What is Checkerboard Control and why you should consider this method of lighting for your plants.

One of the hard and fast rules for providing your plants with artificial plant lighting is that they need a lot of light. And providing that light to your plants is expensive in terms of the kW per hour costs associated with getting that light to your plant canopy. So from time to time we really should ask ourselves if we are doing everything within our power, with all the evolving technologies, to give our plants what they need without overdoing it simply because we have gotten comfortable with a 'this is the way we've always done it' mentality in our grow room designs.

In the interest of considering another way of delivering light to our plants let's consider that plant leaves are very much like solar panels in that they capture photons that happen to strike them. Of the many photons that a light produces the vast majority of them will go on to hit surfaces that are not fan leaf chloroplast receptors. As plant lighting engineers we know this and have worked on designs that work to not only aim these photons more precisely towards our canopy surfaces but will serve to increase the photons value by providing plant friendly spectrums and increased intensities that mimic the best outdoor conditions with the aim to produce higher quality and higher yields in our indoor grow rooms.

With all that being said it's time to consider what we as plant lighting engineers might do to take a page out of the outdoor solar environment and bring it into our indoor gardens to mimic the irregular nature that sunlight hits our plants when considering the changes brought on by cloud cover and how plants react to those changing conditions when their whole purpose in life is to utilize the available environmental conditions to create the best flowers that plant can offer. This effect in plants is known as The Emerson Effect and you can learn more about it @ https://en.wikipedia.org/wiki/Emerson_effect.

When a plant is lit indoors the variation in light intensity does not, or at least by current design theory is not supposed to, vary over the course of the photoperiod as a way to meet the plants Daily Lighting Integral or DLI for short. This DLI value is given as a Moles/Day value that is specific for each plant species and is dependent upon what part of the planet it happens to grow in. But in nature, with passing clouds and the suns orientation to the plant changing throughout the day it would appear that there may be actual benefits in setting up lighting controls for our indoor gardens that mimic these conditions, to the extent that we can to not only reduce power consumption but force the plant to do more with the photons they do accumulate as the excitation state of the plant is changed during its lights on photoperiod. So how can we do this?

One method that has been used for many years is the use of Light Rails that move the lights over a larger area than the single fixture was designed to cover. While expanding the actual grow area it also creates a heightening and lowering of the crop intensity which has shown to be beneficial to the plants experiencing these non-linear illumination levels.

Another method that has been used with High Pressure Sodium lights has been a line voltage switching off then back on of every other light on 2 hour cycles. It's been referred to as a Checker Board Control that creates a bleed over effect of light that travels from the lit fixtures to the unlit areas but the constant (6X per 12 hour shift) of turning these lamps on and off does create premature wear on the lamps resulting in premature failure. It also takes a lot of work and money to set a room up to handle switching this way and once done it's prone to switching failure if the controls give out. Consequently it's not a popular control approach especially for HID lit grow room applications. But it's different when the lights you're growing with are wirelessly controlled and infinitely manageable based on how you set the switching parameters up with your programmable controller.

We don't need a crystal ball to foresee that the price of power will go up, commercially produced cannabis prices will fall and greenhouse gas emissions will no doubt be a factor in how much power a business is able to consume, based on the industry they happen to be in without there being serious financial implications having exceeded those emissions. So it is with all these things in mind we developed the Impact Series LED Grow Lights to first and foremost deliver the quality and yields that growers expect from higher wattage HPS systems but to be perfectly tailorable to lighting control strategies such as the Checkerboard Control as a way to maintain crop production values but decrease consumed power by as much as 50% when not using these control strategies.

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What we created with our Impact Series LED Grow Light is a tool that lets our 151 Lighting Controller allow the grower to decide if he wants to alternate the lights every 5 minutes or every hour or even more. Once the grower decides the cycle period the grower gets to decide if he wants the A light running @ 100% and the adjacent B light at 50% or 60% reduction from the A light value. These values are completely programmable based on what you want to experiment with on your specific genetics. And the value here is that we don't have hard and fast numbers on an across the board schedule for these controls. We're going to get that feedback from growers willing to share it. It may be that you only want to reduce the range by 20% for a high value crop. But the next grower with the same genetics reduces the range by 60% and sees a similar yield but it took them less money to get to that harvest this is worth noting.

This is a sample 12/12 Flower Room Checkerboard Control schedule utilizing Impact Series LED Grow Lights with a 151 Lighting Controller that flips the lights output every 30 minutes for a total of 24 cycles in a 12 hour photoperiod.

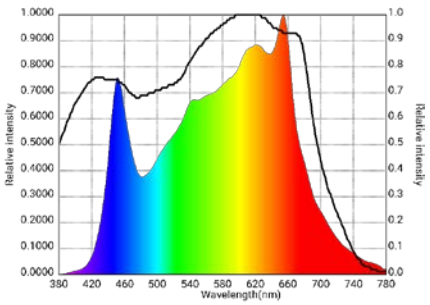
First Cycle

Light A: 100%		Light B: 50%		Light A: 100%		Light B: 50%		Light A: 100%		Light B: 50%
Light B: 50%		Light A: 100%		Light B: 50%		Light A: 100%		Light B: 50%		Light A: 100%
Light A: 100%		Light B: 50%		Light A: 100%		Light B: 50%		Light A: 100%		Light B: 50%

Second Cycle

Light A: 50%		Light B: 100%		Light A: 50%		Light B: 100%		Light A: 50%		Light B: 100%
Light B: 100%		Light A: 50%		Light B: 100%		Light A: 50%		Light B: 100%		Light A: 50%
Light A: 50%		Light B: 100%		Light A: 50%		Light B: 100%		Light A: 50%		Light B: 100%

Spectral Distribution Graph
Impact Series Model 151-740
Flowering High Mode Setting
Referenced against the
McCree Plant Action Curve



Type Luminaire:	LED Sine Wave Grow Light
Model:	Impact Series
Model No:	151-740
Wattage:	*High Flower (740) Low Flower (380) High Veg (440) Low Veg (200)
PPF:	1750 µMol/sec @ High Flower Setting
Voltage:	100-277 v AC 60Hz
Dimensions:	W 26.5 (67cm) x L 44 .5 (113 cm) x H 5.5 (16.5 cm)
Weight:	33 lbs (15mg)

** All the values shown here are fixed when operated in analog mode. When the 151 Digital Programable Controller is used the client has, among other features, virtually full range dimming capabilities in both the vegetative and flowering modes.*

With lower wattages, lower temperatures and a more natural sunlight spectrum isn't it time your grow lights positively **IMPACT** the Environment, **IMPACT** Your Plants and **IMPACT** Your Bottom Line.

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