- Seed V2 v2.01.13 or greater
- Seed I/O firmware V 3.02 with available com port
- 24VDC 0.25A power



Wadsworth / Sensors and Equipment 7:45 am

Hardware Sensor Pools Equipment Groups Schedules Influences Modbus

Modbus Devices

Search...

Add Modbus Device

Name	Device	I/O	Address
Soil	Soil Analyzer	Seed I/O 11 on Garden	1

Modbus Sensors

Search...

Name	Value
Soil / Nutrient EC	0.22 mS/cm
Soil / Soil Moisture	46% VWC
Soil / Temperature	68.0 °F

Find out more



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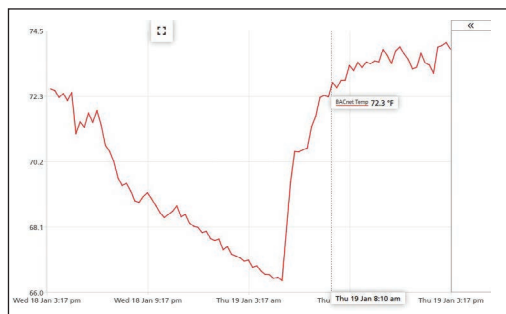
## BACnet *Read-Only*

*Seed and BACnet devices can now exchange information allowing you to view multiple sources through a single interface.*

Seed can read external BACnet devices, and BACnet devices can view the controller's sensors and equipment. Seed and BACnet devices must be on a shared network.

- Seed uses BACnet IP to communicate with other devices
- View properties of any BACnet device on the network
- Graph data from BACnet Analog/Binary Inputs and Outputs
- Use a BACnet sensor as a sensor in Seed
- View Seed's sensors, equipment, and setpoints over BACnet
- Receive Seed alarms over BACnet
- Integrates with building management systems (BMS)

**Graph of external BACnet temperature sensor**



**External BACnet binary output**

Hardware	Sensor Pools	Equipment Groups	Schedules	Influences	BACnet	Modbus
Device ID *	Device Name	Description	Vendor Name	Address		
37	Seed	Seed Controller	Wadsworth Control Systems	192.168.0.55		
277050	DEV277050	Functional Devices BACnet RIB	Functional Devices, Inc	2001:50		

BACnet Objects:			
Search...			
Object ID *	Object Name	Description	Name
binaryInput:1	BI1	Binary Input 1	[UNUSED]
binaryOutput:1	BO1	Binary Output 1	Binary Output 1
device:277050	DEV277050	Functional Devices BACnet RIB	-

Properties:	
Search...	Refresh Properties
Property *	Value
Active Text	Active
Description	Binary Output 1
Event State	Normal
Inactive Text	Inactive
Minimum Off Time	0
Minimum On Time	60
Object Identifier	[Binary Output, 1]
Object Name	BO1
Object Type	Binary Output
Out Of Service	false
Polarity	Normal
Present Value	Inactive
Priority Array	[Null, Null, Null, Null, Null, Null, Null, Null, Null, Null, Null, Null, Null, Null]
Reliability	No Fault Detected
Relinquish Default	Inactive
Status Flags	[]

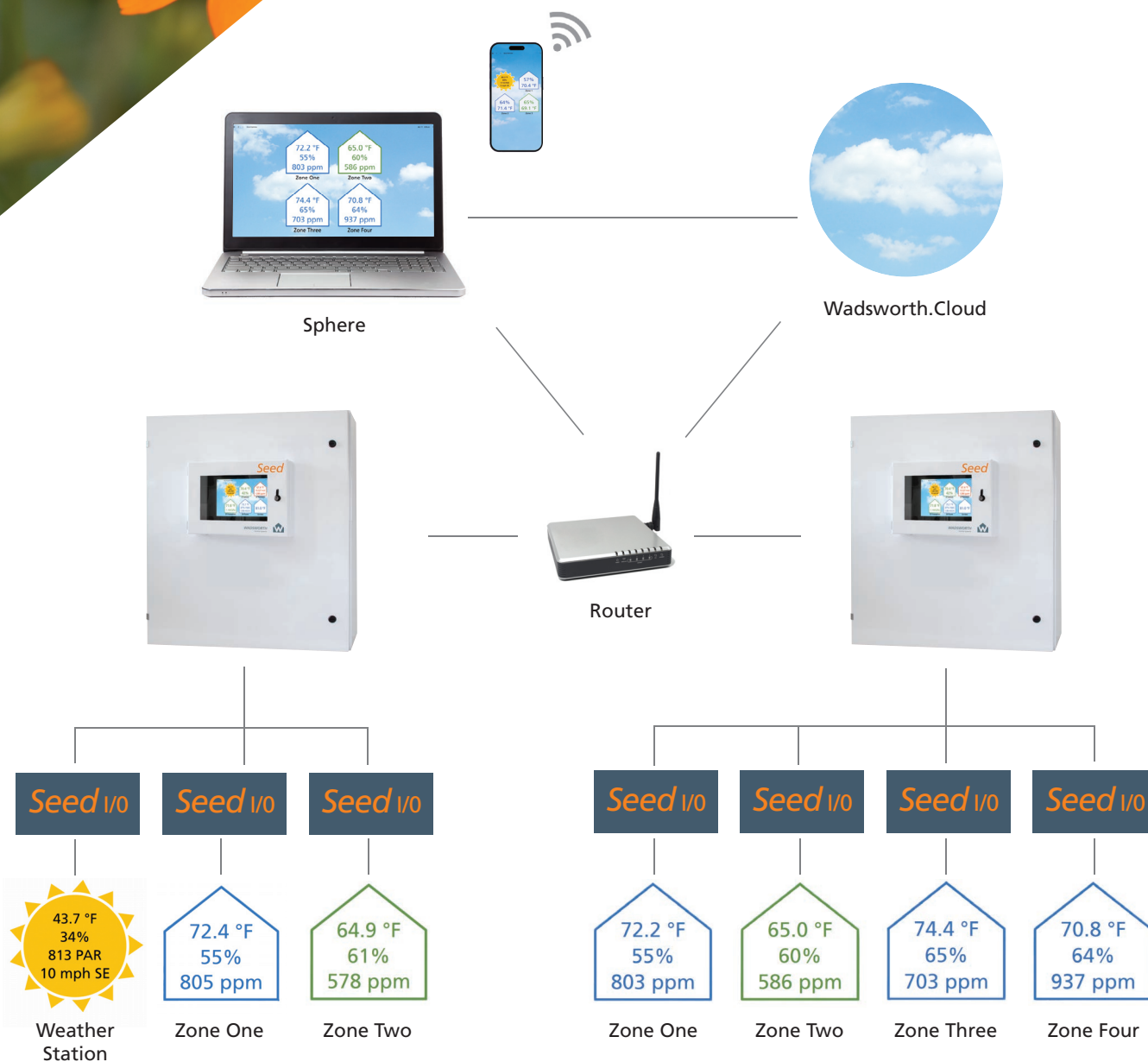
- BACnet devices can be mapped into Seed:
  - Analog Input -> Sensors
  - Binary Input -> Detector
  - Analog Output -> Modulating or 2 Relay Equipment
  - Binary Output -> 1 Relay Equipment
- Seed can be mapped to BACnet devices:
  - Sensors and Sensor Pools -> Analog Input
  - Detectors -> Binary Input
  - 1 Relay Equipment -> Binary Output
  - 2 Relay and Modulating Equipment -> Analog Output
  - Active Setpoints -> Analog Value
  - Alarms -> Multi State Inputs
  - Alarm Groups -> Notification Class

**Find out more**



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# Seed Configuration



Find out more



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