SOLARSYSTEM

CONTROLLER USERS GUIDE

CALIFORNIA LIGHTWORKS
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Congratulations for purchasing the California LightWorks SolarSystem LED Grow Light. The SolarSystem is the most efficient, productive and technologically advanced LED grow light available.

The SolarSystem lights can be operated manually or programmed for digital on/off, dimming, and independent spectrum control using the Controller.

Please DO NOT operate the unit without reading ALL the Information contained in this **SolarSystem Users Guide** and the corresponding **SolarSystem Product Manual** carefully**.**

The touch screen of the SolarSystem controller is made of a thin glass sheet, and it is very fragile - a small crack or break will make the entire touch screen unusable. Don't drop or roughly handle the controller. When pressing on the touchscreen, you should be able to use the tip of your fingers. DO NOT press HARD on the screen. It WILL crack and this is NOT COVERED by our Warranty.

Technical Questions?

Please contact us via email: support@californialightworks.com

Table of Contents

1.0 Specifications & Performance

	SolarSystem 1100	SolarSystem 550	SolarSystem 275
Input Voltage	120-240VAC	120-240VAC	120-240VAC
Max Current	6.6A @ 120V 3.3A @ 240V	3.3A @ 120V 1.65A @ 240V	1.65A @ 120V 0.9A @ 240V
Operating Frequency	50Hz - 60Hz	50Hz - 60Hz	50Hz - 60Hz
Power Consumption	800Watts	400Watts	200Watts
Total PPF Output* (uMoles/s)	1284	642	325
Efficiency* (uMoles/s/W)	1.70	1.70	1.70
Weight	26 lbs	13 lbs	7 lbs
Dimensions	18" x 17" x 4"	18" x 8.5" x 4"	9" x 8.5" x 4"
Operating Temperature	0°F to 130°F (-18°C to 45°C)	0°F to 130°F (-18°C to 45°C)	0°F to 130°F (-18°C to 45°C)
Warranty	5 years	5 years	5 years
Power Factor	> 0.95	> 0.95	> 0.95

*Efficiency at full power

2.0 Installing the SS 550

2.1 What comes in the box?

When you open the box you will find: 1-SolarSystem fixture, 1 - 6’ Phone (data)cable, 1 6’ Power cable, 2 steel hangers, and documentation.

The Controller Box contains: 1 – SolarSystem Controller, 1 controller holder, 1 - 14' phone (data) Cable, 1 - AC Adapter, and Documentation.

2.2 Mode Switch – Operating with No Controller

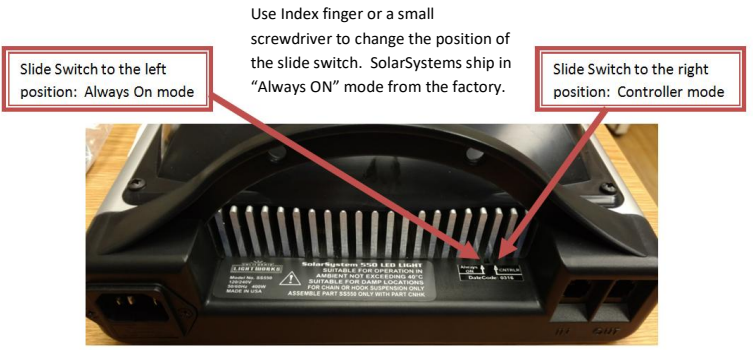
On one end of the SolarSystem light you will see the Operating Mode switch at the bottom of the heat-sink with a label marked "Always ON and CONT."

In "Always On" mode, (the switch slid to the Left) the SolarSystem light will operate at Full power (all channels at 99%) and will not respond to commands from the SolsrSystem Controller.

In "Controller" mode, (the switch slid to the Right) the SolarSystem light will respond to all commands received from the SolarSystem Controller and will remember the last command received when power is removed. When power is reapplied*, the unit will restart in whatever state it was in prior to the power being removed.*

The SolarSystem light will not remember any commands issued to it if the power to the unit is off.

NOTE: The SolarSystem light system ships with the Operating Mode switch in the "Always On" position.



2.3 Hanging the SolarSystem LED

The 2 metal hangers provide a stable 2-point connection to the light that can be suspended using chain hangers, cables, carabineers etc., (suspension systems not provided) from a ceiling or structure capable of handling at least twice the weight per light: 52lbs for SS1100, 26lbs for the SS550 and 14 lbs for the SS275) You can also purchase ratchet hooks sold separately from California LightWorks to suspend your luminaries (CLW part # **CHNK**)

When attaching the steel hangers into the holes in the End caps, please insure the hangers are inserted all the way through the holes before releasing.

A single point connection can be made to either of the two holes on each side to suspend the light at an angle to control light wash when necessary.

Do not operate the luminaries close to flammable materials. The fixture can get hot to the touch without damage so please exercise caution when handling the system, during or shortly after operation.

NOTE: AT LEAST 4" of clearance (air space) above the unit and 6" from the heat-sinks on each end must be maintained at all times to insure proper airflow and cooling.

2.4 Environmental Conditions - Operating Requirements

The temperature of the fixture is the most important parameter for lifetime and reliability. A normal operating environment temperature should be maintained below 104 deg. Fahrenheit (40 deg. Celsius). Exceeding this maximum environmental temperature will stress the electronic components, which can lead to shorter life expectancy and decreased reliability, for short durations, no harm should be expected. The SolarSystem has a built-in internal over-temperature protection sensor. Should the heat sink temperature exceed 149 deg Fahrenheit (65 de Celsius) the system will shut down until the system cools down, after which it will restart. For more information, please consult the SolarSystem Product Manual.

2.5 Mounting Heights, Spacing and Lighting Distribution

NOTE: *Minimum Distance from canopy* – A minimum distance of 16" should be maintained *from the highest point in the canopy* at all times to insure proper blending of light and to prevent any light stress.

Fixed Area Lighting

In applications with rows of canopy with isles on each side, such that the light must be kept from spilling into isles, the units should be mounted at a height that will create a light footprint of the narrow dimension of the row.

For example, in a continuous row of 4'x8' flood trays, the smallest dimension is 4' so you would mount the fixtures at a height that will produce a footprint roughly 4' wide or typically a height of 24"-30" above the ***average top height*** of the canopy. Then the lights would be spaced down the row such that the lighting provides the desired amount of power density per square foot.

Diffused Lighting Approach

However, this example with rows of canopy with isles on each side is the LEAST effective way to light canopy from the perspective of the lighting. All light fixtures, LED AND HID, are brighter in the center of their luminance footprint and drop off as you move outwards. If the lights are mounted close and directly above the canopy as previously described, this light stratification is impossible to avoid because each plant only sees light from the fixture directly above.

The ideal approach for all types of lighting is to literally fill a highly reflective room cavity with canopy and *provide only one isle that can be moved around in the room* to provide plant access. This design can be accomplished in several ways, using moveable tables, flood trays on wheels, or for larger plants literally putting each plant on wheels (my personal favorite), and these approaches depend greatly on what media/watering system is being employed. With larger well shaped plants, a person can simply move between the plants beneath the canopy without moving anything.

The advantage of this approach is the lights can then be raised to the minimum *optimum* height of 3-4' above the canopy or even higher. By raising the light to at least 3-4', the patterns of multiple lights begin to overlap each other and provide a much more even lighting level as well as providing a greater level of diffusion, i.e. light coming from multiple directions instead of just straight down. Diffusion, not power creates real canopy penetration and eliminates shading, and it can dramatically improve a plants light absorption efficiency and ultimately yield. No other factor in a grow as greatly influences yield as making sure every flower sight sees optimal light levels from multiple directions to minimize canopy shading.

What about light losses to the walls? This design assumes high reflectivity walls (>90%) and as long as the walls are reflective, the losses from bounces off the walls should not exceed 2-3%. This minimal loss is a small sacrifice in exchange for the dramatic reduction in canopy shading that comes from getting the light footprints to overlap.

Please contact a California LightWorks Applications expert for more details on mounting heights and approaches.

Commercial Lighting Power Density

For Flowering Plants - each SS1100 at 800w will light a 4' x 4' area or roughly 16 sq ft of canopy in flower, or ~8 sq ft. per SS 550 unit (~50w/ sq. ft) with 50-75w of headroom for utilizing spectrum control. Please note**:** The optimum amount of power per square foot of canopy is NOT a hard fast rule and can increase or decrease somewhat depending on numerous factors including strain, canopy depth, and room reflectivity. But roughly 700 watts of our lights can replace 1000w of HPS and this is the generally accepted standard for 4'x4' of flowering canopy.

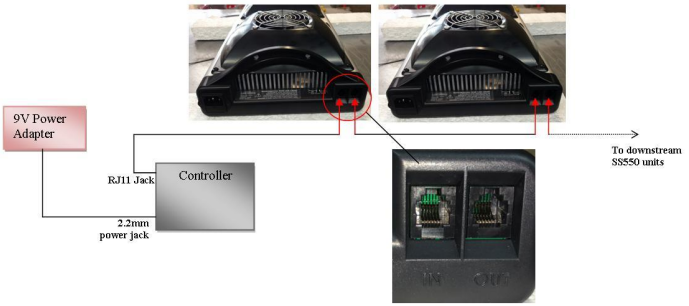
For Vegetating Plants - Power density requirements for other stages of growth besides Flower can vary from grower to grower, and is dependent on how large the plants are to be vegged before flowering and how fast they have to get there, so there is no hard fast rule for Veg lighting. In general practice, Veg power densities range from a minimum of 50% to as high as 100% of flower power densities.

NOTE: These Commercial recommendations are designed to provide the yields and quality traditionally associated with a 1000w HPS lamp over a 4'x4' tray of canopy. Lighting levels can always be varied from this standard with respective changes in yield and/or quality.

2.6 Connecting the SolarSystem Communication Network

The SolarSystem uses a simple and robust, hard-wired serial communications protocol distributed to a ZONE of lights (i.e. all the lights that are to be operated identically by one controller) through standard RJ11 cables (**RJ11 Phone Cable 6P4C Straight-through for Data**).

The communications cables are connected as follows. The SolarSystem Controller is mounted in a convenient location and powered. One RJ11 cord is ran from the RJ11 jack of the SolarSystem Controller to the "IN" RJ11 jack of the first SolarSystem light in the chain. Then a second RJ11 cord is connected from the "OUT" RJ11 jack of that SS550 to the "IN" jack of the next SolarSystem light, and so on for the entire chain (ie. control zone). The "OUT" jack of the last SolarSystem light unit in the chain is left unconnected.



NOTE: If any SolarSystem unit in the chain loses power, the communications will not be interrupted to downstream units.

However, if any RJ11 cord is unplugged in the chain, all communications will be lost to all units downstream from that point.

If the SolarSystem loses power, ALL communications will stop until power is reapplied to the SolarSystem Controller, and all connected SolarSystem units will continue to operate in the mode of the last command they received until new commands are issued by the controller when power is restored.

The Controller is the brain of the system, so it is recommended that you power the controller from the same power circuit that is used for all SolarSystem lights. This way if power is lost to the circuit, the lights and controller will be off avoiding a situation where the lights stay on during the dark period.

2.7 Electrical Considerations & Operation

NOTE: Please read the corresponding **SolarSystem Product Manual** before first applying power to the SolarSystem light.

Each cord from a SolarSystem LED should be plugged into an appropriate 120vac or 240vac receptacle. Extension cords are NOT RECOMMENDED for use with the SS LED.

NOTE: Most local electrical codes recommend that no Electrical circuit be loaded to a amperage level more that 80% of the rated capacity. For a 20 amp 120vac circuit that would be 16 amps. Ex: The SS 550 consumes 3.3/1.65 amps at 120/240vac. Consult your local electrical codes or a qualified electrician for proper circuit loading and wiring.

The SolarSystem LEDs can be used with a new or pre-existing properly sized 2-pole Lighting Contactor, Light Controller, or Timer. To do so the SolarSystem can be either operated in

"Always On" Mode, (units operate just like an HID system) or if used in "Controller" mode, the SolarSystem Controller can be used to change the spectrum or dim the SolarSystem while the Contactor and external clock handle the Master on/off function.

3.0 Using the SolarSystem Controller

3.1 Key Functions – Overview

ADJUSTABLE SPECTRUM CONTROL

The SolarSystem has 3 separate channels of spectrum control, RED, BLUE, and WHITE.

1) The RED channel controls all the Red AND Far Red LEDs.

2) The BLUE channel controls ALL the Blue and Deep Blue LEDs.

3) The WHITE channel controls all the White LEDs and just a small amount of Red LED's to correct the Color temperature of the cool white LEDs to a 5000K for more accurate plant inspection.

The spectrum can be programmed manually for a single setting or automatically for changing light spectrums to match natural sunlight transitions during the day.

AUTOMATIC 24 HOUR PROGRAMING

The controller provides up to 20 program steps to allow varying the spectrum mix up to 20 times in a 24-hour period. Various spectrum mixes can be saved and labeled and programs will run automatically over a 24-hour period. The 24 hour programs reflect the spectrum mix to be used in a *specific growth phase* such as Flower, Veg, Ripen, Spring, Fall, etc. and can be labeled with up to 8 character names. Up to 10 of these Programs can be saved and then combined to cover an entire grow from Seedling to Harvest. Battery back-up saves the Program if power is lost.

AUTOMATIC DAY/WEEK/MONTH CALENDAR PROGRAMS

The SolarSystem Controller Calendar function can be programmed to combine the saved 24 hour Programs into grow routines spanning days, weeks or an entire season.

BUILT-IN DIGITAL TIMER

The Controller controls the On and Off times *digitally* without the need of a lighting contactor, lighting controller or external time clock. When using the Controller, the SolarSystem LEDs are powered directly from unswitched 120 or 240vac outlets.

SUNRISE/SUNSET TRANSITIONS

Morning Fade-up and Evening *Fade-down* with adjustable Fade duration can be utilized to simulate sunrise and sunset transitions. It is suggested that plants can benefit from gradual on and off, and a slow fade to off in particular can help minimize humidity spikes that often happen when the lights are turned off abruptly.

VIEW MODE

A single soft button marked "View" switches the spectrum to a pure white "View Mode" for working in the garden or inspecting plants. Spectrum will automatically revert back to the grow spectrum setting after a user definable time period. To set the View Mode timer, touch the MANUAL button and in the MANUAL screen you will see a box in the center bottom with a timer. If you touch that box a new screen will appear with a white number box with "(minutes)" beneath it. Use the + - buttons to adjust the time period the view mode will stay on before it reverts back to the programmed spectrum. The timer setting can be saved by touching the SAVE button. The Button marked OVERRIDE, if touched, will put the controller in View Mode PERMANENTLY, and revert you to the Manual Mode Screen with the OVERRIDE indication at the bottom. The lights will stay in this mode until you touch the OVERRIDE button a second time. So Beware! If you activate the OVERRIDE mode, the lights will NOT automatically revert to the programmed spectrum until the OVERRIDE Button is touched again.

3.2 Operation Without a Controller – Mode Switch

The SolarSystem lights can be used with a properly sized and grounded Lighting Contactor, Light Controller or External Timer. To do so the SolarSystem light can be either operated in "Always On" Mode, (units operate just like a HID system) or if used in "Controller" mode, the SolarSystem Controller can be used to change the spectrum or dim the LEDs while the contactor and external clock handle the master on/off function.

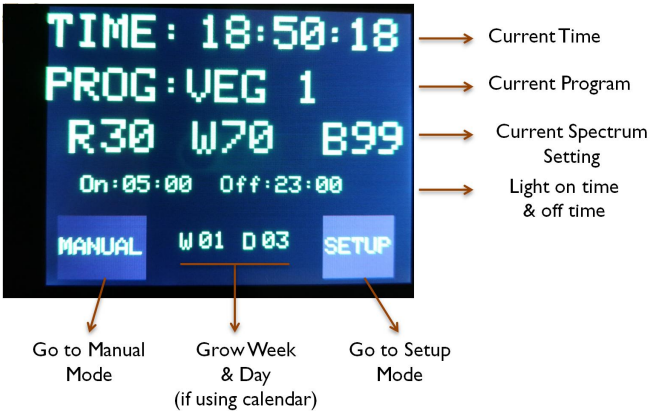
To run in "Always On" Mode, on one end of the SolarSystem you will see the Operating Mode Switch at the bottom of the heat-sink with a label marked "Always ON" and "CONT"

In "Always On" mode, (the switch slid to the left) the SolarSystem will operate at full power (all channels at 99%) and will not respond to commands from the SolarSystem Controller.

In "Controller" mode, (the switch slid to the Right) the SolarSystem will respond to all commands received from the SolarSystem Controller and will remember the last command received when power is removed. When power is reapplied*, the unit will restart in whatever state it was in prior to the power being removed. The SolarSystem unit will not remember any commands issued to it if the power to the unit is off*.

3.3 Using the SolarSystem Controller - The Home Screen

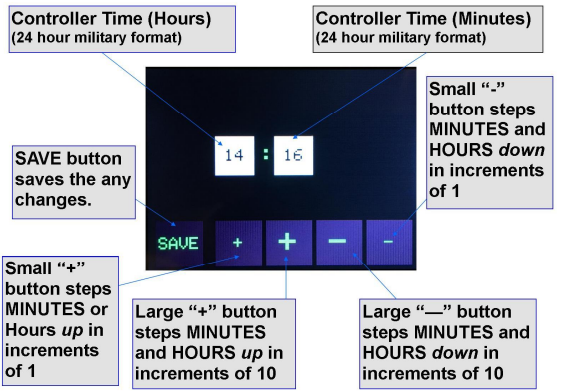
When you first power up the controller you will see the Home Screen below. There are 5 lines of information, and 2 control soft buttons at the bottom. The controller screen is touch sensitive. In general, touching the blue soft Buttons DO things. Touching the various display boxes can Select them for control by the + - buttons at the bottom, and they change color when selected.



NOTE: R/W/B displays only shows 2 digits for lighting levels so 99 is actually 100% or full power, 1 is 10% or minimum power. 0 is off.

3.4 Setting the Clock

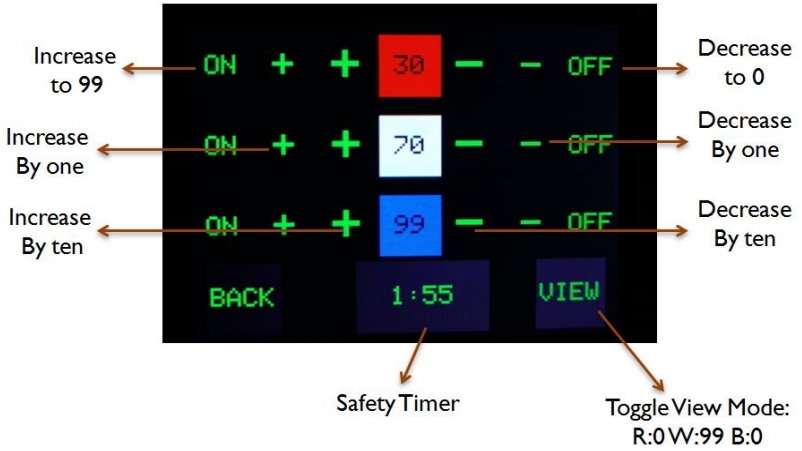
On the HOME page, touch the button marked SETUP. Touch the SET TIME button in the menu which will take you to the SET TIME Page. Set time using the + - buttons. Hit Save.



3.5 Manual Mode Color Spectrum Selection and View Mode

The simplest way to use the spectrum control features of the SolarSystem is by using the MANUAL MODE. Manual mode functions like 3 digital dimmers, RED, WHITE, and BLUE. To enter MANUAL mode from the HOME page touch the left MANUAL button. –

- *MANUAL MODE Page* -



You'll notice the three boxes in the middle of the screen representing the 3 channels of spectrum control - RED, WHITE and BLUE. This page allows you to manually control the spectrum. Changes to this screen will continue indefinitely unless changed manually or programming is created to change them.

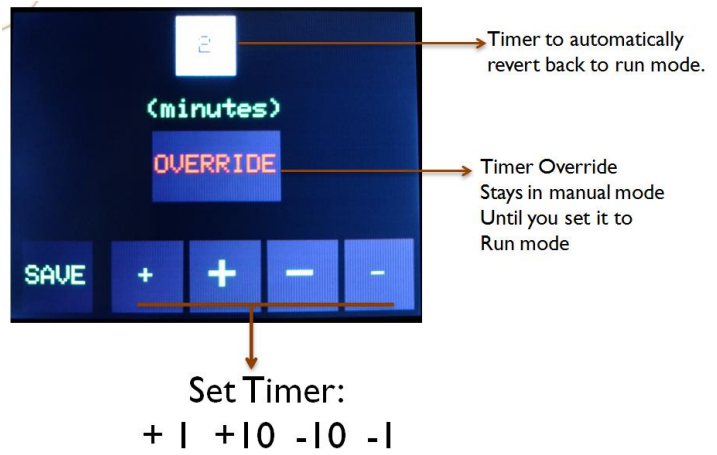
It's possible to use your SolarSystem unit(s) with a controller in manual mode with external lighting contactors (controller) boxes. The SolarSystem is designed to always keep its current spectrum state when it's disconnected from power. So when the lights are powered down then powered back on, they will revert back to their last state.

NOTE: When the Controller is placed in MANUAL mode, *any and all programmed events are suspended until the Controller is taken out of MANUAL mode*. Also, if you change the setting in manual mode then go back to Run mode, the light setting will remain in the Manual setting until the next programmed transition event.

VIEW MODE

View mode sets the White channel to 99 and the Red and Blue to zero for easy viewing and working in the garden. To use the View Mode, first you will want to set the View Mode safety timer. You can do this by touching the timer countdown box in the lower middle part of your screen. That will take you to the View Mode Timer & Override Screen.

- VIEW MODE TIMER / OVERRIDE Screen -



Use the + - buttons to set the View Mode safety timer. You can select from the default 2 minutes to a maximum of 120 minutes. Press SAVE to store this setting and go back to the MANUAL Mode Screen. This timer setting will now start counting every time View Mode is actuated. If you wish to keep the lights in View Mode indefinitely, press the OVERRIDE button. The OVERRIDE button will make the lights stay in VIEW Mode until the OVERRIDE button is touched a second time. BEWARE! Programming changes will NOT function in OVERRIDE mode.

3.6 Basic Spectrum Control Settings for Flowering Plants

What follows are some basic Spectrum mixes for various growth stages for flowering plants. These Spectrum mixes have been determined from 8 years' experience with our professional grower network, and are supported by various university studies.

Growth Stage	Week No.	RED	WHITE	BLUE
Vegetative	Varies	50	99	99
Pre-Flower	1 & 2*	74	99	99
Flower	3 to 6*	99	99	60
Ripen (finish)	7 to 8*	60	99	99

In general, Blue promotes leaf and root growth and is essential in Veg. Red promotes Stem, fruit and flower and so tends make plants stretch in Vegetative growth, but is key to high yields in fruit or flowering plants.

NOTE: These spectrum changes assume that you are using enough power (~8sq ft canopy / SS550) to have the headroom necessary to allow for dimming while preserving minimum power requirements for commercial yield/quality.

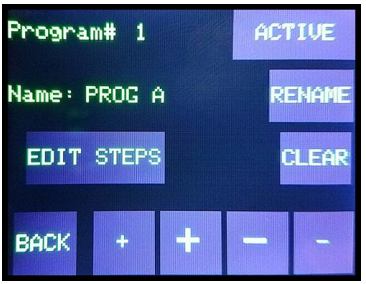
**** Weeks are based on an 8-week Flower cycle.*** *Visit the CLW website for more advanced information on using Spectrum control to optimize your results*

3.7 Spectrum Control and Timer for 24 Hour Program Cycles

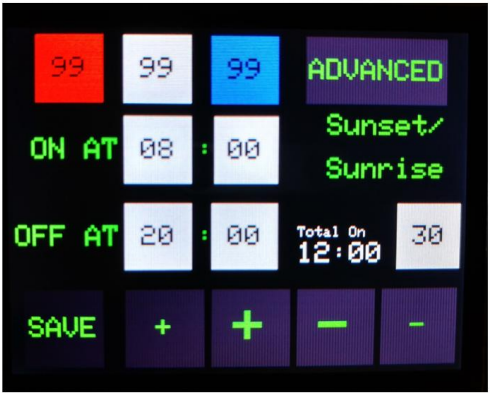
One powerful feature of the SolarSystem controller is that it allows you to operate your SolarSystem lights digitally without a separate Lighting Contactor. The SolarSystem LEDs are simply plugged into appropriate AC outlets and the SolarSystem Controller will control the on/off times DIGITALLY for all lights as well controlling more sophisticated dimming and spectrum variations.

The simplest way to do On/Off control is to use a single program that repeats every 24 hours. From the *HOME SCREEN* touch SETUP,

on the *SETUP SCREEN* touch EDIT PROGRAMS soft button. (Please note: Soft BUTTONS always have a Blue box around them non-changeable displays do not)



Then touch the EDIT STEPS soft button.



The top three Red/White/Blue boxes allow you to change the spectrum. Click on each box that you would like to change and you'll notice the numbers in the box turn blue. Now you can use the + - buttons at the bottom of the screen to change them similar to manual mode. Click anywhere outside the boxes once you're done selecting the 3 spectrum settings for this Program.

Next you must set the On Time which is the time you want the lights to turn on, and then the off time. First click the HRs (left box) then MINs (right box.) next to "ON AT" to set the ON time using the + - buttons at the bottom. Next repeat in the 2 boxes next to "OFF AT" to set the OFF time. (NOTE: all times are in 24 hour military format) Once finished you should see the total hours of ON time each day listed below the "Total On" label.

Finally, if you wish to use the Sunrise/Sunset feature, click on the box to the right of the "Total On" indication (showing 30 on the screen shot above.) This is the total time in minutes that it will take the lights to gently ramp up beginning at the ON time, and then gently ramp down to the OFF time. Once you're done click SAVE.

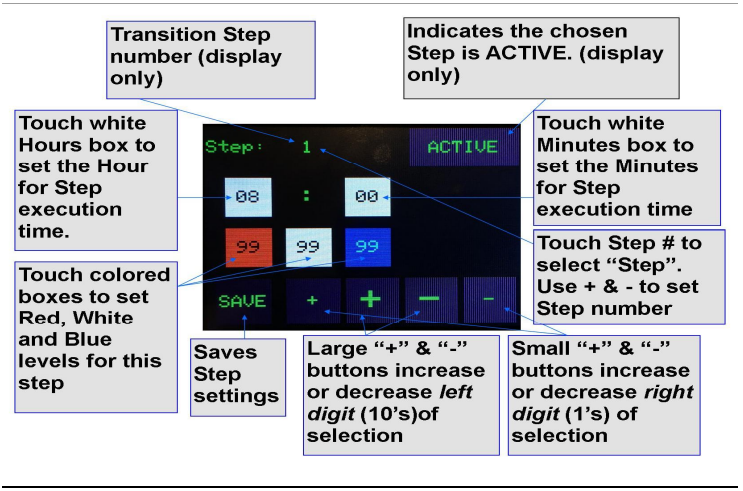
This will take you back to the EDIT PROGRAMS page (see above). Make sure the Program that you just edited shows ACTIVE on the top right corner. If not, touch it until it reads ACTIVE. Now touch the BACK button twice and you're done! This program will now repeat every 24 hours, indefinitely, if NO CALENDAR functions are enabled. See the next section: Multi-day/week spectrum programming for how to program multiple Programs (grow phases) to run through an entire multi-week grow.

ADVANCED PROGRAMMING

The Controller can be programmed for multiple spectrum transitions during a single 24 hour period to simulate the changes that plants see with the Sun from the early bluish morning light to late afternoon deep red. Up to 20 transitions (Steps) can be programmed within a single ON period. To enable advance programming:

At the *HOME SCREEN* Touch SETUP, then touch EDIT PROGRAMS, then touch EDIT STEPS to get to the EDIT STEPS Page (see above.) Touch ADVANCED.

-ADVANCED PAGE-



You will now see the *ADVANCED* page with Step 1 at the upper left corner. PLEASE NOTE: When using the Simple Edit steps programming for creating the simple ON/OFF programming described previously, the Controller has effectively created an ON step #1, and an OFF step #20 FOR you in the advanced programming section. To scroll through steps touch anywhere (neutral area) on the screen that not a button, then touch the +- keys to scroll through the steps from 1 to 20.

So Step #1 will be the ON step with the first spectrum mix to be used. It must be set to ACTIVE. Now press the small + button to advance to Step: 2. Set the HOURS and MINUTES boxes to the time the transition should execute. Then set the three Red/White/Blue spectrum boxes to the desired spectrum mix.

Finally, touch the red "INACTIVE" button until it reads green "ACTIVE". Touch anywhere on the screen again and then the small + button to advance to Step: 3. Continue in this fashion for as many steps as desired to the maximum of 19 excluding the final OFF Step #20. Remember, each step MUST be set to ACTIVE for it to execute in the sequence. If a step is left inactive, the previous step will simply continue until the next ACTIVE step time, or the final OFF step #20.

REMEMBER: The ON time is always Step #1, the OFF time is ALWAYS Step #20 regardless if you program steps in between.

3.8 Multi-Day/Week/Season Schedules

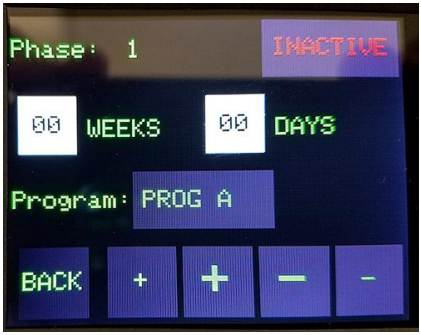
Once you have set up multiple 24 hour Programs as explained in section 3.7 you can now Schedule these to run on consecutive days or weeks throughout an entire growth cycle. It is possible to schedule up to 10 different Programs (growth phases) over the a grow cycle of up to a maximum of 24 weeks.

A sample calendar program example might be to run a "Veg" Program 1 with a spectrum B99 W99 Red60 set for 18 hours/day ON for 6 weeks, then transition to a "Pre-Flower" Program 2 with more B99 W99 R80 set at 12 hours ON per day for 2 weeks, then a "Flower" Program 3 with B60 W99 R99 for 4 weeks, then finally "Ripen" Program 4 with B99 W99 R70 to harvest. ALL this can all be set up automatically – both for the spectrum settings and length of day in each multi-week phase.

To program the Calendar from the home screen touch SETUP. On the *SETUP Screen* touch SET CALENDAR. *NOTE: You will want to have ALL the necessary grow phase Programs already programmed and SAVED before you begin to setup the CALENDAR*.

The current WEEK and DAY are displayed. For a new program you would start with Week 1, Day 1 and start building your schedule. If the calendar shows something other than Week1/Day1 you can use the RESET button to set it back to 1/1. But if you are coming in the middle of a Cycle, this can be set here using the + - buttons. The current WEEK and DAY are displayed. For a new Cycle you would start with Week 1, Day 1 and start building your Routines.

Next, touch SET ROUTINE.



This will allow you to schedule Phase 1 – the first routine in your grow cycle. Next select the program you want from the 24-hour program you have already set up. Touch the Program listed and it will give you the list of all current programs that have been set up. Select the program that you would like to run for the first phase of you grow cycle. Enter the number of weeks and days you would like this phase to run. Click on ACTIVE to save and start the program. To set the next phase, touch the small plus sign. This will advance to Phase 2. Once again touch Program to select the program you want to run for Phase 2. Touch ACTIVE to save the phase and make it active and ready to run. Continue this process until you have scheduled all the desired Phases in the schedule. Touch BACK to return to the SET ROUTINE screen. Touch SAVE and then BACK to return to the HOME screen. Your schedule will now be displayed on the HOME screen. It will tell you the name of the current program running, the spectrum settings, the time ON and time OFF. It will also tell you the current WEEK and DAY in the grow phase.

3.9 Using Programs with External Contactor and Time Clock

When the SolarSystem is used with lighting Contactor controlled by an External Clock, it can still provide all its features except for ON/Off scheduling with a few programming changes:

All programmed dimming or spectrum transitions that change throughout a scheduled lighting period, must be programmed with a “Buffer Period”, such that any programmed Transitions should start *at least 5 minutes or more* after the Contactors scheduled ON time. No clock is perfectly accurate, so the buffer period is to allow for any inconstancies between the external time-clock settings of the Contactor and the SolarSystem Controller clock. Care must be taken to ensure that the two clocks (contactor clock and SolarSystem Controller clock) are always close (within the buffer period) in their time setting. Periodic adjustments may be necessary.

So, to set a “Buffer Period” if for example, the Contactor is set for on time of 08:00 and off at 20:00, the SolarSystem Controller would have all programming steps start after 08:05 (or later) and end before 19:55 (or earlier) to insure power is always applied to the SolarSystem lights when ALL control commands are to be received from the SolarSystem Controller. See the “Programming the SolarSystem” section for more details on programming Transitions.

4.0 Warranty and Service

California LightWorks (CLW) warrants its products are free from defects in material and workmanship. Subject to the conditions and limitations set forth below, CLW will, at its option, either repair, replace or give a refund for any product that prove defective by reason of improper workmanship or materials. Repaired or replacement products will be provided by CLW on an exchange basis, and will be either new or refurbished to be functionally equivalent to new. Any refunds given will be at the current value of the product at the time the warranty claim is made. This limited warranty does not cover any damage to this product that results from improper installation, accident, abuse, misuse, natural disaster, insufficient or excessive electrical supply, abnormal mechanical or environmental conditions, or any unauthorized disassembly, repair, or modification. This limited warranty also does not apply to any product on which the original identification information has been altered, obliterated or removed, has not been handled or packaged correctly or has been sold as second-hand. This limited warranty covers only repair, replacement or refund for defective CLW products, as provided above. CLW is not liable for, and does not cover under warranty, any loss of data or any costs associated with determining the source of system problems or removing, servicing or installing CLW products. This warranty excludes 3rd party software, connected equipment or stored data. In the event of a claim, CLW's sole obligation shall be replacement of the hardware.

Terms

The following CLW products are covered by this warranty for a period of five years from the date of purchase: SS550, SS1100, SS275. All other products including the SolarSystem Controller are covered by this warranty for a period of one year from the date of purchase.

Disclaimers

The foregoing is the complete warranty for CLW products and supersedes all other warranties and representations, whether oral or written. Except as expressly set forth above, no other warranties are made with respect to CLW products and CLW expressly disclaims all warranties not stated herein, including, to the extent permitted by applicable law, any warranty that may exist under national, state, provincial or local law including but not limited to any implied warranty of non-infringement, merchantability or fitness for a particular purpose. All warranties, whether express or implied, are limited to the periods of time set forth above.

CLW's total liability under this or any other warranty, express or implied, is limited to repair, replacement or refund. Repair, replacement or refunds are the sole and exclusive remedies for breach of warranty or any other legal theory. To the fullest extent permitted by applicable law, CLW shall not be liable to the purchaser or end user customer of a CLW product for any damages, expenses, lost data, lost revenues, lost savings, lost profits, or any other incidental or consequential damages arising from the purchase, use or inability to use the CLW product, even if CLW has been advised of the possibility of such damages.

Service Procedure

CLW is the only authorized provider of warranty service. Any attempt to service these products by customers will void the warranty. For Service please contact:
Email: support@californialightworks.com
Phone: 800-575-3475 x 300
Address: California LightWorks
Attn: Warranty Repairs
7949 Deering Ave
Canoga Park, CA 91304