

Daily Light Integral Control Program

This control application is used specifically for managing and standardizing the total daily light delivered to greenhouse crops.

It measures and calculates the Daily Light Integral (DLI) at the crop level, using a new algorithm to predict the available natural light as the basis for supplementary lighting control.

This program delivers standard DLI despite daily and seasonal weather variations and ensuring optimal use of electrical energy and lamp resources.



Applications

Despite many advances in greenhouse designs and equipment, light is at best a partially controlled variable for most greenhouse horticulture applications.

Although photons provide the basic energy units that drive all plant growth processes, we are still at the mercy of the sun and seasonal weather patterns.

Even with the addition of supplementary lighting and shading systems, it is difficult to provide an exact amount of daily light given the unpredictability of weather and the seasonal fluxes in solar radiation reaching the crop.

Traditional supplementary lighting strategies have focused on photoperiod extension and maintaining minimum light intensities. While these types of lighting strategies are useful, they are not an effective way to provide a uniform amount of daily light.



Features

- **Reducing Energy Costs-** Reducing your energy costs depends on whether you were previously under or over lighting with respect to the DLI target for your crop. DLI control is a different way of measuring and proportioning the amount of light that plants receive.
- **Improving Crop Yields** – Control over the growth cycle can lead to larger crop yields and better results.
- **Predictable Results** – Researchers have established minimum DLI levels for several commercial crops. If light levels fall below these amounts, sub-optimal growth and production can occur. DLI allows you very predictable crop results.
- **Better Quality** – Using DLI improves consistency with better control over greenhouse light and manages the daily amount of light leading to a stable quality in your plants.
- **Improved Timing** – Controlling DLI can lead to faster, better results to help reduce your research or growth cycle.

Operation

The **DLI** control program is used to regulate the **Photosynthetically Active Radiation (PAR)** spectral range of solar radiation. It predicts exact amounts of daily light required to enhance growth rates and save energy for systems using supplementary lights.

The **Argus DLI Control Program** begins with a target DLI and a predicted maximum DLI from sunlight based on the time of year, the location, and the light transmission efficiency of the greenhouse.

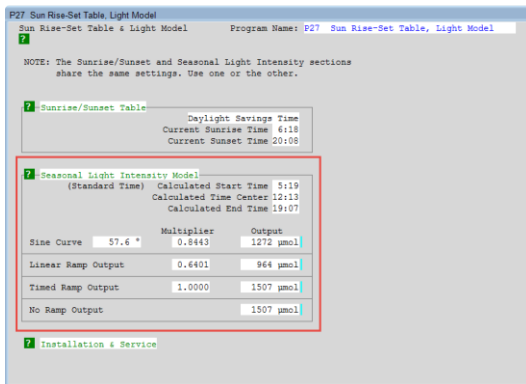
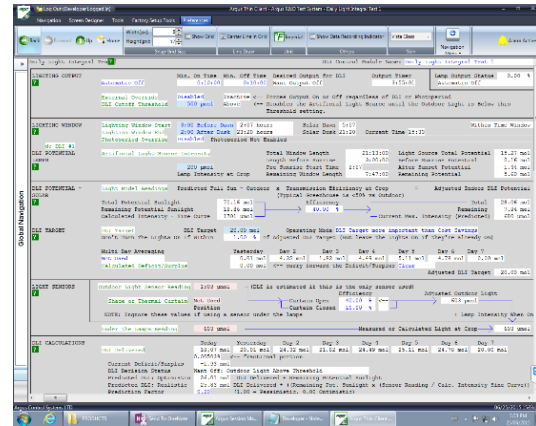
Rather than rely on weather forecasts or external connections to forecast data, the program is fully self-contained. It calculates the potential available DLI from a **Seasonal Light Intensity Model** running natively on the Argus system.

This model calculates the dawn to dusk solar intensities for each day based on the predicted weekly maximum PAR intensity values at midday for your location and time of year.

The DLI program updates its predictive calculations throughout the day by comparing the actual light received by the crop to the potential light (the amount of sunlight potentially available on a clear sunny day).

Surplus light can be forwarded into the next day's calculations to produce an accurate multi-day average DLI even when there are some variations between days.

Supplementary lights are only operated when the program determines there is a high probability that the DLI Target cannot be achieved using the remaining sunlight potential.



In this way, it is possible to deliver an accurate, repeatable DLI while using as little purchased energy and lamp operating hours as possible.

To further increase overall accuracy and reduce energy use, the program can optionally compensate for any daily deviations between the actual DLI delivered and the DLI Target by carrying forward a rolling average for up to 7 days.

Additional Information

For more information, please contact Argus Support.

