

## **Supplemental Information – LED Fixtures**

Three (3) LED tiles per tier are provided which contain dimmable LEDs capable of producing *up to 405  $\mu\text{mol}/\text{m}^2/\text{sec}$  at 6" / 15 cm from the fixture at 25°C*. A two-channel combination of white SciWhite® and infrared PetriClear™ LEDs are included.

***Please Note:*** *The infrared PetriClear™ LEDs are not visible, so will not visually appear to be “on” when the chamber is illuminated.*

*Temperatures above 40° C may significantly dim the LEDs. It is recommended that you verify the light intensity using an independent sensor.*

### **Dimmable Lighting Process:**

LED dimming is accomplished in an “open loop” configuration, where set points are entered into the Intellus controller as percentages and the controller scales its output voltage to the LED control modules to correspond with the set point.

### **Intellus Display and Setup:**

The lighting outputs are set up on the Intellus controller as follows:

- Light 1 controls the white and infrared LEDs on all tiers.

When running manual settings, LED lighting levels are input as percentages, and are set on the Intellus Controller in the Lights menu. To enter the Lights menu so that the lighting set points can be changed, press the **LIGHTS** key on the Intellus Controller. Use the arrow keys to navigate through the menu and select the desired light output (the number of available outputs will vary according to the type of chamber and options ordered). To change a light setting, press the **ENTER** key and use the arrow keys as necessary to change the setting. Press the **ENTER** key a second time to accept the changed setting. To exit the Lights Menu and return to the Main menu, press the **LIGHTS** key.

Lighting levels can be programmed using the programming features of the Intellus controller. For more information on using the Intellus controller to program the lighting levels, please refer to the attached *Intellus Controller Manual*.

**NOTE: Running the chamber in Diurnal mode will cause all LED modules to energize at full intensity. Conversely, during the night cycle in Diurnal mode, all light outputs will be de-energized. Only the Manual and Program modes are conducive to the intermediate light intensities available through the dimming option.**

On the main display screen, the lighting level for each dimmable lighting output will be displayed as a bar corresponding to the lighting set point (percentage).

Example: A chamber with two dimmable light outputs with settings of 75% and 50% will show two bars in the light outputs portion of the main display, with the first bar 75% full and the second bar half full.

### **Service and Maintenance:**

#### **LED modules not working:**

- ✓ **Power plugs:** Check to ensure that the power plugs for the fixture are securely installed in their receptacles.
- ✓ Refer to the electrical diagram provided in the *Associated Diagrams, Schematics, and Miscellaneous Information* section of this manual. Check the DC power supplies for the LED modules. A green LED illuminates on each power supply when the LED modules are programmed on. Each power supply is powered with 115V power and output a signal of 24VDC between each V+ and V- terminal.
- ✓ If other troubleshooting steps do not correct the issue, replace LED interface board.

#### **Individual LED module not working:**

- ✓ Replace module with a known working module. If the known working module does not work, check wiring from fixture receptacle to LED module located inside fixture.

### **Supplemental Information – Condensation Avoidance**

The chamber has been designed with a higher light intensity than necessary for plant tissue culture to provide maximal utility for user experiments. Running it at this higher intensity can cause heavy condensation on the inside of petri dishes. To avoid this, run the chamber at a light intensity no higher than  $150\mu\text{mol}/\text{m}^2/\text{s}$  (center of the shelf measurement with the door closed) at 15 cm. Stacked petri dishes may have different results. It is advisable to calibrate your lights-on offset to this lower intensity and allow at least 4 hours after a light change for conditions to settle.

If you are still experiencing condensation, some further guidelines include:

- using a multi-step program in ramping mode to smooth out abrupt changes
- conducting analysis during the night period immediately before the day period
- recalibrating temperature offsets
- insulating the bottom of the dishes
- conditioning dishes and their lids to the same temperature as the chamber before closing lids

## **Supplemental Information - Connect Tubing to Unit Cooler Drain Line**

The unit cooler drain line exits out the rear wall of the chamber. Connect the supplied white plastic tubing to this drain line and direct to an appropriate drain or drain pan.

