



RAYN Syrcadia Software RAYN Touch Controller User Manual

Version 2.2.0

Part Number: 7437M1210-2.2.0 Rev: A

Released: 2023-11

To view a list of trademarks and patents, go to rayngrowingsystems.com/ip.

All other trademarks, both marked and not marked, are the property of their respective owners.

RAYN Growing Systems intends this document, whether printed or electronic, to be provided in its entirety.

Table of Contents

RAYN Touch Lighting Controller	1
Getting Started with RAYN Syrcadia	1
RAYN Syrcadia Settings	2
Settings > Preferences	2
Preferences > Basic	3
Preferences > Remote	5
Preferences > Network	5
Preferences > Special	7
Settings > Zones	7
Settings > Devices	8
Devices > Add Device	10
Devices > Remove	11
Devices > Show Universes	11
Devices > RDM	12
Settings > Outputs	13
Settings > Sensors	13
Add Existing Sensors	14
Add New Sensors	14
Settings > Setpoints	15
Adding and Editing Setpoints	15
Using Setpoints	15
Settings > Functions	16
Using Functions	17
Adding and Editing Functions	17
Settings > Files	20
Files > New	20
Files > Open	21
Files > Save	21
Files > Save As	21
Files > Config Files	22
Files > Advanced	23

RAYN Syrcadia Dashboard	25
Dashboard > Notifications	25
Dashboard > Zones	26
Zone Control and Indicators	27
Zones > Sensors	27
Zones > Sensors Chart	28
Zones > Manual	29
Zones > Spectrum	35
Zones > Overrides	36
Zones > Day Plan	37
Creating and Editing Day Plans	37
Zones > Crop Plan	39
Zones > Scheduler	40
Scheduler > Real Time & Automatic	42
Scheduler > Advance	42
Scheduler > Go to	43
Scheduler > Start at	43
RAYN Syrcadia Remote	44
Connecting to RAYN Syrcadia	44
PIN Codes	44
Using the Remote	44
Overrides Menu (Star Icon)	45
Zone Overview	45
Sensors	45
Scheduler	45
Spectrum	46

RAYN Touch Lighting Controller

RAYN Touch is a multi-zone lighting controller running RAYN Syrcadia software that can be used to define and activate spectra containing multi-waveband lighting fixtures, dimmers and relays. The system can connect to various sensors and report their feedback. The system can activate spectra manually, by timed event programming in a day or crop plan, or by override. It can calculate daily light integral (DLI) values based on sensor feedback and control the overall lighting of a zone to maintain a target DLI as set by the user.

Select **Help** and then choose an on-screen tab title or button to see a description of that function or display. Areas that provide help text are highlighted.

Navigate the help system by selecting links embedded in the text to access more information. Use the **Home** button to return to this page. Use the **Back** button to page back through texts that have already been displayed since activating help. Use the **Close** button to exit the help system and return to RAYN Touch.

RAYN documentation and technical support are available via our website, rayngrowingsystems.com, or by calling us at +1 (844) 907-7296.

RAYN documentation and technical support are available via our website, or by calling us at +1 (844) 907-7296.

Getting Started with RAYN Syrcadia

RAYN Touch running RAYN Syrcadia software is an advanced real-time controller for multi-waveband lighting fixtures in addition to other devices such as dimmers and relays. It requires a connection to devices it is meant to control. This connection is made either via Ethernet-based protocols (sACN and Art-Net) to lighting fixtures or converters or by direct use of DMX512A signal. When using multi-waveband lighting fixtures, RAYN Syrcadia needs to know of and understand the wavebands available in those fixtures.

RAYN Syrcadia software can also be run on a Windows PC.

RAYN Syrcadia offers a library of fixtures to choose from, or new fixtures can be requested by contacting your RAYN Growing Systems provider.

- [Set the date and time](#)
- [Create zones](#)
- [Connect a device to RAYN Touch](#)
- [Connect sensors to RAYN Touch](#)
- [Manage RAYN Touch configuration files](#)
- [Create and save a spectrum](#)
- [Activate the saved spectrum](#)
- [Create and use Overrides](#)
- [Create a day plan](#)
- [Create a crop plan](#)
- [Use the Scheduler](#)
- [Use the RAYN Touch Remote app](#)

RAYN Syrcadia Settings

Settings within RAYN Syrcadia include definition of zones, connection of devices and sensors to the RAYN controller or RAYN Syrcadia PC and assignment to zones, file management and preferences.



Note: *Devices must be connected to RAYN Touch in the Lighting tab before they may be used.*

- [Settings > Preferences](#)
 - [Settings > Zones](#)
 - [Settings > Devices](#)
 - [Settings > Outputs](#)
 - [Settings > Sensors](#)
 - [Settings > Setpoints](#)
 - [Settings > Functions](#)
 - [Settings > Files](#)
-



CAUTION: *Settings should be altered with care by a trained person. Incorrect settings can impair or disable correct operation of the controller or the lights attached to it.*

Settings > Preferences

The Preferences tab contains tabs for all the basic settings for RAYN Syrcadia on the RAYN Touch controller or PC, including date and time, DMX speed, units preferences, network protocol settings, controller backlight and name settings, and remote control PIN settings. These settings are stored on the controller itself and not in the configuration file.

The following tabs are available:

- [Preferences > Basic](#)
- [Preferences > Remote](#)
- [Preferences > Network](#)
- [Preferences > Special](#)

Preferences > Basic

The screenshot shows the 'Settings' window for 'RAYN Config 1' at 11:55 am. The 'Preferences' tab is active, and the 'Basic' sub-tab is selected. The settings are organized into several sections: Date and Time, DMX Speed and Sensor Refresh Rate, Backlight, Controller name, and a list of checkboxes for Device detection (RDM), Show seconds, and Dark Theme. The 'Auto-resume from Manual' section includes a checkbox for 'At midnight' and a text input for 'After minutes' (0). The 'CSV export: Decimal character' is set to 'Point (.)'. The bottom right corner displays 'Software Version:', 'Library Version:', and 'IP Address:'.

The currently-installed software and library versions can be found in the bottom right, along with the current IP address of RAYN Touch or RAYN Syrcadia on PC.

Date & Time



Note: RAYN Syrcadia on PC will use the time, date, and network IP and subnet settings from Windows. The settings in Preferences will only alter the time and date formats used within Syrcadia.

Date and time settings include the format and the actual date and time. Time settings must be made before real time day plans can be run properly.



Note: The date setting is used in file management to date stamp config files and sensor logs.



Note: USA dates follow the format month-day-year, while European dates are formatted day-month-year. Be sure to note the format you have chosen when observing the displayed date.

1. Select the date format cell to change the date format. The cell will display the currently set format.
2. Select the **Set** button beneath the date format to set the current date.
3. Select the time format cell to change the time from 12 hour to 24 hour format. The cell will display the currently set format.
4. Select the **Set** button beneath the time format to set the current time.

°F/C

This setting determines whether temperature sensor data is displayed in degrees Fahrenheit or Celsius. Defaults to Fahrenheit.

DMX Speed

Some third-party DMX devices occasionally do not accept a full-speed DMX signal. This may result in flickering or other misbehavior. This setting can be used to slow it down to a suitable speed.



Note: *When using only devices made by RAYN Growing Systems the DMX speed should be set to Max.*

Sensor Refresh Rate

To set the rate at which RAYN Syrcadia refreshes sensor data, choose 5 seconds, 1 minute, or 20 minutes from the menu.

Backlight

The screen backlight can be set from 1 (dim) to 7 (bright).



Note: *On RAYN Syrcadia on PC, this setting will adjust the brightness of the Syrcadia window.*

Controller Name

The controller name is included in exported log files. See [Settings > Files > Advanced > Export Sensor Logs](#) for more information.

Select this cell to enter a name for the RAYN Touch controller / RAYN Syrcadia PC. This is highly recommended when using multiple RAYN Touch controllers.

Device detection (RDM)

It is possible for RAYN Syrcadia to find RDM-capable luminaires automatically and add them to the Lighting tab directly. See [Settings > Devices](#) for more information.

To enable or disable RDM communications, check this box. Defaults to disabled.

Show seconds

To enable or disable seconds on the clock display and in day plan programming within RAYN Syrcadia, check this box. Defaults to disabled.

Dark Theme

RAYN Syrcadia can be run in a dark theme or light theme, depending on the lighting environment of the controller or PC. Light theme is the default. Check this box to change to the dark theme.

Auto-resume from Manual

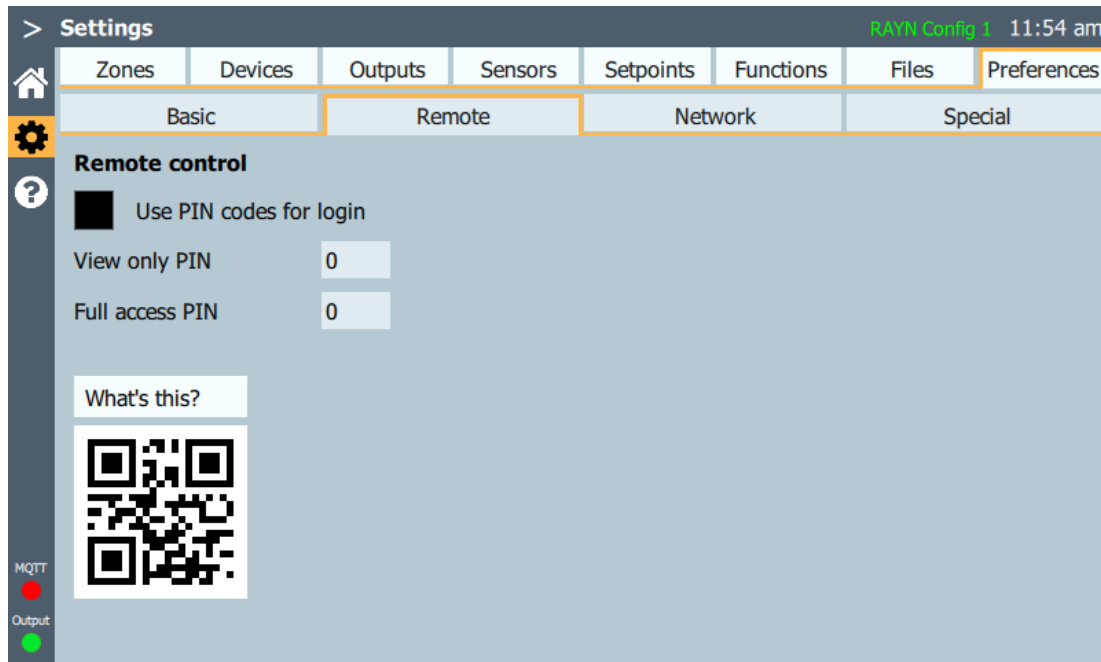
RAYN Syrcadia will not automatically resume when light levels are set manually. To trigger an automatic resumption of scheduled events, check the **At midnight** box or enter a number of minutes (from 1-59) after which the scheduler should reassert itself.

CSV export: Decimal character

Use the dropdown menu to use point (.) or comma (,) delimiters when exporting CSV files. See [Files > Advanced](#).

Preferences > Remote

You can remotely access and control portions of your RAYN system via the [RAYN Syrcadia Remote](#). This tab controls settings for the remote connection.



Use PIN codes for login

PIN codes can be used to limit the available interactions with RAYN Syrcadia when using the RAYN Syrcadia Remote from a connected web browser.

When this setting is enabled, one of the two PINs below will need to be entered when the app is opened in order to use the remote. When disabled, no PINs are required. Defaults to disabled.

PIN codes are limited to four digits or fewer.

View only PIN

This setting sets the PIN code to allow view-only remote access to RAYN Syrcadia.

Full access PIN

This setting sets the PIN code to allow full remote access to RAYN Syrcadia.

QR Code

The QR code contains a link that opens the RAYN Syrcadia Remote app in a web browser. Any mobile device on the same network as the RAYN Touch controller or PC can connect using this QR code.

The **What's this?** button above the QR code opens the [RAYN Syrcadia Remote](#) help page.

Preferences > Network

Network settings are required if the control signal is being distributed over an Ethernet network to gateway devices.

The screenshot shows the 'Settings' window for RAYN Syrcadia. The 'Network' tab is selected. Under 'Network Output Protocol', 'Streaming ACN' is chosen. 'Streaming ACN Priority (0-200)' is set to 100. 'Network Universes' are mapped 1:1 from 1 to 12. 'Network Interface' shows 'MQTT Broker' at '127.0.0.1' with a green status indicator. The top bar shows 'RAYN Config 1' and '11:51 am'. The left sidebar has icons for Home, Settings, MQTT, and Output.

Network Output Protocol

Select this cell to set either Streaming ACN (sACN) protocol or Art-Net protocol. The cell will display the currently set protocol.

Streaming ACN Priority (0-200)

Use the field to enter an sACN priority level. Defaults to 100.



Note: This field will only appear if Streaming ACN is selected as the network output protocol.

Network Universes

This mapping allows the internal universe assignments 1-5 to be mapped to other universe numbers within an Ethernet protocol. The default is a one-to-one mapping.

Network

In larger systems DMX control data may be transported over a standard TCP/IP Network. It is advised to leave the Auto box checked unless you know how to address your network devices.

With Network set to Auto, addressing will take place as follows:

If a DHCP server is present on the network, it will automatically provide an IP address in its predefined address range. The controller will be able to communicate levels to any device in that same address range.

If no DHCP address server is present the unit will adopt a 'link local' address in the range 169.254.xxx.xxx. Again, the controller will be able to communicate levels to any device set in that same address range.

Network Interface

Use this setting to confirm the Ethernet connection RAYN Syrcadia should use for communication with the lighting system.



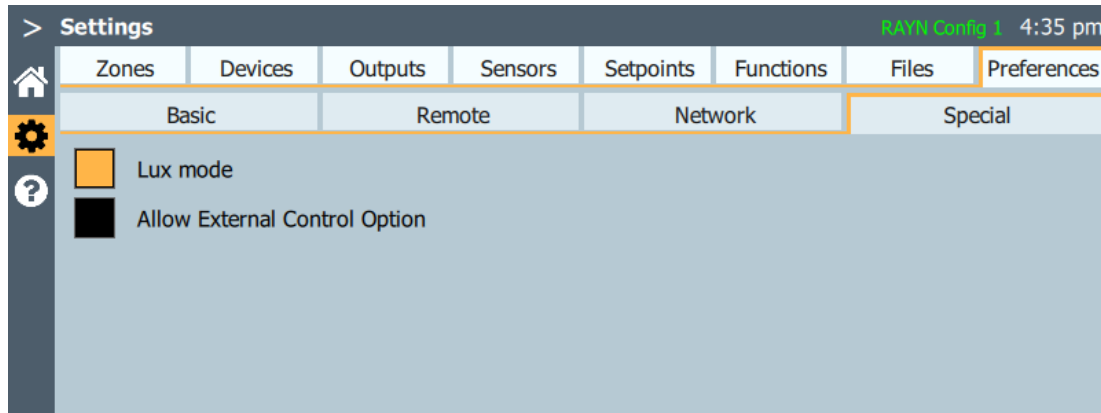
Note: *This is the only option available in [Settings > Preferences](#) when RAYN Touch Syrcadia is running in base mode.*

MQTT Broker

These settings allow you to configure an MQTT broker for use with [Settings > Outputs](#).

On RAYN Syrcadia for PC, if no broker is installed, selecting **Install Broker** will pull files from the specified address and start the installation process. Once installed, restart the Syrcadia application.

Preferences > Special



Lux mode

RAYN Syrcadia is designed for horticultural uses and displays lighting levels in μmol by default. Check this box to change to lux.

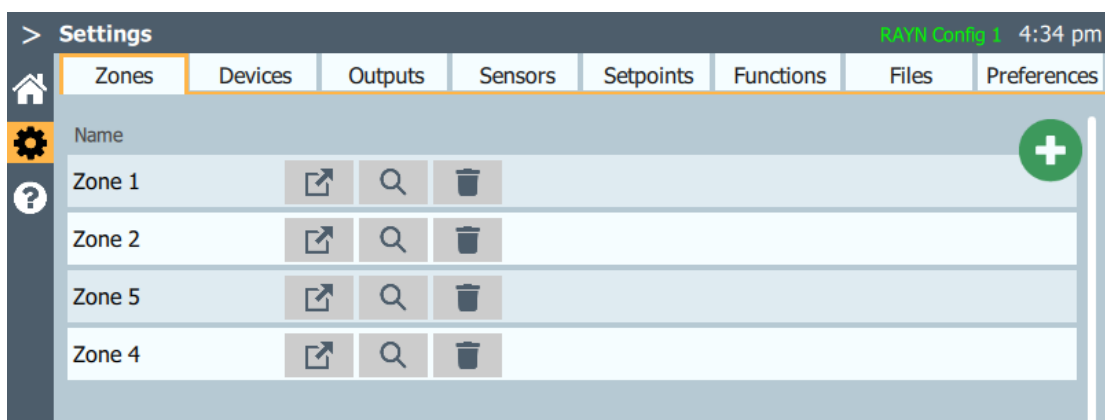
Allow External Control Option

Enables or disables control of the lighting system from an external source via sACN or Art-Net. Defaults to disabled.

Settings > Zones

RAYN Syrcadia systems are subdivided into one or more zones, each of which can control their own crop and day plans, DLI settings, and other controls. All fixtures and devices in your system must be assigned to a zone in order to be controlled.

The Zones tab lists all defined zones in RAYN Syrcadia. "Zone 1" is created by default in a new configuration.



Select the green plus button to add a new zone to the list.

To rename a zone, select its name, then use the keyboard to enter the new name. Adjust the text selection using the slider bars to edit a specific portion of the text. Select the green check mark button to confirm the change. Select the red X button or select the name again to cancel.

Select the configuration button to the right of the zone name to view the configuration tabs for that zone.

Select the magnifying glass icon on a zone item to view the devices assigned to that zone.

Select the trash can button to delete a zone and all of its data from the configuration.

Settings > Devices

RAYN Syrcadia is an advanced real-time controller software for multi-waveband lighting fixtures in addition to other devices such as dimmers and relays. It requires a connection to devices it is meant to control. This connection is made either via Ethernet-based protocols (sACN and Art-Net) to lighting fixtures or converters or by direct use of DMX512A signal. When using multi-waveband lighting fixtures, RAYN Syrcadia needs to know of and understand the wavebands available in those fixtures. RAYN Syrcadia offers a library of fixtures to choose from, or new fixtures can be requested by contacting your RAYN Growing Systems provider.

Devices controlled by RAYN Syrcadia require unique starting addresses. These may be set on the devices themselves, on an intermediate converter device (such as a DMX to 0-10 V converter) or may be assigned using RAYN Syrcadia through a protocol called Remote Device Management (RDM). Each device type may occupy a differing number of DMX control channels, depending on its wavebands and other parameters. RAYN Syrcadia has a capacity of 80 individually controllable devices and 5 universes of DMX512A with 512 addresses each per controller (one universe is supplied by a direct DMX connection to the controller, and/or all five may be distributed via Ethernet protocols). All the devices connected to RAYN Syrcadia must fit within this space.



Note: *If multiple devices of the same type share the same starting address, they may all be controlled as one device. If multiple devices of different types share the same starting address or if devices overlap addresses, it may appear that some devices are misbehaving, due to the mismatch in configurations of the devices.*

Devices are numbered in the control system and on the topographical display for selection during programming. Numbering is established by RAYN Syrcadia in the order in which devices are connected to the system. When connecting devices it is possible to alter the default numbers to create a more organized system.



Note: Device numbers must be unique across all zones on a controller.

RAYN Touch running RAYN Syrcadia software supports up to 80 individual device numbers. RAYN Syrcadia on PC supports up to 320.

Zone	Text	Dev.	Device type	Ind.	Universe	DMX
Zone 1		1	RAYN Rosa I R2a (17)	<input checked="" type="checkbox"/>	1 (1)	1-17
Zone 1	A/C Unit	2	Generic Dimmer 0-10V	<input checked="" type="checkbox"/>	1 (1)	18
Zone 2		3	RAYN Rosa I R2a	<input checked="" type="checkbox"/>	1 (1)	19-35
Zone 2		4	Generic Dimmer 0-10V	<input checked="" type="checkbox"/>	1 (1)	36
Zone 2		5	Generic Relay, no spectrum	<input checked="" type="checkbox"/>	1 (1)	37
Zone 1		11	Generic Relay, no spectrum	<input checked="" type="checkbox"/>	1 (1)	501

Device connections can be edited directly within this tab. Select one or more devices to select them. Use the cells along the top of the tab to assign the device to a zone or to adjust the device number, DMX universe and address. The device type cannot be changed here. To change a device type, use **Remove** to delete the device from the list, then use **Add Device** to add the correct type.

The **Text** column allows you to add labels or notes for each device. Devices may be marked independent by selecting the **Ind.** field, with gold indicating independent has been assigned. Independent devices are not recorded into spectra or overrides and will not be affected the **All On** or **All Off** overrides. Independent devices may be triggered by day plan commands.

When **Device detection (RDM)** is enabled in [Settings > Preferences > Basic](#), the **Find** and **Identify** buttons allow you to add and locate devices via RDM. When disabled, **Find** and **Identify** do not appear.

The **Link** button can be used to link a device discovered using RDM to a device that already exists within the configuration; for example, if the configuration was prepared offline, or a fixture head has been replaced with a new unit.



Note: *Devices require a certain number of DMX addresses to operate. When changing type, it is possible that the number of required addresses will change. If the new type requires more addresses than the older type, address conflicts may occur. These conflicts will be indicated in the list in red. Resolving these conflicts will require some devices to change their starting addresses until all devices have unique, non-overlapping addresses within a single universe.*

- **Devices > Add Device** - adds lights or relays to the controller.
- **Devices > Remove** - removes lights or relays and all of their programming from the controller.
- **Devices > Show Universes** - a display of the DMX output data channels for each DMX universe.
- **Devices > RDM** - toggles RDM communication, identification, and linking.

Devices > Add Device

Add Devices

Zone	Device	Count	Universe	DMX
	6	1	1	38

Manufacturer

Generic

RAYN

Model

Rosa 3 R3d

Rosa 3 R3e

Rosa 3 R3f

Rosa 3 R3g

Rosa I R2a

Rosa I R2a SUN+

Rosa II R1a

Rosa II R1a SUN+

✕

✓

Select a manufacturer and model from the scrolling lists

To connect a device to RAYN Syrcadia manually, follow these steps:

1. Select **Add Device**.
2. Choose the manufacturer and device type from the lists.
3. Choose a zone from the drop-down menu if you need to assign the device to a specific zone.
4. Select the device number if you need to change it.
5. Select the Count cell if multiple devices should be added consecutively at one time.
6. Select the Universe cell, if needed, to change the universe number. If the system is using DMX only, directly from the RAYN Touch controller, all addresses are on universe one. If a network is being used, enter the universe number that corresponds to the network gateway adapter port the device is connected to. The system will automatically assign the next available DMX address.
7. If necessary, change the address so it matches the address set on the device or change the address on the device to match the address setup in the controller.
8. Select the green check mark button to confirm - the device(s) should now appear in the list of devices in the Lighting tab. Select the red X button to cancel.



Note: Simple devices such as dimmers and relays are found in the "Generic" manufacturer list.



Note: RAYN Syrcadia supports a maximum of 80 devices addressed within the available DMX universes.



Note: To operate luminaires via other protocols, (such as DMX, or 0-10 V dimming), you must use the RAYN Touch network output and then connect the appropriate gateway type to the network.

Devices > Remove

Select a device in the list and select **Remove** to remove it from the configuration.



WARNING: Deleting devices after they have been saved into spectra will remove all their data from the configuration. There is no undo.

Devices > Show Universes

This button toggles an overlay of the universe view, in which one can see a graphical display of all the addresses within a selected universe.

Use the tabs at the top of this overlay to select one of the available universes. Move the horizontal bar up and down to suit your display layout by selecting and dragging the up and down arrows on the right hand side of the bar.



Note: If you contact Technical Services for help, they may ask you to check this screen.

The screenshot shows the RAYN Config 1 interface with the 'Settings' tab selected. The 'Devices' sub-tab is active, displaying a table of configured devices. Below the table, the 'Show Universes' overlay is visible, showing a grid of DMX universes (1-33) with their respective addresses and values.

Zone	Text	Dev.	Device type	Ind.	Universe	DMX
Zone 1		1	RAYN Rosa I R2a (17)	1 (1)	1-17	
Zone 1	A/C Unit	2	Generic Dimmer 0-10V	1 (1)	18	

Universes:											
1	2	3	4	5	6	7	8	9	10	11	12
255 Int	0 500	0 405	0 425	0 548	0 451	0 526	0 630	0 620	0 475	0 385	
12 850	13 740	14 665	15 665	16 5000	17 5000	18 128 Int	19 255 Int	20 500	21 405	22 425	
23 0	24 0	25 0	26 0	27 0	28 0	29 0	30 0	31 0	32 0	33 0	

At the bottom of the overlay, there are buttons: Add Device, Remove, Show Universes, Find, Identify, and Link.

Scroll up and down in the list to access all connected devices. Select a device in the list to highlight it in the universe view below. Scroll up and down in the universe display to view all the addresses in the selected universe.

Each cell in the universe view corresponds to a single address within the selected universe, indicated at the top of each cell. The center value in each cell is the actual DMX output as a value in the range of 0-255. A yellow bar to the right of the actual value indicates the approximate value being output. At the bottom of each cell, there is an indication of the device function controlled by that address. This may be Int for intensity control, or a waveband label, or other indication based on the functionality of the device.

Cells in the universe view colored in light blue indicate the base address of the item, which is the address entered in the Settings > Lighting tab DMX field. The cells in dark blue show the DMX addresses used by the device according to the number of controllable parameters it has.

Cells colored in red indicate an address overlap, where more than one dimmer, relay or device is assigned to the same DMX address. In some cases it may be desirable to allow overlaps but usually it should be avoided, especially when individual control of each device is desired.

Dark gray cells are unoccupied.

Devices > RDM

Remote Device Management (RDM) is a bi-directional protocol that shares a DMX512A connection between RAYN Syrcadia and an RDM-capable device.

When RDM is present in a device and enabled in RAYN Syrcadia, those devices will appear automatically in the lighting tab with all their current DMX settings. A blue DMX address indicates the device was discovered via RDM. Black indicates that the device was added manually to the config. Red indicates multiple devices with that same address.

Once found and displayed, and all addresses have been set or confirmed not to overlap, devices may be assigned to a zone. The device number may also be changed, if desired.



Note: *Device numbers must be unique.*

To enable or disable all RDM communications, select the **Device detection (RDM)** button in **Settings > Preferences > Basic**. RDM defaults to disabled.

Find and Identify

To determine which RDM-capable device in the lighting system corresponds to which address, ensure RDM is enabled, select the **Find** button, select the device in the list, then select the **Identify** button. This will place the device in the RDM identification mode, which may be to flash or to blink indicator LEDs. The identification state is determined by the device manufacturer. See the user documentation for the devices in the system to learn the identification states.

Link

Link allows you to use RDM to discover devices already in your system, and associate them with an existing patched device in your configuration. Once discovered and identified, the new, physical device will be linked to the zone and device number of another selected device using the DMX address of the discovered device. If needed, ensure that the DMX information on the new device matches that of the existing device before linking.

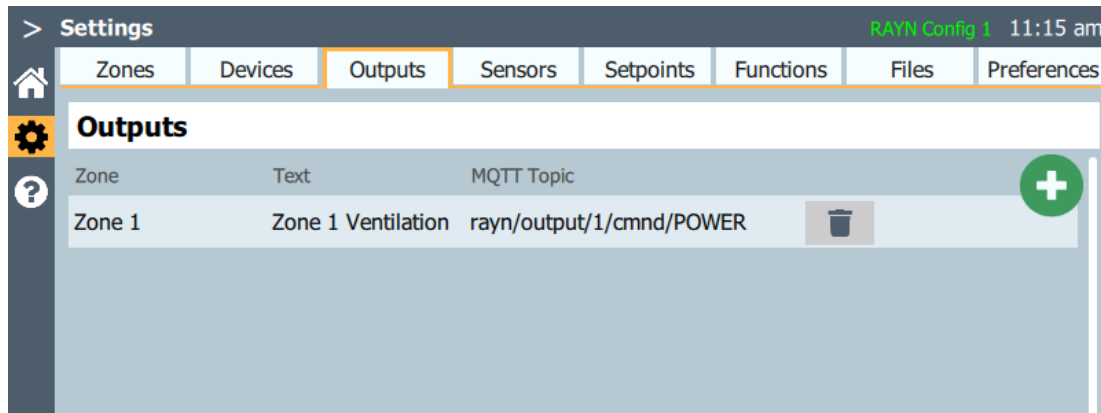
Settings > Outputs

Outputs allow RAYN Touch or Syrcadia on PC to communicate with MQTT devices in your system.

MQTT is an established machine-communication network protocol that delivers commands ("payloads") to specific addresses ("topics"). For more information, see mqtt.org.

Additional useful documentation may also be available online. Please consult the user manual of any device you want to control to identify the topic and payload structure.

Outputs can use any topic, and can be activated from a day plan (see [Zones > Day Plan](#)). In switched mode, the payload is on and off. In analog mode, the payload is a numerical value.



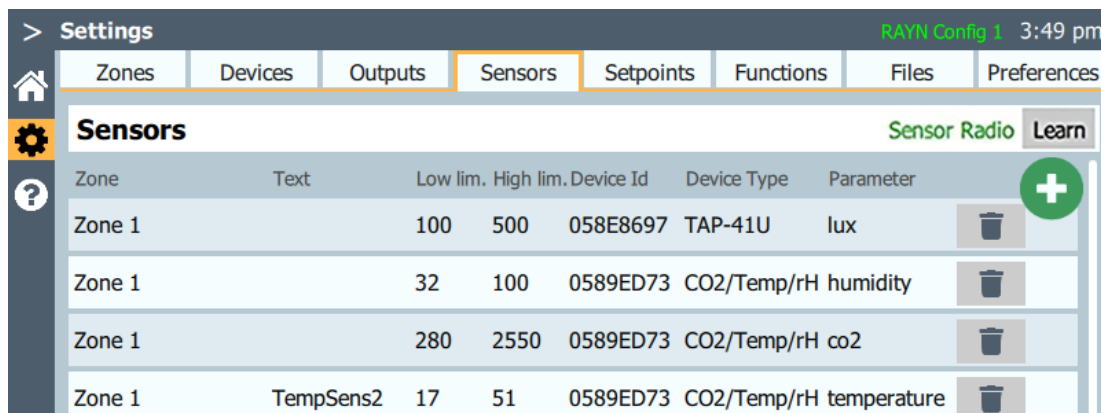
To add a new output, select the green + button in the upper right corner of the editor, choose the zone the MQTT device is assigned to, and optionally enter a text description of the output. Enter the appropriate topic string for your device.

To edit an existing output, select it and use the boxes at the top of the outputs window to make the desired changes. To delete an output, select the trash can icon on the step to be deleted.

Settings > Sensors

The Sensors tab is used to connect sensors to RAYN Syrcadia and assign them to zones.

Sensors that are compatible with RAYN Syrcadia can be acquired from your RAYN Growing Systems provider.



Add Existing Sensors

Select the **Learn** button in the upper right corner of the tab and then select the learn button on the sensor. The sensor will be displayed in the list once RAYN Syrcadia has connected to it. Online sensors will display in green, offline sensors in red.

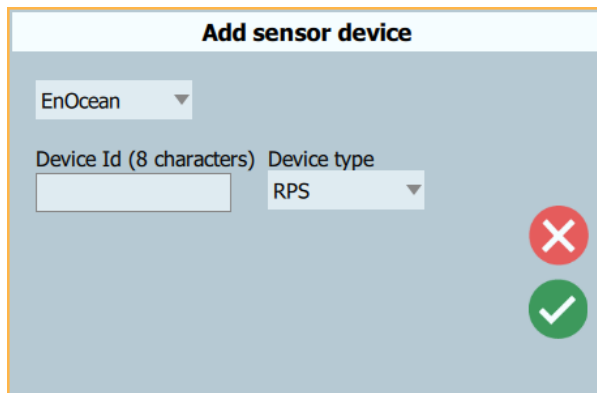
Select the sensor name and then its Zone field to assign the sensor to a specific zone.

Select the Low and High limit fields to enter new limits for the selected sensor. Type the new limit value then select the green check mark button to confirm. Select the red **X** button to cancel the edit.

To remove a sensor, select the trash can button to the right of the selected sensor.

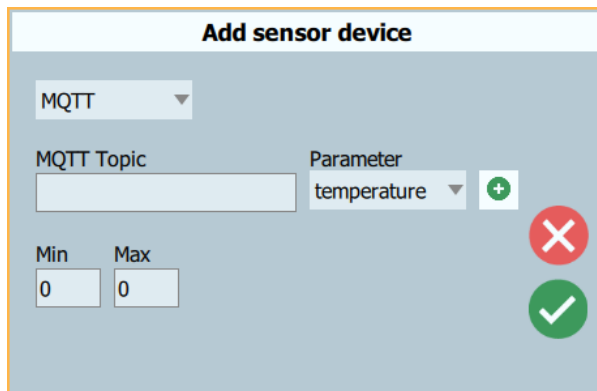
Add New Sensors

EnOcean and MQTT sensors can be added manually using the green plus button.



The screenshot shows the 'Add sensor device' form. At the top, there is a dropdown menu with 'EnOcean' selected. Below it, there are two input fields: 'Device Id (8 characters)' which is empty, and 'Device type' which has 'RPS' selected from a dropdown. On the right side of the form, there are two circular buttons: a red one with a white 'X' and a green one with a white checkmark.

EnOcean sensors are identified by an 8-character ID, typically located on one or more labels on the sensor. These IDs should be noted during installation. A device type should also be selected from the dropdown menu.



The screenshot shows the 'Add sensor device' form. At the top, there is a dropdown menu with 'MQTT' selected. Below it, there are two input fields: 'MQTT Topic' which is empty, and 'Parameter' which has 'temperature' selected from a dropdown. To the right of the 'Parameter' dropdown is a small green button with a white plus sign. Below these fields, there are two input fields: 'Min' with '0' and 'Max' with '0'. On the right side of the form, there are two circular buttons: a red one with a white 'X' and a green one with a white checkmark.

MQTT sensors are identified by a topic, a filter string that determines which sensor to talk to and which parameter to listen to. The payload of the sensor must be a simple numeric value. Min and max values for the parameter should also be entered in accordance with the sensor's documentation.

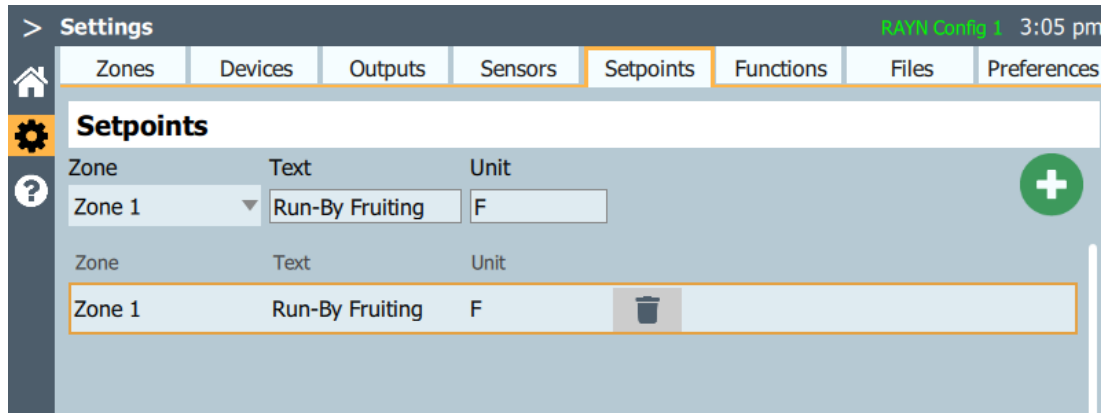
For more information on MQTT, see [Settings > Outputs](#).

Settings > Setpoints

Setpoints are triggers that allow specific functions to be activated by a day plan.

When activated in a day plan from [Zones > Day Plan](#), a setpoint sets a numerical target value for any measurable property in your space; temperature, for example. If the measured property goes a specified amount above or below the setpoint value, a function from [Settings > Functions](#) can activate or deactivate other devices in your system.

Adding and Editing Setpoints



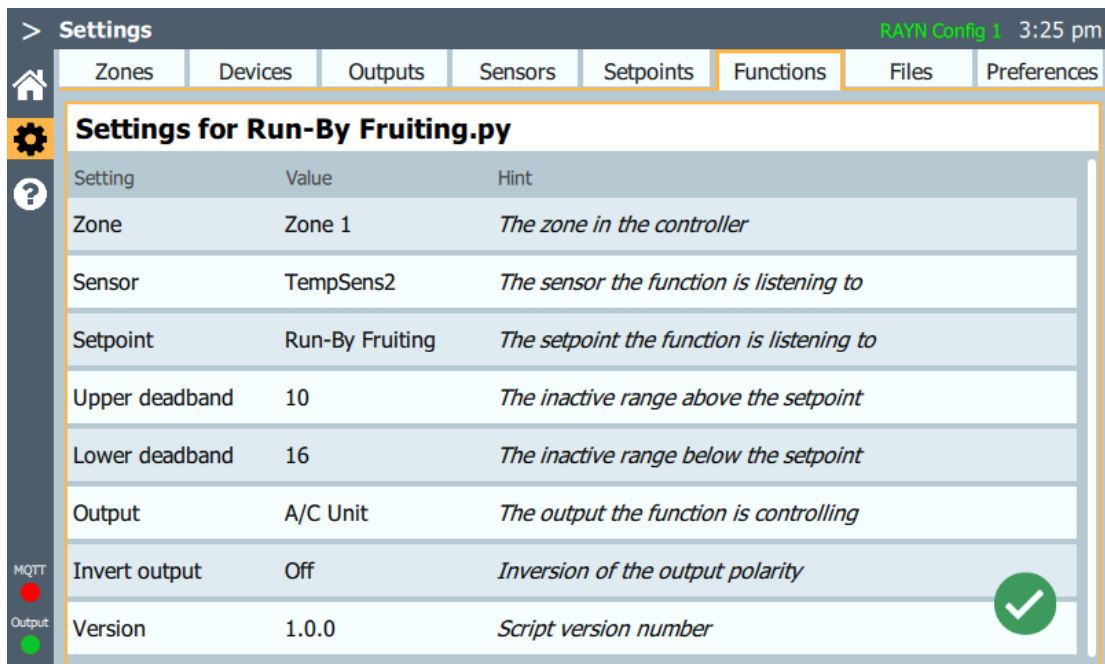
To add a new setpoint, select the green + button in the upper right corner of the editor, and choose a zone the setpoint will apply to.

You may also enter a text description and unit for the setpoint; these fields are for organization only and have no effect on the setpoint's associated function or day plan. In the example above, you can see a setpoint created for Zone 1, using Fahrenheit (F) as the unit.

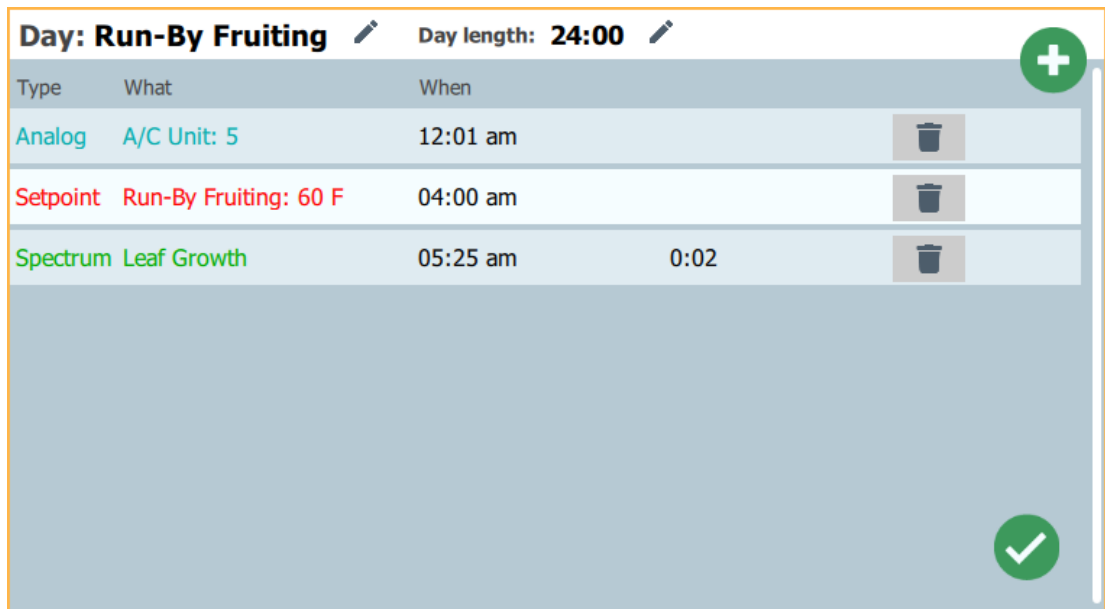
To edit a setpoint, select it and use the fields at the top of the setpoint window to make the desired changes. Select a setpoint's trash can icon to delete it.

Using Setpoints

Once a setpoint is added, it can be associated with a function and a day plan.



Above is a function that has been associated with the existing setpoint. The function is monitoring temperature via a sensor, and is controlling an air conditioning unit.



Above you can see a day plan created to set the setpoint to a value of 60 at 04:00 am. The unit from the **Setpoints** tab is also displayed.

Since the upper deadband is set to 10 in our example, the function will activate the A/C unit if the temperature sensor detects a temperature higher than 70° F. Since the lower deadband is 16, the function will deactivate the A/C unit once a temperature lower than 44°F is measured.

Settings > Functions

Functions are Python scripts that can automatically monitor and control properties and devices in your space.

RAYN Syrcadia on PC users will be notified Python is required for functions to work if not already installed.

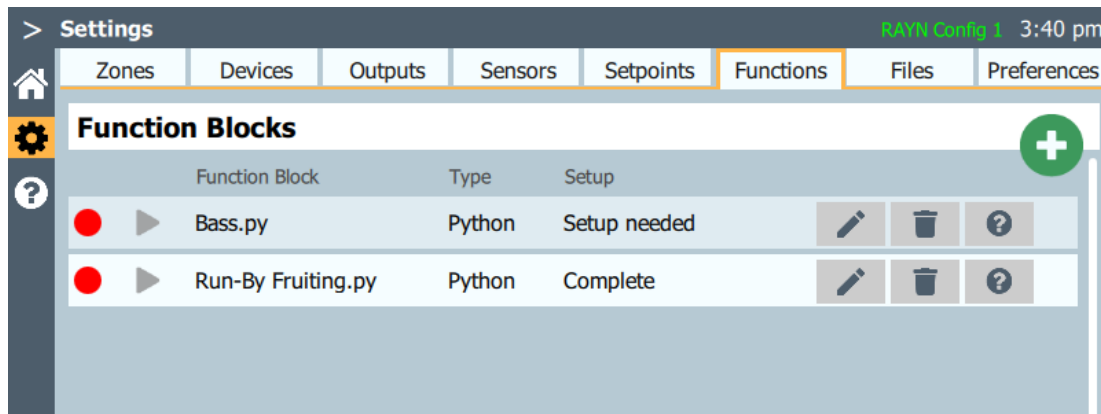
1. Select the **Install** button in the top right.
2. Choose the **Customize installation** option.
3. Leave all Optional Features selected and continue with the **Next** button.
4. Under Advanced Options, select "Add Python to environment variables."
5. Use the **Install** button to proceed with installation.
6. Once complete, restart the Syrcadia software for the changes to take effect.

Using Functions

Functions are configured to monitor a property via a connected sensor from [Settings > Sensors](#), as well as setpoints activated from a day plan (see [Settings > Setpoints](#)). When the value for this property goes above or below preset limits, the function can automatically activate or deactivate other devices from [Settings > Devices](#). For example, in a space with a temperature sensor where the temperature has risen too high, a function could activate an air conditioner until the sensor detects that the temperature is within an acceptable range again.

Functions require a setpoint in [Settings > Setpoints](#) and a day plan that sets the setpoint value in [Zones > Day Plan](#).

Adding and Editing Functions



To add a new function, select the green + button in the upper right corner of the editor. Two default functions are included, along with a template for creating functions of your own.

> Settings RAYN Config 1 11:53 am

[Zones](#)
[Devices](#)
[Outputs](#)
[Sensors](#)
[Setpoints](#)
[Functions](#)
[Files](#)
[Preferences](#)

Settings for Base.py

Setting	Value	Hint
Zone		The zone in the controller
Setpoint		The setpoint the function is listening to
Sensor		The name of the sensor we are listening to
Upper deadband	0	The inactive range above the setpoint
Lower deadband	0	The inactive range above the setpoint
Invert output	Off	Invert the output polarity
Output		The output the function is controlling
Version	1.0.0	Script version number

MQTT ●
Output ●

Once a function is added, it will indicate additional setup is needed. Select a function's pencil icon to edit the settings for the script.

> Settings RAYN Config 1 3:25 pm

[Zones](#)
[Devices](#)
[Outputs](#)
[Sensors](#)
[Setpoints](#)
[Functions](#)
[Files](#)
[Preferences](#)

Settings for Run-By Fruiting.py

Setting	Value	Hint
Zone	Zone 1	The zone in the controller
Sensor	TempSens2	The sensor the function is listening to
Setpoint	Run-By Fruiting	The setpoint the function is listening to
Upper deadband	10	The inactive range above the setpoint
Lower deadband	16	The inactive range below the setpoint
Output	A/C Unit	The output the function is controlling
Invert output	Off	Inversion of the output polarity
Version	1.0.0	Script version number

MQTT ●
Output ●

2-Point Regulator

The 2-point regulator function will automatically activate or deactivate a single device when a measured property goes a specified amount above or below the setpoint value.

The following script settings are available:

- **Zone** - the RAYN zone the function will affect. A zone must be selected in order to enter additional settings.
- **Sensor** - the sensor being used to measure a property; temperature, for example.

- **Setpoint** - the desired level of the property being monitored. This is set when a setpoint is activated in a day plan.
- **Upper deadband** - the amount the measured property can rise above the setpoint before the output device is set to its maximum level. For example, with a setpoint of 20° and a desired limit of 30°, the upper deadband would be 10.
- **Lower deadband** - the amount the measured property can fall below the setpoint before the output device is set to its minimum level. For example, with a setpoint of 20° and a desired limit of 4°, the lower deadband would be 16.
- **Output** - the device that will be set to its minimum or maximum level when the function activates. Behavior is determined by device type; fixtures go to full or zero, relays turn on or off, and so on.
- **Invert output** - reverses the polarity of the signal being sent to the output, allowing you to turn a device off instead of on, or a fixture to full instead of zero.
- **Version** - the version number of the script.

3-Point Regulator

The 3-point regulator function will automatically activate or deactivate two separate devices, one triggered by an upper limit and the other by a lower limit.

The following script settings are available:

- **Zone** - the RAYN zone the function will affect. A zone must be selected in order to enter additional settings.
- **Sensor** - the sensor being used to measure a property; temperature, for example.
- **Setpoint** - the desired level of the property being monitored. This is set when a setpoint is activated in a day plan.
- **Default Setpoint** - the setpoint value used until a different value is set via a day plan.
- **Upper deadband** - the amount the measured property can rise above the setpoint before the **Higher Than Output** is activated or deactivated. For example, with a setpoint of 20° and a desired limit of 30°, the upper deadband would be 10.
- **Higher Than Output** - the device that will be activated or deactivated once the measured property is higher than the setpoint value plus the upper deadband value.
- **Lower deadband** - the amount the measured property can fall below the setpoint before the **Lower Than Output** is activated or deactivated. For example, with a setpoint of 20° and a desired limit of 4°, the lower deadband would be 16.
- **Lower Than Output** - the device that will be activated or deactivated once the measured property is lower than the setpoint value minus the lower deadband value.
- **Version** - the version number of the script.

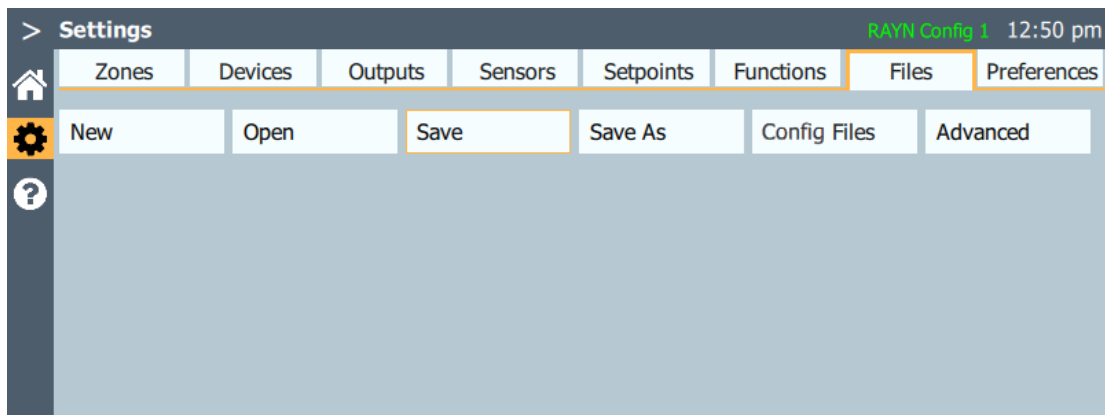
Base Template and Custom Functions

The included base template file is modeled after the 2-point regulator script, and can be edited to create a custom function. Custom functions can also be edited on a Windows® or macOS® compatible computer using any Python-compatible script-editing software.



WARNING: RAYN SYRCADIA V2.2.0 SOFTWARE CONTAINS SCRIPTING LANGUAGE THAT COULD ALLOW END-USERS TO PROGRAM CUSTOMIZED LANGUAGE TO INTERACT WITH AND/OR CONTROL THIRD PARTY PRODUCTS AND DEVICES. YOU, AS THE END-USER, ASSUME ALL RISKS ASSOCIATED WITH, RELATED TO, OR ARISING OUT OF YOUR USE OF OR ACCESS TO SUCH FEATURES. YOU AGREE TO INDEMNIFY AND HOLD HARMLESS ELECTRONIC THEATRE CONTROLS, INC. ("ETC"), ELECTRONIC THEATRE CONTROLS, INC. D/B/A RAYN GROWING SYSTEMS ("RAYN"), THEIR RESPECTIVE OFFICERS, DIRECTORS, EMPLOYEES AND AGENTS FROM AND AGAINST ANY AND ALL CLAIMS, LIABILITIES, DAMAGES, LOSSES OR EXPENSES, INCLUDING ATTORNEYS' FEES AND COSTS, RELATING TO OR ARISING OUT OF YOUR USE OF OR ACCESS TO SUCH SCRIPTING LANGUAGE FEATURE IN THE SYRCADIA SOFTWARE.

Settings > Files



Configuration files (growing programs) may be saved and loaded here. The Files tab also provides for loading updated system files and exporting the sensor logs to a USB memory stick.

- [Files > New](#)
- [Files > Open](#)
- [Files > Save](#)
- [Files > Save As](#)
- [Files > Config Files](#)
- [Files > Advanced](#)



CAUTION: *All data is stored internally on the RAYN Touch controller in non-volatile memory. Do not switch off the power until any pending [Files > Save](#) operation is completed, or you may lose data. It is strongly advised that you make periodic backups of important data to an external memory stick using the Export function.*

Files > New

Config files contain all the data for a growing program including the connected devices, lighting states including spectra and relays and the growing plan timing. The config does not contain hardware settings such as Network, RAYN Syrcadia Remote PIN codes, and Date and Time, which persist between files.



Note: Use the [Files > Save](#) or [Files > Save As](#) functions to save the current programming to the RAYN Touch controller. Once saved, use the [Files > Advanced > Export](#) functions to save a backup copy of the existing programming to a USB memory stick before creating a new configuration.

Start a new config file by going to **Settings > Files > New**.



Note: You will be warned that this action will clear the memory. Select the green check mark "OK" button to clear memory and start a new show, or the red X button to cancel.

It is highly recommended to save the new configuration to a named file at this time (see [Files > Save As](#)).

Files > Open

Open an existing configuration file by going to **Settings > Files > Open**.



Note: RAYN Syrcadia on PC will use the standard Windows File Explorer for Open, Save and Save As operations.

Select the configuration file name in the Open File list, then select the green check mark button to confirm. Select the red X button to cancel.



CAUTION: All data is stored internally on the RAYN Touch Controller in non-volatile memory. Do not switch off the power until any pending Save operation is completed, or data may be lost. It is strongly advised to export important data to a USB stick periodically using the [Files > Advanced > Export](#) functions.

Files > Save

Save the configuration file to the controller by going to **Settings > Files > Save**.

The configuration is saved directly back to its current name, indicated in the lower left corner of the tab. If the configuration has not been given a name already, enter one now. Select the green check mark button to confirm. Select the red X button to cancel.



Note: RAYN Syrcadia on PC will use the standard Windows File Explorer for Open, Save and Save As operations.



CAUTION: All data is stored internally on the RAYN Touch Controller in non-volatile memory. Do not switch off the power until any pending Save operation is completed, or data may be lost. It is strongly advised to export important data to a USB stick periodically using the [Files > Advanced > Export](#) functions.

Files > Save As

Save the configuration file to the controller with a new name by going to **Settings > Files > Save As**.

Enter a name for the configuration. Select the green check mark button to confirm or the red X button to cancel.



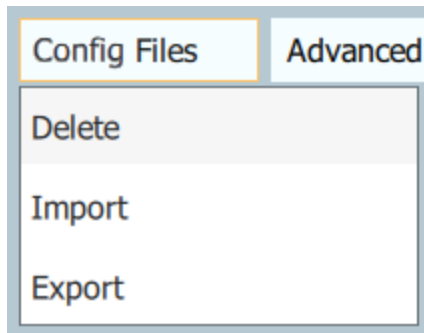
Note: RAYN Syrcadia on PC will use the standard Windows File Explorer for Open, Save and Save As operations.



CAUTION: All data is stored internally on the RAYN Touch Controller in non-volatile memory. Do not switch off the power until any pending Save operation is completed, or data may be lost. It is strongly advised to export important data to a USB stick periodically using the [Files > Advanced > Export](#) functions.

Files > Config Files

The Config Files menu includes commands for moving files to and from a USB memory stick, or to delete a file resident in the unit.



Note: This menu does not appear in RAYN Syrcadia on PC as these functions can be performed within the File Explorer window.

Import



Note: Config files must be saved on the memory stick in a folder named "RAYN Configurations" in the root directory to be found by RAYN Touch.

Connect a USB memory stick to the controller. Press **Config Files > Import**. Press the file name from the list. Press the green check mark button to confirm. Press the red X button to cancel.

Export



Note: Config files will be saved on the memory stick in a folder named "RAYN Configurations" in the root directory.

Connect a USB memory stick to the controller. Press **Config Files > Export**. Press the green check mark button to confirm. Press the red X button to cancel.

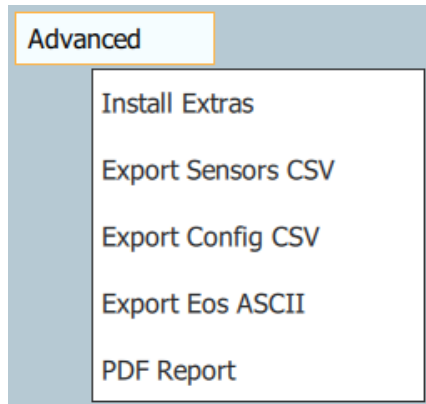


CAUTION: All data is stored internally on the RAYN Touch controller in non-volatile memory. Do not switch off the power until any pending Save operation is completed, or data may be lost. It is strongly advised to export important data to a USB stick periodically using the [Config Files > Export](#) function.

Delete

Press **Delete** to delete a configuration file from the controller. Press the name of the file to select it for deletion. Press the green check mark button to confirm. Press the red **X** button to cancel.

Files > Advanced



Install Extras

Add or replace data files, such as new device personalities or help texts.



Note: *Extras files must be saved on the memory stick in the root directory.*

Connect a USB memory stick to the controller. Select **Config Files > Advanced > Install Extras**. Select the file to be installed in the list. Select the green check mark button to confirm. Select the red **X** button to cancel.

Export Sensors CSV

Export the sensor data for each configured zone onto a USB memory stick. These files contain snapshots of the sensor feedback made at regular 5-minute intervals in a file format that can be used in other applications for record keeping and sensor analysis.



Note: *Sensor log files will be saved on the memory stick in a folder named "RAYN Sensor Logs" in the root directory.*

Connect a USB memory stick to the controller. Select **Config Files > Advanced > Export Sensor Logs**. Select the green check mark button to confirm or the red **X** button to cancel.

Export Config CSV & Eos ASCII

Export the configuration data for each configured zone to CSV or ASCII files on a USB memory stick. These files contain the device settings, spectrum data for each device, and day and crop plan settings in a file format that can be used in other applications for record keeping.

Eos ASCII files can be imported into the show file of any ETC Eos family lighting console.



Note: *CSV and ASCII files will be saved on the memory stick in a folder named "RAYN Exports" in the root directory.*

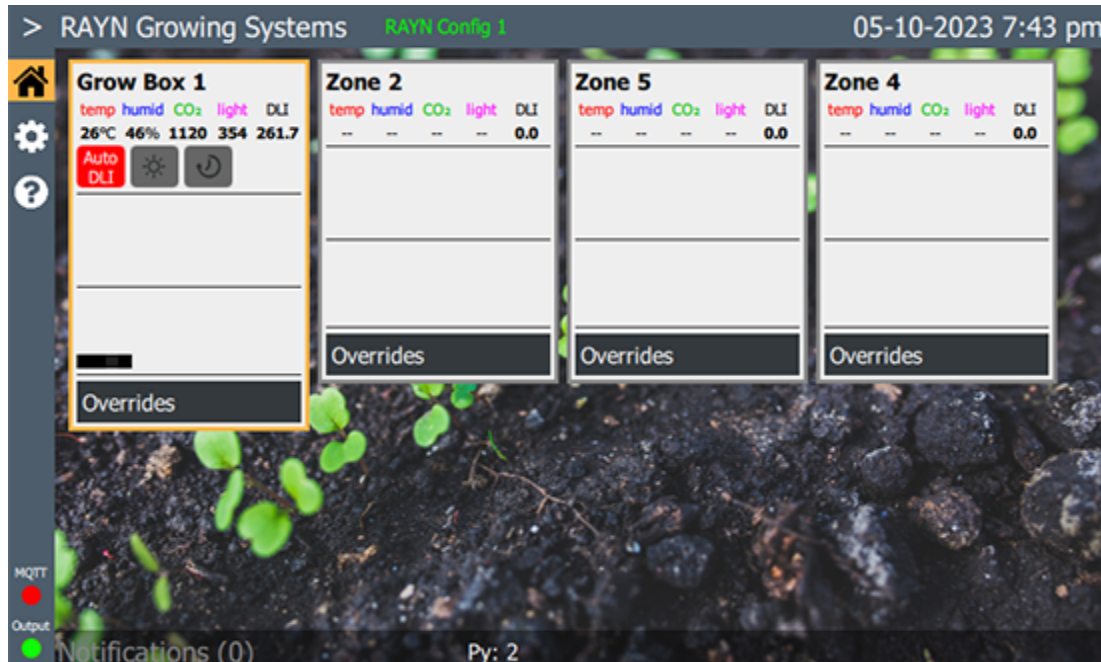
Connect a USB memory stick to the controller. Select **Config Files > Advanced > Export Config CSV** or **Export Eos ASCII**. Select the green check mark button to confirm or the red **X** button to cancel.

PDF Report

Exports a topographical view of every zone that includes a device list.

RAYN Syrcadia Dashboard

The Dashboard shows an overview of zones configured in RAYN Syrcadia. It shows the status of each zone including sensor feedback, the current state in the Scheduler such as which crop or day plan is running and which spectrum is currently active.



Also included are controls for Auto DLI and External Control functions and overrides, if defined.



Note: RAYN Syrcadia on PC can be run in a basic or unlocked mode. In basic mode, there is only one zone allowed and the application always opens into the Manual tab of that zone. Basic mode also has a limited feature set within that zone.

Dashboard > Notifications

Notifications for all zones will be displayed when something in the system triggers an alert, such as a sensor reading that falls outside the set min/max range for a parameter. Select the Notifications bar at the bottom of the window to expand the Notifications center. Each notification includes a date and time stamp, the zone name, the parameter name and the state that triggered the notification.

Notifications may be cleared by selecting the trash can icon at the right of the message. Select the Dashboard button again to exit the notification center.



Note: RAYN Syrcadia on PC will also indicate its ability to output control signals to the lighting system using a red or green dot next to the Notifications bar in the Dashboard. Red indicates the system is offline. Green indicates the system is able to send control signal to the lighting system.

Dashboard > Zones

RAYN Syrcadia systems are subdivided into one or more zones, each of which can control their own crop and day plans, DLI settings, and other controls. All fixtures and devices in your system must be assigned to a zone in order to be controlled.

This area displays the summary status display for each defined zone controlled by RAYN Syrcadia. Each zone tile includes the zone name, current sensor feedback for temperature, humidity, and CO₂. If enabled, the External Control toggle button is also found here (see [Settings > Preferences > Special](#)).



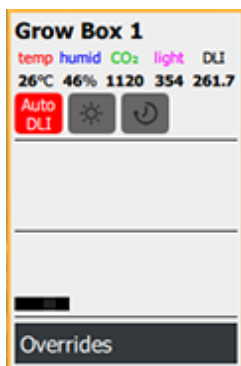
Note: *RAYN Syrcadia on PC can be run in a basic or unlocked mode. In basic mode, there is only one zone allowed and the application always opens into the Manual tab of that zone. Basic mode also has a limited feature set within that zone.*

The daily light integral (DLI) of an area measures the amount of photosynthetically-active light it receives over a 24-hour period of time.

Zone tiles display the current DLI value and controls for the Auto DLI feature.



Note: *Auto DLI controls are available when there is a light sensor connected to a zone.*



Select the zone tile to open the configuration tabs for that zone. Opening a zone from the dashboard will also open the zone in the Manual tab (see [Zones > Manual](#)).

In the middle section of the tile, the system will display information about the current crop and day plans. Beneath that, information about the state of the system is displayed, including if the spectrum has been manually set, is the result of a planned event or an override. Status for individual devices in the spectrum is also displayed here in the preview icons at the bottom of the display region.

If the system has been interrupted by a manual or override state, the area above the layout mimic will change color and a play button will appear next to the crop/day plan information. A notification that the Scheduler has been interrupted is also shown in the title bar of the screen. Select the play button to return the system to the automated plan.

Zone Control and Indicators

Zone control buttons include:

- **Auto DLI** - select this button to turn on the Auto DLI controls (when enabled, the button turns red). Auto DLI can be managed by the system by adjusting the overall intensity of the spectrum, or by extending the photoperiod, or both.



Note: *Auto DLI controls are available when there is a light sensor connected to a zone.*

Auto DLI cannot extend the photoperiod beyond midnight. Take care when using auto DLI with time period extension if growing short-day plants which are sensitive to the day length.

Auto DLI brightness control provides the most adjustability when spectra are recorded with less-than-100% intensity.

- **Lightbulb button** - appears when Auto DLI is enabled. Select this to have RAYN Touch maintain the DLI using overall intensity of the lighting (when enabled, the button turns pink).
- **Clock button** - appears when Auto DLI is enabled. Select this to have RAYN Syrcadia maintain the DLI using an adjustment of the length of the photoperiod (when enabled, the button turns pink).
- **Play button** - appears when the spectrum is manually created or the result of activating an override state. Select this button to return to the day plan.
- **Resume all** - appears when one or more spectra are in a manual or override state. Select this button to return all zones to their day plans.
- **Overrides** - accesses override states for the system. The override indicators above the button are color-coded based on the data the zone is outputting.
- **External Control** - appears when the External Control option is enabled in **Settings > Preferences > Special**. Select this button to suppress control of this zone from RAYN Syrcadia so that an external controller may have control of those devices.

Zone indicators include:

- **Radio** - whether an EnOcean dongle is connected to the RAYN system. A compatible radio device must have been added to the configuration in order for this indicator to appear.
- **Overrides** - these indicators above the Overrides button are color-coded based on the data the zone is outputting.

The following indicators are always visible in the bottom left of the toolbar:

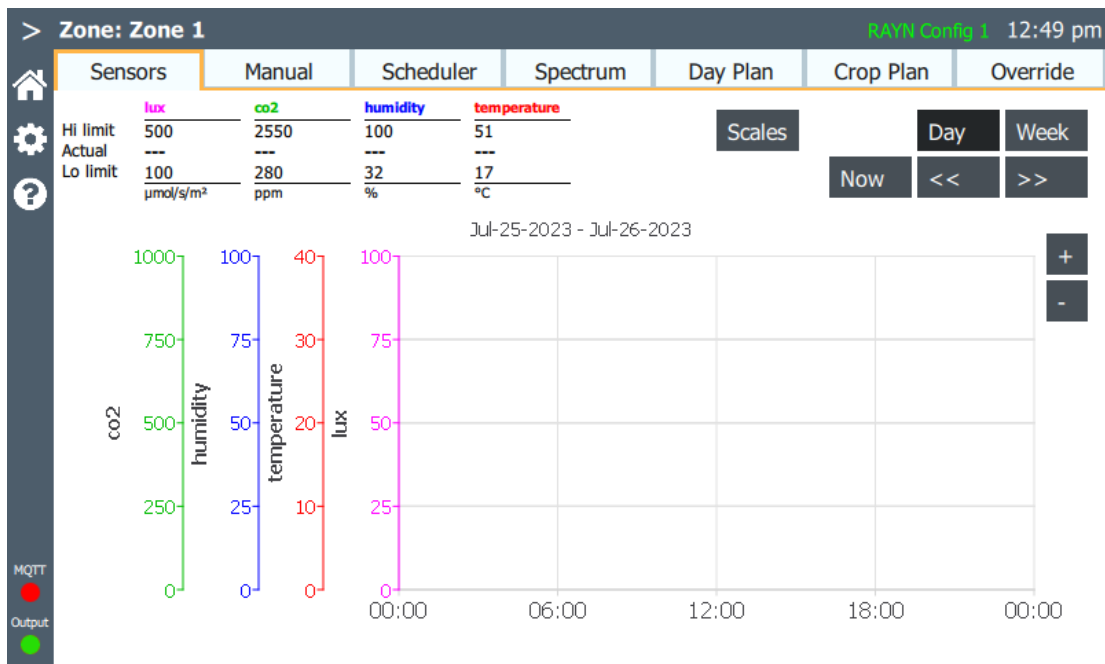
- **MQTT** - whether or not there is an active MQTT broker (see **Settings > Preferences > Network**).
- **Output** - whether or not RAYN Syrcadia on PC is detecting an output dongle.

Zones > Sensors

The Sensors tab shows the current state of sensor feedback of the selected zone. The connected sensor parameters are shown across the top including the most recent reported sensor value and the min/max values set for those parameters.



Note: *Sensors are not available in RAYN Syrcadia on PC in basic mode.*



A history chart of sensor reports is displayed below that on a timeline (see [Zones > Sensors Chart](#)).

Sensor data is recorded continuously to an internal log file. RAYN Touch users can export this file to a USB memory stick. Syrcadia on PC users can save directly to their computer.

Zones > Sensors Chart

The history chart on the Sensors tab tracks sensor reports on a timeline. Controls in the upper-right toggle the display of the scales and report locations (dots). Data can be viewed at zoom levels that correspond to a week or day, or at a zoom level of the user's choice using the plus/minus buttons. The graph can be snapped to the current time (now) or be moved left or right to view historical data.

Sensor data is recorded continuously to an internal log file that can be exported to a USB memory stick.

Status chart control buttons include:

- **Scales** - toggles the display of the parameter scales on the left side of the chart.
- **Dots** - toggles the display of the reporting dots on the chart.
- **Now** - centers the chart at the current time.
- **Day** - sets the zoom level to show a complete day's data.
- **Week** - sets the zoom level to show a complete week's data.
- **<< / >>** - moves the graph left and right to view historical data.
- **+/-** - adjusts the zoom level of the chart.

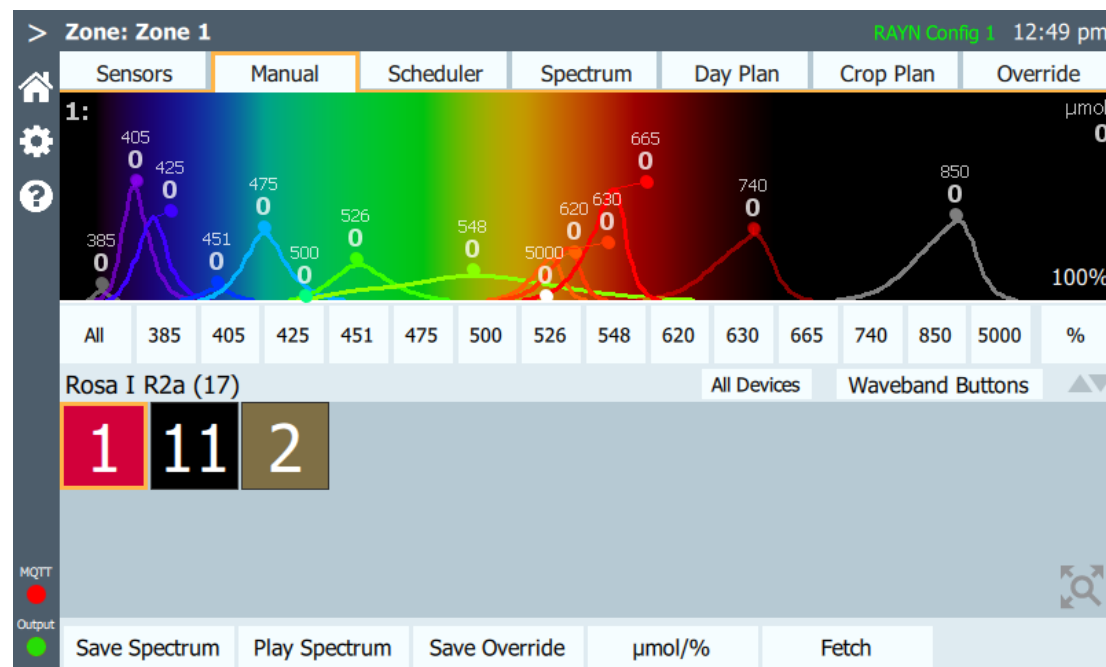


Note: RAYN Syrcadia supports multiple photo sensors (RPS) in a single zone by averaging their reported data. RAYN Syrcadia supports a single multi sensor (RMS) per zone. Sensors are not supported in RAYN Syrcadia on PC in basic mode.

Zones > Manual

This tab shows a diagram of the spectrum of the selected device and a grid containing device buttons for the zone (see [Settings > Devices](#)). The screen is in two parts, upper and lower, separated by a horizontal bar containing the selected device's name and some controls described below. Move the horizontal bar up and down to suit your display layout by selecting and dragging the up and down arrows on the right hand side of the bar.

The spectrum will display the controllable wavebands of the selected device (or multiple devices when all selected devices are of the same type). The spectrum can be adjusted in various ways (see **Set Values** below). Values default to percentage values, but if calibrated lights are being used, μmol values may be displayed instead (see [Manual > \$\mu\text{mol}/\%\$](#)). If more space is needed on the screen, select the **Waveband Buttons** to toggle them on or off.



The device grid may be zoomed and moved by using two fingers to pinch or pan. When devices are magnified, they show their name, a color simulation and spectrum content; when their size is reduced, the spectrum and name will disappear.



Note: The spectrum shown in a device box in the lower section is not a spectral graph but a set of bars showing the relative control levels for each waveband.

Relay devices are shown in black (off) or white (on).

If the global layout has been enabled for your system, arrangement of devices must be done in **Settings > Layout**.

Configure Device Grid

As devices are connected to RAYN Syrcadia (see [Settings > Devices](#)) they are placed as buttons onto a grid displayed in the **Manual** and **Scheduler** tabs. These buttons are used to select and deselect devices in the zone, and to mimic each device's output. The grid will also determine the arrangement of the status icons for each device in the zone status tile on the home screen.

Devices can be arranged within the grid to suit the needs of the zone. This may be to more closely match the configuration of the zone, or to simplify selection or display of devices of different types.

To move a device within the grid, select and hold the desired device button until the grid appears, then drag the device button to a new position. When released, the grid will disappear and arrange mode will close.

Select Devices

Select a device in the lower section. Selected devices are shown surrounded by a yellow box. Select a device again to deselect it. Select additional devices to add them to the selection. Select **All Devices** to select all devices controllable by RAYN Syrcadia. Double-tap a device to deselect all other devices.

Select devices one at a time or in groups to set values using the spectrum controls.



Note: *The spectrum will display the controllable wavebands of multiple devices when all selected devices are of the same type. Dissimilar type selections will only allow intensity control.*

Set Values

The wavebands can be controlled in several ways:

- Select a waveband button and then swipe up or down in the spectrum above the button to adjust the level.
- To select multiple wavebands, press **All**, then deselect the unwanted wavebands. The remaining selected wavebands can be controlled together by swiping in the spectrum above the buttons. Individual control is available by swiping from the waveband button. Performing an individual adjustment removes that waveband from the group selection.
- Select and hold a waveband button and swipe up or down to adjust the level.
- Double-select a waveband button to open the keypad to enter a specific percentage value.

Adjust the overall intensity of the selected device(s) by selecting and swiping the % button at the right end of the waveband buttons.

Once the system is configured, these settings can be stored to a recorded Spectrum that can be used in day plans or to a recorded Override state that can be triggered manually.

- To record a Spectrum, see [Manual > Save Spectrum](#).
- To record an Override, see [Manual > Save Override](#).
- To activate a previously recorded Spectrum, see [Manual > Play Spectrum](#).

Manual > Play Spectrum

Spectra include spectral values and intensities for adjustable luminaires, intensity values for simple dimmable luminaires and the on or off state of any relays connected to RAYN Syrcadia (see [Settings > Devices](#)).

To activate a recorded Spectrum from the Manual tab (and replace the current output for a zone), press **Play Spectrum** and select the spectrum from the list.

To turn the day timer on and off, see [Scheduler > Real Time & Automatic](#).



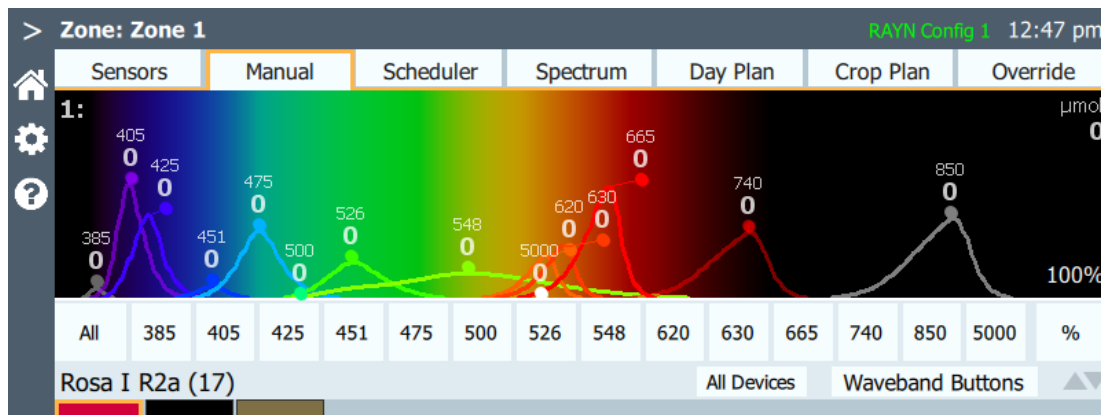
Note: *Auto DLI may intervene in a manually set state if the target DLI has been achieved while the manual state is active. In this case, the Off state will be recalled.*

To turn Auto DLI on and off, see [Dashboard > Zones](#).

For accurate available DLI calculation, before recording a spectrum ensure that the light level value from the sensor has been received corresponding to the levels just set, and are not persisting from a previous light level reading.

Manual > Waveband Buttons

The waveband buttons appear when a device with spectral control is selected. Each button is labeled with a controllable waveband for the selected device(s) and can be used to set or adjust levels for that waveband.



The wavebands can be controlled in several ways:

- Select a waveband button or the **All** button to select a/all waveband(s) and then swipe up or down in the spectrum above the button to adjust the level(s).
- Select and hold a waveband button or the **All** button and swipe up or down to adjust the level.
- Double-select a waveband button to open the keypad to enter a specific percentage value.



Note: *Adjustments using the All button are absolute, not relative, and once levels are raised to full or taken to zero all the wavebands will follow at the same level and previous level differences between wavebands are lost.*

The **Waveband Buttons** button toggles the individual waveband buttons beneath the spectrum display on and off. Use this option to hide the waveband buttons if more screen space is needed.

All

The **All** button is a shortcut to select all the available wavebands for selected devices. It allows adjustment of all wavebands at one time.

- Select the **All** button to select all wavebands and then swipe up or down in the spectrum above the button to adjust the values.
- Select and hold the **All** button and swipe up or down to adjust the values.

Adjustments are absolute, not relative, and once levels are raised to full or taken to zero all the wavebands will follow at the same level and previous level differences between wavebands are lost.

Manual > All Devices

The **All Devices** button selects all the devices connected to the zone (see [Settings > Devices](#)). If all devices are the same type and can produce a spectrum, the spectrum display will allow the control of wavebands. If a mixed type selection is made, or if the devices are dimmers, relays, or otherwise unable to produce a spectrum, a single intensity line or intensity percentage will be displayed.

Select **All Devices** to select all devices connected to the zone.

Manual > %

Select % and wipe up and down to adjust overall intensity levels. The intensity level is indicated above the button.

Double-select the % button to display the keypad for numeric entry.



Note: *Intensity is assumed to be 100% when multi-waveband devices are first selected upon newly starting the system.*

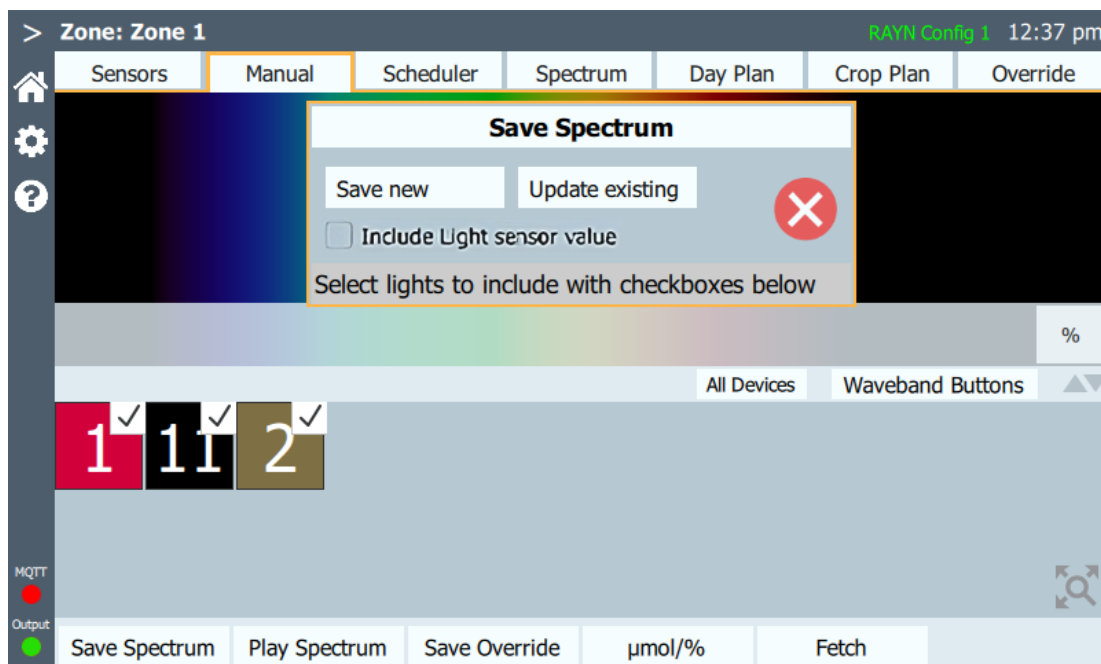
Manual > Save Spectrum

Spectra include spectral values and intensities for adjustable luminaires, intensity values for simple single-channel dimmable luminaires and the on or off state of any relays connected to RAYN Syrcadia (see [Settings > Devices](#)). Once configured, a lighting state may be saved for future use. Spectra may be used either manually or as part of a timed day plan.

To save a new spectrum, select **Save Spectrum**. Ensure that the fixtures that should be recorded all show a check mark in the device grid - adjust as necessary. Select **Save New** and enter a name. Each spectrum must have a unique name.



Note: *Entering the same name as an existing spectrum will ask for confirmation before recording.*



To save over an existing spectrum, select **Save Spectrum**. Ensure that the fixtures that should be recorded all show a check mark in the device grid - adjust as necessary. Select **Update Existing**, then select the spectrum name in the list. Press **OK** to confirm overwriting the previously recorded spectrum.



Note: For accurate available DLI calculation, before recording a spectrum ensure that the light level value from the sensor has been received corresponding to the levels just set, and are not persisting from a previous light level reading. If you check the **Include Light sensor value** box when recording, the recording will complete automatically after a new update from the sensor is received. If the box is left unchecked and recording proceeds without waiting, the DLI value stored with that spectrum may be wrong.

If the spectrum can be added to an existing plan in the Scheduler, an **Add To Scheduler** checkbox will appear.

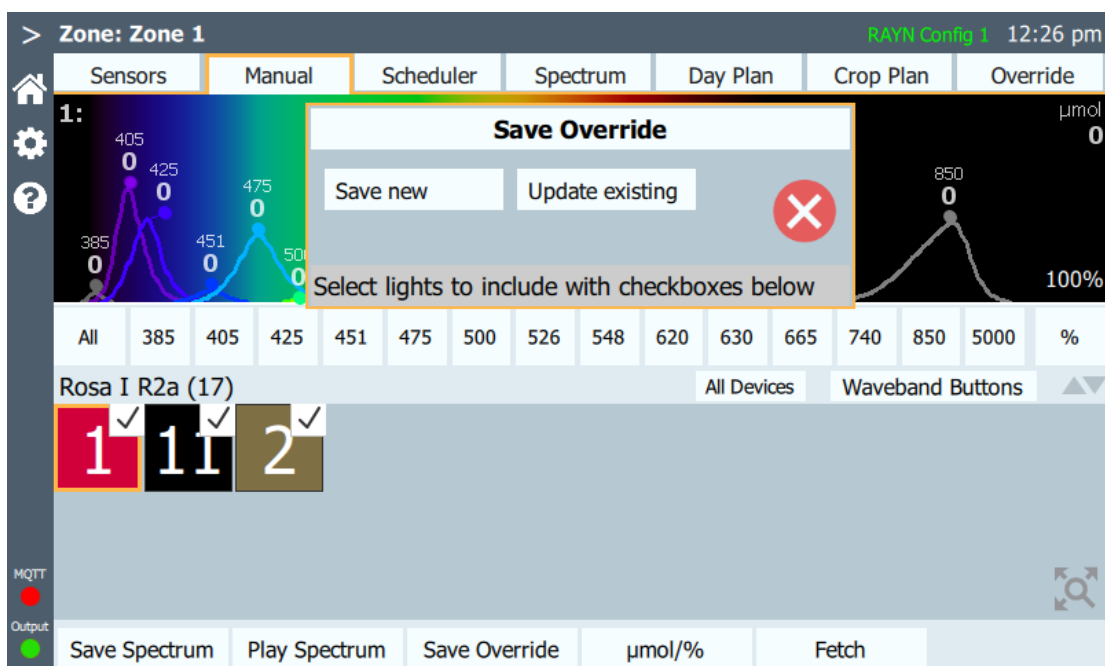
Manual > Save Override

Overrides include spectral values and intensities for adjustable luminaires, intensity values for simple single-channel dimmable luminaires and the on or off state of any relays connected to RAYN Syrcadia (see [Settings > Devices](#)). Once configured, a lighting state may be saved for future use.



Note: Overrides are not available in RAYN Syrcadia on PC in basic mode.

Overrides may be triggered manually from the Dashboard or from the Overrides tab (see [Zones > Overrides](#)). When activated, it will play back its recorded content and block timed activation from the Scheduler until the **Resume** button is pressed.



To save a new override, select **Save Override**, then select **Save New** and enter a name. Each override must have a unique name.



Note: *Entering the same name as an existing override will ask for confirmation before recording.*

To save over an existing override, select **Save Override**, then select **Update Existing**, then select the override name in the list. Select **OK** to confirm overwriting the previously recorded override.



Note: *For accurate available DLI calculation, before recording a spectrum ensure that the light level value from the sensor has been received corresponding to the levels just set, and are not persisting from a previous light level reading.*

Manual > $\mu\text{mol}/\%$

Select this button to toggle the display values for each waveband for calibrated fixtures between $\mu\text{mol}/\text{s}$ or percent. For devices without calibration data only the % display is available.

- **$\mu\text{mol}/\text{s}$ display** - shows the values from one device of the chosen type. When multiple devices are illuminating the same area the delivered μmol value will be higher than that shown.
- **μmol value** - the emission from the light (PPF in $\mu\text{mol}/\text{s}$) and not the flux arriving on the crop (PPFD in $\mu\text{mol}/\text{m}^2/\text{s}$), as that depends on the operating distance and other factors.

Manual > Fetch

The Fetch function is used to retrieve data from one zone and apply it to similar devices in the current zone. When fetched from a spectrum or override, RAYN Syrcadia will make a copy of that spectrum or override in the target zone. It is also possible to fetch manual levels from another zone, or to fetch recorded levels from another zone and bring those into the manual state for adjustment in the current zone.

Fetching data

Zone	Device
Zone 1	All
Zone 2	Device 3 Rosa I R2a
Zone 5	Device 4 Dimmer 0-10V
Zone 4	Device 5 Relay, no spectrum

From: Zone 2, All (3 4 5)
To: Zone 1, All (1 2 11)

To fetch data, start in the zone you want to bring data into. If needed, select the target devices. No selection will fetch to all devices of that type.

1. Select **Fetch**.
2. Select a source data type to fetch from between **Manual**, **Spectrum**, and **Override**. When fetching from the latter two options, the **Fetch to Manual** checkbox can be selected to also bring the fetched levels into the manual tab.
3. Select the source zone, the specific item to fetch, and the specific source device. The source is where the data originates from, which will be copied to the target (displayed in italics). Text in the lower left will summarize the actions about to be taken. A warning displays if the number of items in the source doesn't match the number of items in the target the data will be copied to.
4. Select the green check mark button to confirm or the red **X** button to cancel. When a fetch operation will overwrite existing data, a confirmation will appear.

Manual > Update & Resume

Updates the current spectrum with any manual changes, and resumes the scheduler.

Zones > Spectrum

Spectra include spectral values and intensities for adjustable luminaires, intensity values for simple single-channel dimmable luminaires and the on or off state of any relays connected to RAYN Syrcadia (see [Settings > Devices](#)).

This tab shows all recorded spectra in a list. Each spectrum indicates the stored name, a preview of the relative wavebands for the first 8 LED or dimmed devices connected to RAYN Syrcadia. Relay states are not indicated.

> Zone: Zone 1 RAYN Config 1 12:12 pm

	Sensors	Manual	Scheduler	Spectrum	Day Plan	Crop Plan	Override
+	Fruiting			0			+
?	Leaf Growth			218			🗑
	Flowers Redorange			361			🗑
	RO 2percent			2			🗑
	RO 5percent			10			🗑
	RO 10percent			25			🗑

To rename a recorded spectrum, select its name, then use the keyboard to enter the new name. Adjust the text selection using the slider bars to edit a specific portion of the text. Select the green check mark button to confirm the change. Select the red X button or press the name again to cancel.

To delete a spectrum, select the trash can icon at the right side of the item.

To create a new spectrum, select the + button at the upper right corner of this tab. RAYN Syrcadia will switch to [Zones > Manual](#). Once the spectrum is configured, select the **Save Spectrum** button.

Zones > Overrides



Note: RAYN Syrcadia on PC in basic mode does not support overrides.

Overrides include spectral values and intensities for adjustable luminaires, intensity values for simple single-channel dimmable luminaires and the on or off state of any relays connected to RAYN Touch (see [Settings > Devices](#)). Once configured, a lighting state may be saved for future use.

Overrides may be triggered manually from the Dashboard or from the Overrides tab. When activated, it will play back its recorded content and block timed activation from the Scheduler until the **Resume** button is selected.

This tab shows all recorded overrides in a list. Each override indicates the stored name, a preview of the relative wavebands for the first eight LED or dimmed devices connected to RAYN Syrcadia. Relay states are not indicated.

> Zone: Zone 1 RAYN Config 1 12:13 pm

	Sensors	Manual	Scheduler	Spectrum	Day Plan	Crop Plan	Override
+	Name	Content					+
?	All On						▶
	All Off						▶

To activate an override from this tab, select the play button to the right side of the item.

To rename a recorded override, select its name, then use the keyboard to enter the new name. Adjust the text selection using the slider bars to edit a specific portion of the text. Select the green check mark button to confirm the change. Select the red X button or press the name again to cancel.

To delete an override, select the trash can icon at the right side of the item.

To create a new override, select the + button at the upper right corner of this tab. RAYN Syrcadia will switch to the Manual tab (see [Zones > Manual](#)). When configured, select the Save Override button (see [Manual > Save Override](#)).

Zones > Day Plan



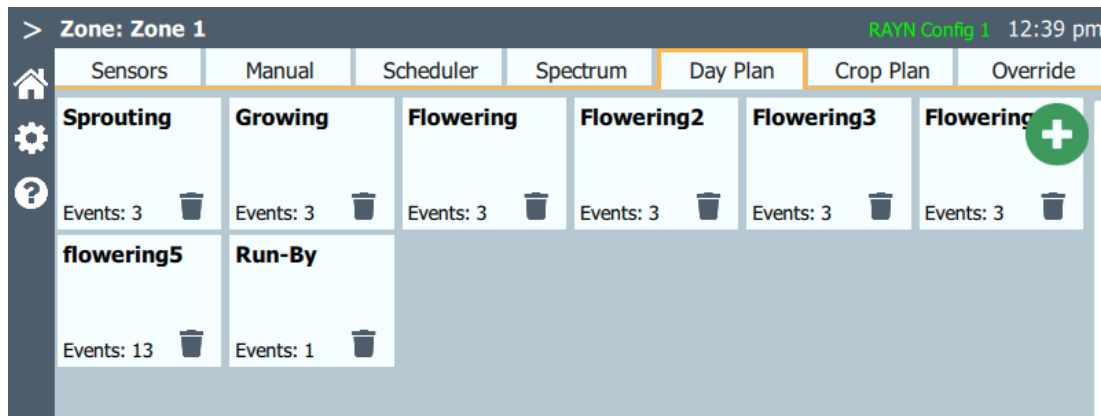
Note: RAYN Syrcadia on PC in basic mode supports a single day plan. This tab will open directly into the Day Plan editor in basic mode installations.

A day plan defines what spectrum will be activated in a zone at what time within a specific 24-hour period. Day plans may also be given an auto DLI target value to achieve.

Days can be used in crop plans for a full grow cycle, or loaded directly into the scheduler (see [Zones > Scheduler](#)).

Day plans can also activate setpoints (see [Settings > Setpoints](#)), functions (see [Settings > Functions](#)), and outputs (see [Settings > Outputs](#)) to control connected devices (see [Settings > Devices](#)).

Creating and Editing Day Plans



Select the + button in the upper right corner of this tab to add a new untitled day. Select the day tile to edit the day's settings. Select the trash can button on a day tile to delete that day plan.

Day: **Sprouting**

Day length: **24:00**

+

Type	What	When		
Spectrum	Select an item	12:01 am	0:02	
Analog	Entrance Light: 50	08:00 am		
Spectrum	Fruiting	10:00 pm	0:02	

✓

To specify a day name, a day length, or an auto DLI target, select the day to open the editor and press the pencil button to the right of the desired field in the upper left corner. Type the name, day length, or target value, and then select the green check mark button to confirm. Select the red X button to cancel.

Day Plan Steps

To add new steps to the day plan, select the green + button in the upper right corner of the editor. To edit an existing step, select the step to select it, and use the boxes at the top of the day plan window to make the desired changes. To delete a step, select the trash can icon on the step to be deleted. When editing is completed, select the green check mark button in the lower right corner of the editor to return to the Day Plan tab.

Day: **Sprouting**

Day length: **24:00**

+

Type	What	When	Fade Time	
Spectrum		12:01 am	0:02	
Spectrum	Select an item	12:01 am	0:02	
Analog	Unit: 50	08:00 am		
Spectrum	Fruiting	10:00 pm	0:02	

✓

A variety of step types and options are available:

- **Spectrum** - activate a spectrum.
 - **What** - an existing spectrum in [Zones > Spectrum](#).
 - **When** - the time the spectrum will activate.
 - **Fade Time** - the time it will take for the spectrum to fade in.
- **Switch** - turn a relay on or off.
 - **What** - an existing relay in [Settings > Devices](#) or MQTT output device in [Settings > Outputs](#).
 - **Value** - on or off.
 - **When** - the time the device will switch on or off.
- **Analog** - send a level to a dimmer.
 - **What** - an existing dimmer in [Settings > Devices](#) or MQTT output device in [Settings > Outputs](#).
 - **Value** - dimmer level expressed as a percentage (0-100).
 - **When** - the time the dimmer will go to the specified level.
- **Setpoint** - set a specific measureable value to be monitored by a function in [Settings > Functions](#).
 - **What** - an existing setpoint in [Settings > Setpoints](#).
 - **Value** - any numerical value. If the measured value goes a specified amount above or below the setpoint value, an associated function can activate or deactivate other devices in your system.
 - **When** - the time the setpoint will be set to the specified value.
- **Repeat** - turn a device on at regular intervals.
 - **What** - an existing device in [Settings > Devices](#).
 - **When** - the time the device will first turn on.
 - **On** - how long the device will stay on, measured in seconds, minutes, hours, or days.
 - **Interval** - how long after the device turns off before it turns on again, measured in seconds, minutes, hours, or days.
- **Stop** - turn a device off at a specific time.
 - **What** - an existing device in [Settings > Devices](#).
 - **When** - when the device will turn off.

Zones > Crop Plan

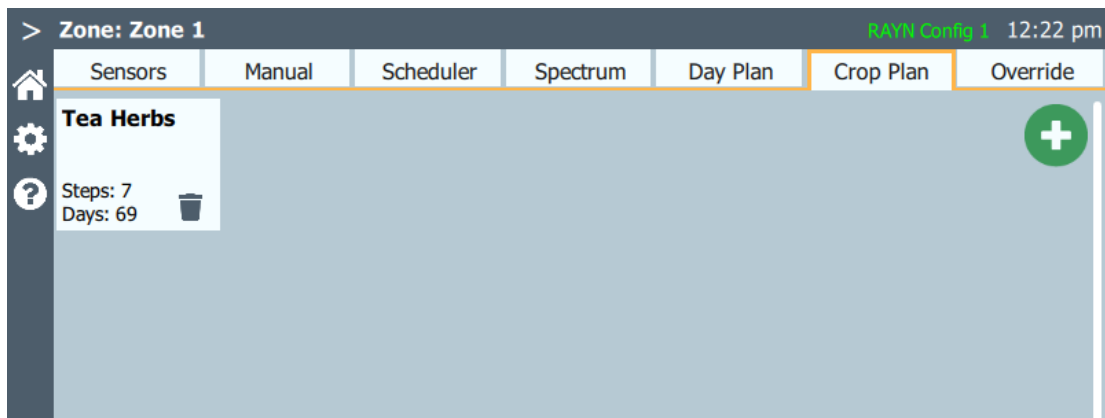


Note: *RAYN Syrcadia on PC in basic mode does not support crop plans.*











A crop plan defines a repeating schedule of day plans.

Crop plans are loaded into the **Scheduler**.

Select the **+** button in the upper right corner of this tab to add a new untitled crop. Select the crop tile to edit the crop's settings. Select the trash can button on a crop tile to delete that crop plan.



To name the crop, select the crop to open the editor then select the pencil button to the right of the Crop Plan field in the upper left corner. Type the crop plan's name and then select the green check mark button to confirm. Select the red X button to cancel.

Crop Plan: Tea Herbs 			
Day Plan	Repeat		
Sprouting	10		
Growing	15		
Flowering	1		
Flowering2	1		
Flowering3	1		
Flowering4	1		
flowering5	40		
			

To add new steps to the crop plan, select the green + button in the upper right corner of the editor. Select the Day field at the top of the editor to assign a day plan to the selected step. Select the Repeat field to enter the number of iterations of that day within the crop plan.

To edit an existing step, select the step to select it. Select the Day field at the top of the editor to assign a day plan to the selected step. Select the Repeat field to enter the number of iterations of that day within the crop plan.

To delete a step, select the trash can icon on the step to be deleted.

When editing is completed, select the green check mark button in the lower right corner of the editor to return to the **Crop Plan** tab.

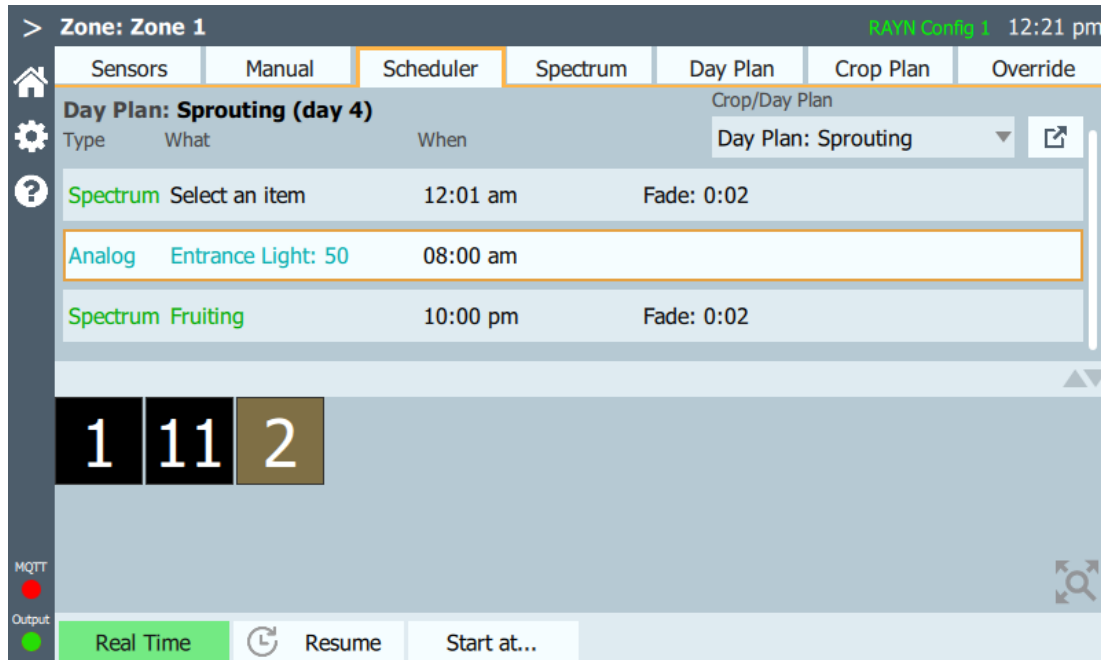
Zones > Scheduler

The Scheduler is where spectra are activated based on a time within a day plan. It can run either a crop plan (containing a series of days with repeat counts) or a day plan (the same 24-hour schedule played back over and over).



Note: RAYN Syrcadia on PC in basic mode supports a single day plan which is automatically assigned to the Scheduler.

Load either from the Crop/Day Plan drop-down menu in the upper right corner. Select the configuration button to the right of the selected plan to jump to the editor for that plan. Select the **Real Time** button to start the plan running.



The screen is in two parts, upper and lower, separated by a horizontal bar. The upper part shows the Day Scheduler and the lower part the device grid. Move the horizontal bar up and down to suit your display layout by selecting and dragging the up and down arrows on the right hand side of the bar.

The device grid may be zoomed and moved by using two fingers to pinch or pan. When devices are magnified, they show their name, a color simulation and spectrum content; when their size is reduced, the spectrum and name will disappear.



Note: The spectrum shown in a device box in the lower section is not a spectral graph but a set of bars showing the relative control levels for each waveband.



Note: Relay devices are shown in black (off) or white (on).

Available controls in the scheduler:


- [Scheduler > Real Time & Automatic](#)
- [Scheduler > Advance](#)
- [Scheduler > Go to](#)

Scheduler > Real Time & Automatic


The RAYN Touch controller includes a real time clock which keeps time and date settings even while the unit is off and unpowered. This clock will control when events from the day and crop plans are activated by RAYN Touch.

Once the system is configured, it is recommended that the real time clock remain enabled.

Real Time

A green rectangular button with the text "Real Time" in white.

When real time is on (indicated by a green button), the scheduler will follow the actual time, executing the spectrum of the current time and day. The time of day must be set up in [Settings > Preferences](#).

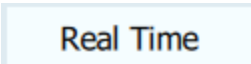

A light blue rectangular button with the text "Real Time" in dark blue.

When real time is off, the clock will continue to run internally but will not control the activation of the output. The **Advance** button may be used to manually advance the day's sequence in order to view the output for testing and verification (see [Scheduler > Advance](#)).



Automatic

In any day plans that are not 24 hours long, the **Real Time** button becomes the **Automatic** button. Automatic time tracks nonstandard day lengths with the same functionality that real time offers for 24-hour days.

Scheduler > Advance

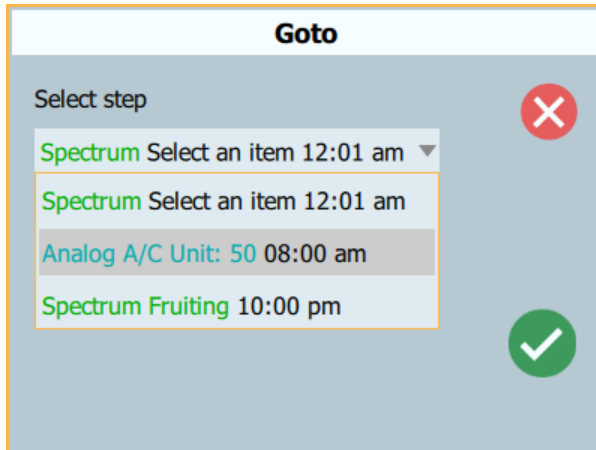
A light blue rectangular button with the text "Real Time" in dark blue.A light blue rectangular button with the text "Advance" in dark blue.

With **Real Time** (or **Automatic**) off, the **Advance** button allows you to step through the steps of a day to manually check the outputs.

A green rectangular button with the text "Real Time" in white.A light blue rectangular button with the text "Resume" in dark blue.

With **Real Time** (or **Automatic**) on, the **Advance** button becomes a **Resume** button, to come out of an override and resume automated activation of spectra based on the day or crop plan.

Scheduler > Go to



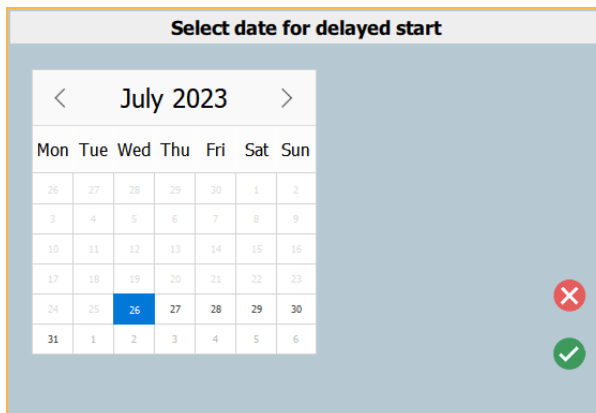
Activates a selected spectrum from the day or crop plan currently assigned to the scheduler.

- If the Scheduler is playing a day plan, the Go to command will activate a step within that plan.
- If the Scheduler is playing a crop plan, the Go to command will activate a specified day or iteration from that crop plan, based on the time of day.



Note: *RAYN Syrcadia on PC in basic mode does not support crop plans.*

Scheduler > Start at



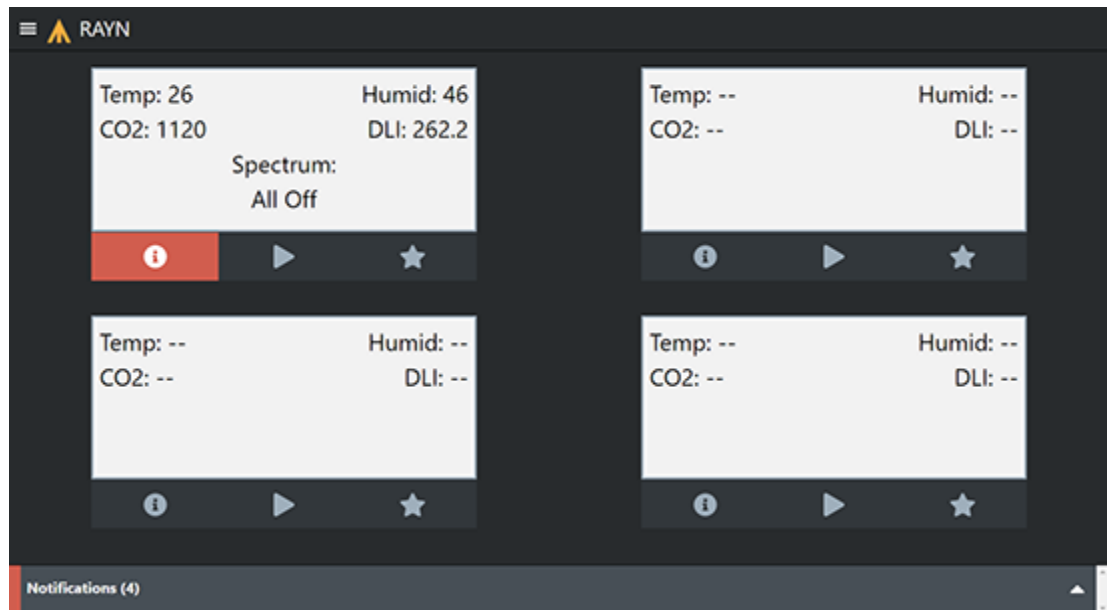
Use the calendar to choose a start date for the specified day plan. If the day plan uses a non-24-hour day length, the starting time may also be defined.

RAYN Syrcadia Remote

The RAYN Syrcadia Remote is a web-based application allowing you to control RAYN Syrcadia from a web browser on a device connected to the same network.



Note: *The Remote can be accessed on phones or tablets in portrait or landscape mode, which may cause the layouts to look slightly different than shown here.*



Connecting to RAYN Syrcadia

First, ensure that your mobile device is on the same subnet as your RAYN Touch controller or RAYN Syrcadia PC, and has an IP address compatible with that subnet. The controller's network settings can be noted or altered via **Settings > Preferences > Network**. If using a PC, the network settings are found in Windows settings.

Once your mobile device's information is correct, scan the QR code in **Settings > Preferences > Remote** to be taken to the web-based app.

PIN Codes

PIN codes can be used to limit the remote's available interactions with the RAYN Syrcadia.

When the **Use PIN codes for login** setting is enabled on **Settings > Preferences**, one of the two PINs will need to be entered when the app is opened in order to use the remote.

Using the Remote

The **Home** page of the remote behaves similarly to the [RAYN Syrcadia Dashboard](#), showing the status of each zone and accompanying alert, spectrum, and override indicators. Any [Dashboard > Notifications](#) can be expanded by tapping the **Notifications** bar at the bottom of the screen.

At any time, you can return to the **Home** page by tapping the menu icon in the top left of the screen. This menu also provides version information for the remote app. You can also return to **Home** by tapping the RAYN logo to the right of the menu icon.

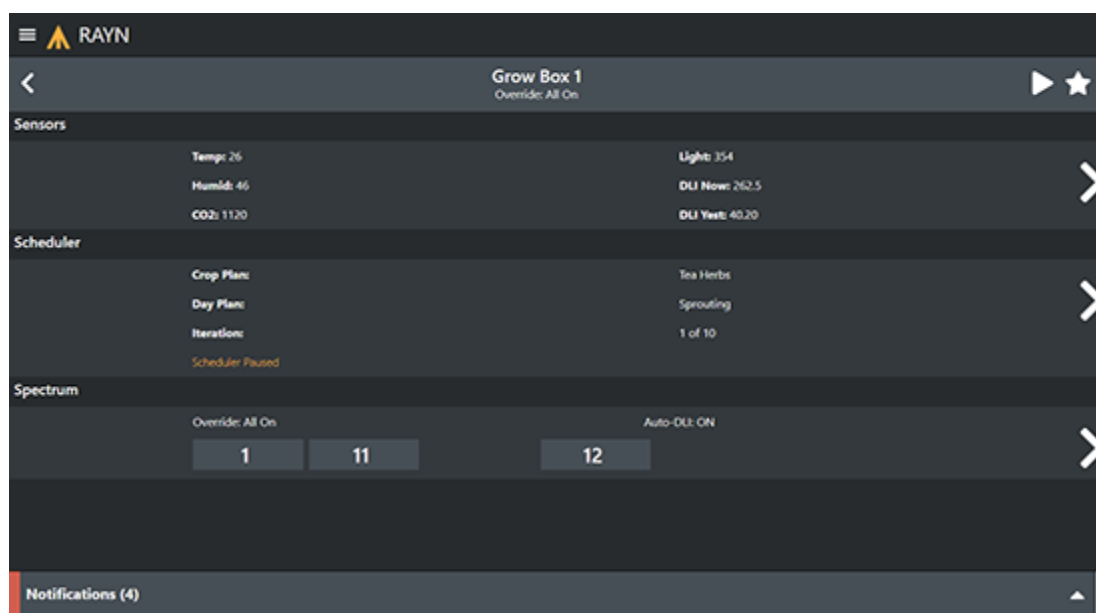
Overrides Menu (Star Icon)

The overrides menu is accessible via the star icon in the zone overview toolbar, or in the top right of any page once a zone is selected. This button will take you to a list of all associated [Zones > Overrides](#), and allow you to activate them.



Note: RAYN Syrcadia on PC in basic mode does not support overrides.

Zone Overview



Tapping any of the zones will take you to an overview page with details about the zone and its associated devices, scheduler data, and spectra. See [Settings > Devices](#), [Zones > Scheduler](#), and [Zones > Spectrum](#) for further details and control options.

Sensors

This section provides an overview and controls of the selected zone's sensor data, similar to the [Zones > Sensors](#) tab of RAYN Syrcadia.

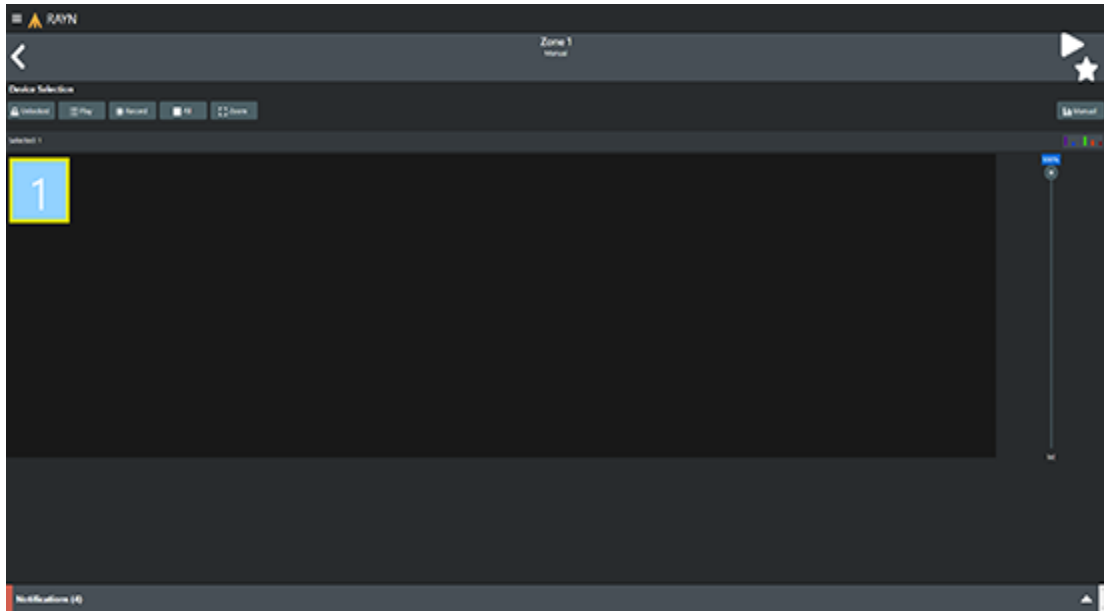


Note: RAYN Syrcadia on PC in basic mode does not support sensors.

Scheduler

This section provides an overview of the selected zone's scheduler data, similar to the [Zones > Scheduler](#) tab of RAYN Syrcadia.

Spectrum



This section provides an overview of the selected [Zones > Spectrum](#) information, and optional controls similar to the [Zones > Manual](#) tab of RAYN Syrcadia.

Device Selection

This section allows control over one or more of the selected zone's patched devices. The following options are available:

- **Locked/Unlocked** - tap to toggle control of the zone's devices on or off.
- **Play** - displays a list of associated spectra, which can then be played.
- **Record** - displays a list of associated spectra, which can then be overwritten.
- **All** - selects all device tiles at once.
- **Zoom** - resizes the device tiles to fit them to the screen size.

Devices can be selected directly by tapping one or more of the device tiles. Selected devices can then be controlled using the intensity slider to the right. The device topology can also be freely zoomed and/or panned to change which device tiles appear.



RAYN Growing Systems | 3031 Pleasant View Rd, PO Box 620979, Middleton WI 53562 0979 | +1 844 907 RAYN
© 2023 RAYN Growing Systems, LLC. | All Rights Reserved | Support support.etconnect.com/RAYN
Trademark and patent info: rayngrowingsystems.com/ip | Third-party license agreement info: etconnect.com/licenses
All product information and specifications subject to change. RAYN Growing Systems intends this document to be
provided in its entirety.
7437M1210-2.2.0 Rev A Released 2023-11

rayngrowingsystems.com