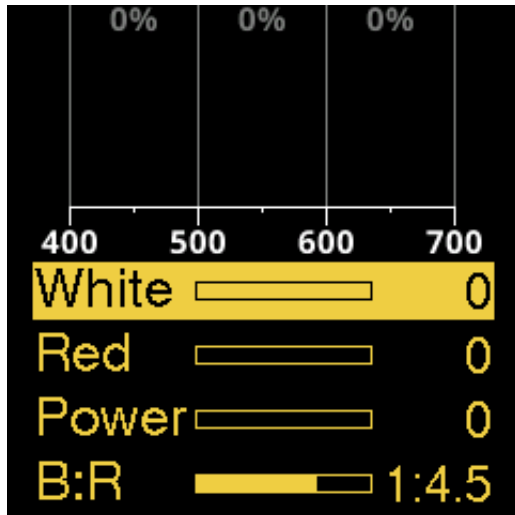


Manual Growing Program



In this program, four additional sliders appear at the top of the menu. Two sliders allow for individual control of the White and Red channels, while the other sliders allow for the more natural control method of power and B:R ratio.

The slider on the Status Screen slider works identically to the Power slider. When using the slider on the Status Screen, the initial B:R ratio is equal to the maximum B:R ratio of the fixture model (☒ See Appendix A), usually 1:4.5 or 1:4. If the B:R ratio was changed in the menu, the fixture will attempt to keep the same ratio when the changing the power from the Status Screen. (Some caveats apply, described below.)

Individual control

The two channels of the fixture are controlled independently. The sliders are named:

- **White**
- **Red**

Adjusting White and Red channels individually gives you the most control over the fixture. When increasing from 0%, it jumps to 5% first. Depending on the configured display unit (see above) it may show other values, but it is still a 5% step. This is a limitation of the LED drivers, which cannot be used between 0% and 5%. Attempting to set a channel below 5% turns that driver off. While adjusting the Red channel high and White channel low, the B:R slider may both display an out-of-range value ("1:--"). This is only the way it's displayed and does not affect the real output. However,

Power and ratio control

when switching to power/ratio control, the B:R ratio will forcefully be constrained to the manual range (1:1 to 1:6).

The output will be computed based on preferred power and B:R ratio sliders. The sliders are named:

- **Power** (works identically to the slider on the Status Screen)
- **B:R**

Controlling the output using the Power and B:R Ratio controls is often the most natural way of thinking about what a plant needs at any stage in it's life.

Power controls the White and Red channels simultaneously, while trying to keep the B:R ratio at the same value (rounded to 1 decimal).

By definition, the Power is the maximum between the White and Red channels, when expressed in percentage. This guarantees that when power = 100%, at least one of the channels is 100%. Which one depends on the B:R ratio. When Power is 100%, this does not mean 100% of the rated power of the fixture is used. That only happens when both the White and Red channels are at 100%.

⚠ Caveats: When decrementing the power below circa 40%, the Red channel will approach 5% where the B:R cannot be maintained anymore. ☒ For exact values, see [Appendix C](#).

B:R controls the ratio between the red and blue channels, expressed in the ratio between light in the ranges 400–500nm (blue) and 600–700nm (red). The

ratio can be varied between 1:1 and 1:6 in steps of 0.1. When adjusting the B:R ratio, it will try to keep the Power control at the same value.

The White channel by itself has a B:R ratio of 1:1 (it emits as many blue photons as red). The ratio will not exactly be 1:1 when you check the measurements with a spectrophotometer, but it will be close enough for most purposes. The Red channel by definition has a ratio of 0:1, or 1:∞.

The ratio is also displayed in the spectrum if the option "Show chart %" is not turned off. Because of space limitation, any ratio over 1:10 will be displayed as 1:--, both in the chart and at the B:R setting.

The ranges of 500–600nm (green/yellow) and 700–750nm (Far-red/NIR) are not used in any calculation.

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