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ARGUS ADVISOR

News for Argus Control System Owners

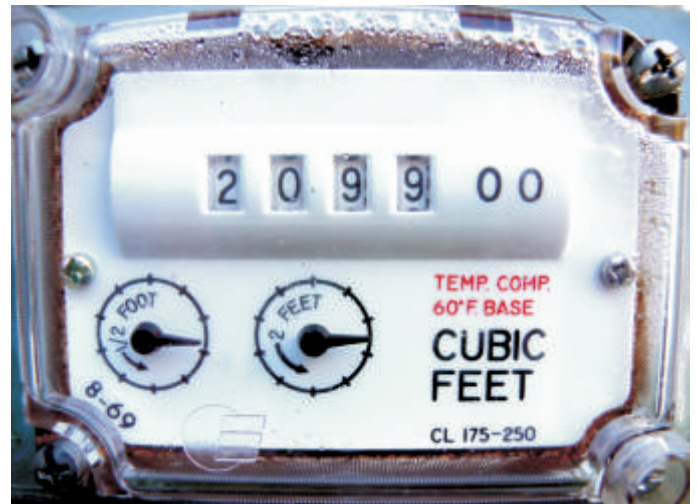
This is a good time of year to stop and reflect on past performance and future possibilities. Once again we return to the topic of energy saving as it is such an important part of the greenhouse industry, and never more topical than it is now. When considering energy saving measures, also consider the impact on crop quality and yield, as this is where your money is made.

We are continuing to roll out new applications for Titan systems. Recently we have released a new nutrient control application (see page 4) and we will soon be releasing an evapotranspiration modeling add-on for outdoor irrigation decisions. It is based on the Penman-Monteith equations which are the recommended standard of the UN FAO (Food and Agriculture Organization).

On a separate note, Our spring Newsletter contained an error in the light units conversion table. See our website for the corrected table information and further light unit conversion caveats.

Alec Mackenzie

Argus Energy Management Features



Past issues of the Argus Advisor have dealt with some general strategies and choices for reducing heating and cooling costs. This issue reviews some of the more specific features of your Argus system that are used to manage and monitor energy use.

For most greenhouse growers energy is the fastest growing cost of production. Therefore, it makes sense to manage your expensive energy inputs wisely. Besides the obvious benefits, with increasing concerns over global climate change, most of us want our customers to have confidence that we are doing our part to reduce our fossil fuel use and carbon dioxide emissions.

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Take Control With Argus

Argus can save energy for you in many ways. Here are some examples:

Diurnal Setpoint Schedules

Setpoint schedules can be created based on the solar dawn and dusk times with appropriate offsets entered in by the Argus User. Setpoints based on solar dawn/dusk times allow the greenhouse to take advantage of the solar gains by:

1. Delaying temperature setpoint increases in the morning to allow for natural solar gains.
2. Allowing the climate temperature to rise late in the day to effectively capture some solar gains going into the night period.

Heating Limits for Dehumidification

This restricts the relative amount of heating resources used for dehumidification. It is particularly useful when mild, humid outdoor conditions would otherwise result in excessive use of heating resources.

Ventilation Limits for Dehumidification

You can restrict the amount of ventilation for dehumidification purposes to reduce the subsequent need for reheating the exchanged air.

Separate Diurnal Setpoints for Heating and Ventilation Control

These settings allow you to set a variable 'dead band' between heating control actions and ventilation control actions. Generally speaking, the wider the band, the more energy you can save, particularly in moderate weather.

Predictive Feed Forward Energy Balance Calculations

These tuning settings are used to compensate for changes in outdoor temperatures and light levels before they can produce an error in the climate conditions. Light levels provide an indication of solar gain potential for proportioning control responses. Outdoor temperature differentials provide an indication of relative energy losses. The control system automatically compensates for these losses as well as calculating the relative cooling effect of any ventilation air exchange.

Regulated Zone Pipe Temperature Control

Pipe temperature control helps ensure the amount of heat energy applied to a zone closely matches heating requirements.

Heating System Request Temperatures

Heat requests allow for efficient and sequential staging of central and distributed heating equipment so that only the resources required to meet the current heat demand are utilized.

Modulating Vent Control

This ensures that the vent position closely matches ventilation/cooling requirements. Proportioning and compensation settings for wind direction and shade curtain positions further increase ventilation accuracy.

Curtain Control

Separate curtain system mode settings allow you to use your curtain system for maximizing heat retention at night and minimizing excessive solar gains during the day.

HAF Fan Control

Minimizes electrical and heat energy waste by restricting the use of HAF fans to times when they are most needed (vents closed, humidity high, etc.)

Supplemental Lighting Control

Minimizes electrical consumption and maximizes lamp and fixture life by using supplemental lighting only at times when solar light levels are insufficient. Other energy saving features include an automatic shutdown option when a minimum amount of daily solar radiation has been achieved.

Integrated Heat Buffering and Storage Capabilities

Used wherever surplus hot water heat can be accumulated and stored for later use. A common example is storing and managing the heat produced from daytime extraction of CO₂ from flue gas for later use. Another might be the storage of low cost biomass-derived heat for later use.

Multi Fan Control

Provides intelligent staging and rotation of multiple exhaust fan installations to optimize climate uniformity and minimize electrical usage.

Climate Averaging Strategies (Argus SmartHeat)

This advanced climate management feature can be used for better crop scheduling of date sensitive crops and for minimizing the use of purchased energy by taking into account any cumulative growth gains made on sunny days.



The Importance of Monitoring and Data Recording

To get the most from your control system it is important to understand how your greenhouse and its associated equipment works and responds to changing outdoor conditions. One of the most important and often under-used features of your Argus system is its monitoring and data recording capability. Use it to monitor all aspects of energy management including changes in equipment on/off cycles, total operating hours, and average pipe temperatures. When plotted and compared on graphs this information can provide an excellent indication of relative energy use over time. Sudden unexplained changes can also indicate potential problems with equipment or settings.

Investing in Energy Management

As the cost of energy rises you may need to do more than just manage it efficiently. You may need to consider investments in equipment and other alternatives that will improve the overall energy efficiency of your operation. Your Argus system can also be configured for highly specific energy management strategies such as boiler staging and rotation, geothermal heat exchange, and operation of cogeneration equipment.

If you are considering options for improved energy management, feel free to give us a call so we can discuss the best ways of automating and integrating these solutions.



The more you understand (and the Argus system can help you to learn) the better you can direct your operations and make informed decisions about energy saving equipment. You may also wish to have Argus provide an energy audit service where we will review your system configuration and monitor your equipment performance for peak efficiency.



New Nutrient Injection Software

Argus has developed a new nutrient injection control application for Titan systems. It is now in early beta release. The new programs feature full recipe management and automatic dosing from up to 14 concentrate tanks. Anything from A/B injection to full 'single element dosing' is supported. You can even enter your fertilizer formulas in elemental parts per million and the program will automatically calculate and create the recipes on-the-fly from available stock concentrates. This enables you to use one injection system to produce many different feed formulas from the same raw ingredients. Once you have developed a recipe you can request it from any watering decision.

This new nutrient injection software is designed to compliment the capabilities of Argus **Multi-Feed** injection systems. It is also compatible with other multi-head injection equipment. Look for more information in upcoming issues of the Argus Advisor.

New Argus A/B Injector

Argus has developed a new line of A/B nutrient injectors as part of its series of Multi-Feed injection equipment. Features include simple reliable components, good overall accuracy, and high turn-down ratios (limited only by the water meter selected). In-line or tank and batching applications are all supported with one injector model.

The components include dual venturi proportioning control with integrated EC, temperature, and pressure/flow monitoring. Other options such as pH monitoring and control are also available. These injectors are available for all Argus systems and can be sized for design flow rates ranging from a few gallons to thousands of gallons per minute.



Argus A/B Nutrient Injector

See us at the Horti Fair

Argus will be an exhibitor at the 2007 International Horti Fair October 9-12, booth 05.0406. This annual event is held at the Amsterdam RAI in the Netherlands and attracts nearly 50,000 professionals from around the world and over 1000 participating companies. This year's theme is a **Focus on Water and Energy**.

For more information, visit www.hortifair.com