

Lighting Glossary

A3 Product

Highly-efficient, high-performing, horticulture LED light fixture that efficiently removes heat from inside the room. A3 is comprising of an aluminum housing, copper water-circulation system, and 3 built-in LED light modules. (No distinction is made for DD variant)

Light

Electrical and computer subsystem within A3 housing, comprising LED Modules (3x), Light Control Board, Light Network Board, and Light Computer. When clear from context, these are also referred to as Control Board, Network Board, and Pi.

LED Module

A group of LEDs and support electronics that is in the unit at which on/off and light intensity can be controlled.

Light Control Board

Power supply and Light Control Processor that controls LED Modules and communicates with Light Computer

Light Control Processor

The Microchip digital signal processor that resides on the Light Control Board and manipulates the LED drivers

Light Network Board

Onboard 5-port Ethernet switch and bridge between Light Control Board and Light Computer interfaces

Light Computer

Raspberry Pi 3 single-board computer that offers REST APIs to control LED Modules and query status. Pushes sensor readings and status information to collector(s).

Server

Computer that stores a local copy of Room and Light configurations and schedules. Controls Light on/off/dim values according to active schedule.

HMI (Human Machine Interface)

Agnetix dashboard that delivers visibility into a grow room's health, providing growers with critical environmental and plant data. HMI screen is preferably close to physical room. (May or may not be same physical computer as HMI Server, Room Server or Backup Server.)

X900

Assembly details and drawings along with BOM (Bill of Materials)

X910

BOD (Basis of Design)
① Room/Zone Plan View
② Room/Zone Section

X920	Facility or Building Floor Plan
X930	Site Plan or Campus MAP
Backup Server	A cloud-based computer server is recommended - if on-site backup also needed, it is not the same physical computer as primary Server --- to store a backup, local copy of Room and Light configurations and schedules. Temporarily becomes active Server if primary server is temporarily down.
Simulated Light	A Light Computer that is exactly identical to the one within a Light, except that its serial interface connects to an Arduino or similar COTS board that merely simulates the operation of a Light Control Board and LED Modules by way of onboard or breadboard-connected LEDs, for example
Camera	A downward facing camera which plugs into USB port and provides the grower a full view of the plant canopy.
IR Camera	A downward facing camera which plugs into USB port and provides the grower a full heat view of the plant canopy (may be averaged and used as control point).
NIR Camera	A downward facing camera which plugs into USB port and provides the grower a full leaf water content view of the plant canopy (may be averaged and used as control point).
Finite Spectral Analysis Camera	A downward facing camera which plugs into USB port and provides the grower a full view of each compound being produced over the entire plant canopy (may be averaged and used as control point)
USB Environmental Sensor	Any Temp, RH, windspeed, CO2, light, or IR sensor plugged into a standard USB port
Ethernet Sensor or Ethernet Camera	Intra- or Inter- net sensors or cameras outside the Agnetix system that can plug into standard Ethernet port.
Heat Recovery/Water Loop/Liquid Cooled	Simple water loop that run water from a water storage vessel into the A3 copper pipes and removes heat energy from the fixture, returning it to the water storage vessel. The rejected heat removes heat from room for a more stable environment. The rejected heat can then be re-used back into the facility in several forms including hot water, hot air or floor heaters.

Leaf Surface Temperature

The temperature of a plant's leaf, is determined by a variety of factors including plant type, light spectrum used and air temperature. Ideal leaf temp for healthy photosynthesis is between 15-30 degrees Celsius (59-86 degree Fahrenheit).

PPFD (PHOTOSYNTHETIC PHOTON FLUX DENSITY)

PPFD is a measure of the number of photons in the 400-700nm range of a plant's visible light spectrum (Photosynthetic Active Radiation or PAR) that fall on a square meter of target area per second. Unit of measure: $\mu\text{Mol}/\text{M}^2\text{S}$

PPF (PHOTOSYNTHETIC PHOTON FLUX)

PPF is a measure of the number of photons manufactured by a lamp per second. Units of measure: $\mu\text{Mol}/\text{S}$

UMOL/J

This is a measure of how efficient a horticulture lighting system is at converting electrical energy into photons of PAR. Using PPF of the light along with the input wattage, you can calculate the efficiency of a horticulture lighting system at converting electrical energy into PAR. Unit of Measure: $\mu\text{mol}/\text{J}$. Higher $\mu\text{mol}/\text{J}$ signify an efficient lighting system for converting electrical energy into photons of PAR.

Full Spectrum

Full-spectrum light is light that covers the electromagnetic spectrum from infrared to near-ultraviolet, or all wavelengths that are useful to plant or animal life; Sunlight is considered full spectrum.

PAR (PHOTOSYNTHETIC ACTIVE RADIATION)

Photosynthetically active radiation, often abbreviated PAR, designates the spectral range/distribution (wave band) of solar radiation from 400 to 700 nanometers that photosynthetic organisms are able to use in the process of photosynthesis.

Photosynthesis

The process by which green plants and some other organisms use sunlight to synthesize foods from carbon dioxide and water. Photosynthesis in plants generally involves the green pigment chlorophyll and generates oxygen as a byproduct.

Transpiration

The exhalation of water vapor through the stomata of a plant

HERO (HIGH EFFICIENCY RED ONLY)

HERO is the product name for the Red LED Only version of the Agnetix A3. This fixture uses only 660nm LED to deliver 4000PPF and is primarily suited as supplemental light in greenhouses.
