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## ARGUS ADVISOR

News for Argus Control System Owners

Despite a challenging economic climate, our new Argus Titan system continues to prove a success in both the marketplace and in the many new and novel installations that we have completed since its introduction.

Although we are naturally pleased with the performance of the Titan system on complex and high profile projects, we want to stress that Titan is not just for high end applications. It is equally suited to providing the reliable control in mainstream greenhouse and outdoor irrigation applications that you should expect from Argus. In fact, a Titan system can help transform conventional equipment into better performing, more efficient growing systems.

In this issue of the Argus Advisor we are showcasing a couple of very different recently completed projects. We'd also like to give you a first look at some important new additions to our product line that will be released this summer.

Argus Classic system customers:

As excited as we are about the capabilities of the Titan system, we continue to provide full support for our classic systems. These systems are long lived and reliable, and we expect that most of our existing customers will continue to be satisfied with the capabilities of their Classic systems for many years to come. If you are planning to expand or upgrade your facilities, you'll most likely prefer to continue with your Classic system, but you always have the option of undergoing a major system upgrade to give you all the latest features of the Titan system. We can help you to determine which option makes the most sense for your situation.

Alec Mackenzie

### Titan System Featured at Future of Agriculture Event



Greenhouse solar collection array

On May 14th the Houweling Hothouse Group unveiled its 40 acre greenhouse vegetable production facility at its Camarillo California location. This new ultra-high technology facility features large solar collectors for generating heat and electrical energy as well as many other technological advances designed to produce record yields while simultaneously minimizing expensive production inputs.

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### See you in Ohio!

Be sure to stop by and see us once again this summer at the Ohio Short Course, July 12-14th, Booth 1021.

# Take Control With Argus

The semi-closed, positive pressure controlled greenhouse system offers a number of potential production advantages over conventional greenhouse designs including:

- increased yields through better light transmission, precision climate management, and enhanced crop uniformity
- on-site solar heat and electrical collection to offset purchased energy costs
- reduced cooling ventilation requirements
- reduced heating costs
- improved insect exclusion and disease reduction
- reduced water and fertilizer use through recycling and runoff containment
- enhanced CO<sub>2</sub> enrichment efficiency

The Titan system manages the collection, storage, and distribution of the collected solar energy and integrates this source of heat into a conventional hot water heat distribution system. The control system also manages and integrates other heat sources extracted from cold storage chillers, and irrigation water cooling systems.



Air intake insect screening along the entire gable end. The air mixing chamber is located just inside the gable end.

Outdoor air is pulled through an insect screen, across an evaporative cooling pad and into a large air mixing chamber that runs the full length of the greenhouse gable end wall. Liquid CO<sub>2</sub> is injected into this chamber and an air mixing damper regulates the mix of outside makeup air and inside recirculated air that is picked up by variable speed air circulation fans. The air passes over hot water heating coils and is then evenly distributed through poly tubes located under each crop row. Excess air is vented out through a small number of roof vents and the rest is recirculated back to the fans.

The Argus system carefully regulates each system component, maintaining positive greenhouse pressures for insect exclusion while regulating air temperatures, humidity deficits, and CO<sub>2</sub> levels according to the complex crop production models used by the growers. Since all air exits the greenhouse under pressure, flying insects are unable to gain access through vents, open doors, or unintended openings. Fan speeds are kept as slow as possible to conserve energy. This recirculation strategy reduces the amount of ventilation, making it much more cost effective to maintain elevated levels of CO<sub>2</sub> throughout the day.

Located in water-starved Southern California, all water from condensation, rainfall, and irrigation runoff is captured, treated, and recycled for a 66% reduction in water use compared to conventional greenhouse growing methods.

The Argus Titan system controls the nutrient injection units and monitors the EC, pH, and water temperatures. The calculated amount of water delivered to each dripper is monitored and checked using overdrain collection and measurement equipment connected to the Titan system.

Argus worked closely with the Houweling design and production team to engineer a control solution that would address the unique equipment integration challenges for this new class of greenhouse vegetable production system. We developed new monitoring and control es for



Pressure controlled air distribution under the crop

strategies for each system component and then created the computer models to integrate these control strategies into a single, coordinated system. We continue to enhance and fine-tune this system as new equipment is brought on line and the facility moves through its first full production year.

For more information on this project, please visit: [www.houwelings.com](http://www.houwelings.com)



Thermal storage tanks

## Announcing the New Titan Omni-Sensor

The new Titan Omni-Sensor is an aspirated module for in-zone climate monitoring. It combines temperature, humidity, light, and optional CO<sub>2</sub> monitoring into a compact unit that can be suspended anywhere in the zone. The Omni-Sensor can be used in a wide range of applications including high humidity propagation environments.

Omni-Sensors feature easy connection to any remote Titan I/O module using a simple 2-wire plug-in sensor cable for easy installation, servicing, and calibration checks. A convenient on-board display shows the current values for all readings and accepts operator entered CO<sub>2</sub> sensor field calibration adjustments.



Omni-Sensor with plug-in cable



### The Omni-Sensor boasts some impressive specifications:

- Two temperature sensors are included with a factory calibration accuracy of better than 0.1 °C. Total calibration errors are better than 0.2 °C over the working range of -5 to +50 °C.
- RH sensor accuracy is +/- 1.8% over a reading range up to 100% RH.
- A high resolution integrated light sensor is included for measurement of the local light conditions at the sensor location. This is useful for confirming the operation of shade and blackout curtains as well as supplemental lighting equipment.
- The Omni-Sensor is available with an optional 0-2000 ppm CO<sub>2</sub> sensor with an accuracy of +/- 50ppm + 2% of measuring value.

## Wood Kiln Control for Quality Hardwoods



Nardi Dry Kilns being unloaded

Since many industries have similar control requirements to greenhouses, Argus also provides control and monitoring equipment for other industrial and commercial markets.

This includes a recently installed system for Quality Hardwoods of Powassen Ontario.

Quality Hardwoods purchases green lumber from sawmills throughout Quebec and Ontario for drying in special Nardi timber kilns. Hardwoods must be dried with great precision to produce a top quality product. The drying rate must be carefully controlled to minimize defects and eliminate check cracks and warping.

The Argus Titan control system manages the kiln environment by monitoring the temperature and humidity and uses special calculations for calculating the wood equilibrium moisture content. This information is then used to regulate the temperature and humidity during the drying process. The air flow within the kiln is also periodically reversed to ensure even drying throughout the kiln.

For more information please visit:  
[www.qualityhardwoodsltd.com](http://www.qualityhardwoodsltd.com)

## Wireless Moisture Sensors for Titan Systems

Argus is now offering an interfacing option for using Decagon wireless moisture probes with the Titan system.

Decagon moisture probes determine the volumetric water content of the soil or growing media by measuring the dielectric constant using capacitance/frequency domain technology. A range of moisture probes can be connected to suit a variety of remote moisture sensing applications. The sensors incorporate high frequency oscillation, enabling them to accurately measure soil moisture with minimal salinity and textural effects.

There are also options for direct-wired connection of Decagon sensors to both Titan and Classic systems. We'll have a complete system on display at the Ohio Short Course. Check our web site for additional details or call Argus.

