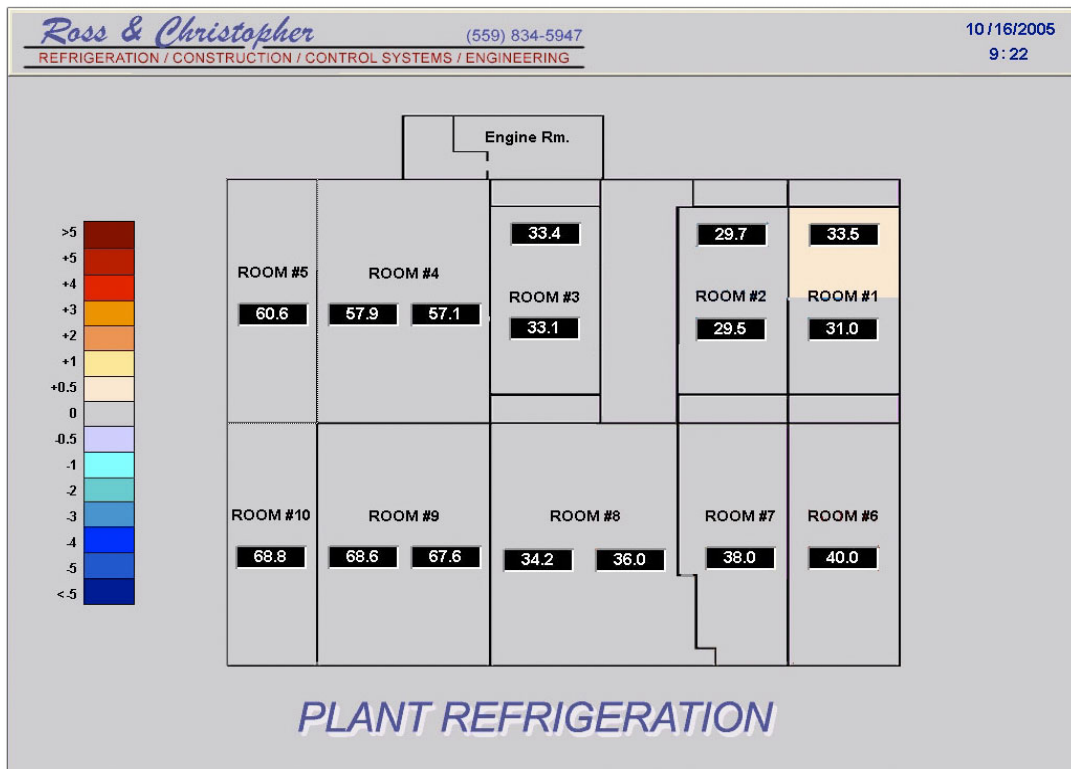


Ross & Christopher

Builder of Agricultural Refrigeration Plants Uses InduSoft for Cooler Controls



- InduSoft delivers graphics and functionality of software costing hundreds of dollars more per license.
- Remote monitoring over internet eliminates on-site trips for tech support, improves customer satisfaction.
- Provides trending and historical data for customer audits.
- New operator interfaces preserve look and feel of previous Ross & Christopher systems.
- Elimination of OPC server and reduction of programming effort cuts engineering time by 25%.

Each refrigeration plant is controlled from a central PC. This overview display allows an operator to monitor status of each area at a glance. Detailed data from each room can be called up by clicking on the appropriate area of the display.

Alan Ward
Control Systems Engineer

Background

Ross & Christopher has standardized on InduSoft Web Studio for refrigeration controls because it requires less engineering time and reduces overall project costs.

Located in the agricultural heart of California, Ross & Christopher is a rapidly growing design/build construction firm with broad experience in the design and construction of refrigerated food processing, packing and storage facilities. The company handles projects that

range from modest modifications to existing refrigeration systems to the turnkey design and construction of major food processing plants. It has approximately 100 employees, with a staff of four in the engineering section.

Ross & Christopher engineers, builds cooler control systems

The Ross & Christopher refrigeration staff has been designing and installing ammonia refrigeration

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systems for over 25 years. The seasoned, in-house refrigeration team designs each system, selects appropriate equipment and installs it on site. The controls department customizes a Programmable Automation Controller (PAC) based system to operate the 200- and 300-hp screw compressors which are standard; the control system provides optimal energy usage, remote site monitoring, regular operational reports and temperature logs. A separate ammonia refrigeration service staff handles start-ups and service for installed equipment and systems.

Because control system engineering is done in house and represents a significant part of the competitive advantage of Ross & Christopher, a premium is placed upon efficiency and cost containment.

Refrigeration Plants Require Multi-zone Cooling and Remote Monitoring

Automated control systems are needed by the operators at refrigeration plants that store the country's major supplies of beef, tree fruit, grapes, dairy products and other perishable food stuffs. Operator displays in these plants need to be intuitive and easy to understand without sacrificing functionality.

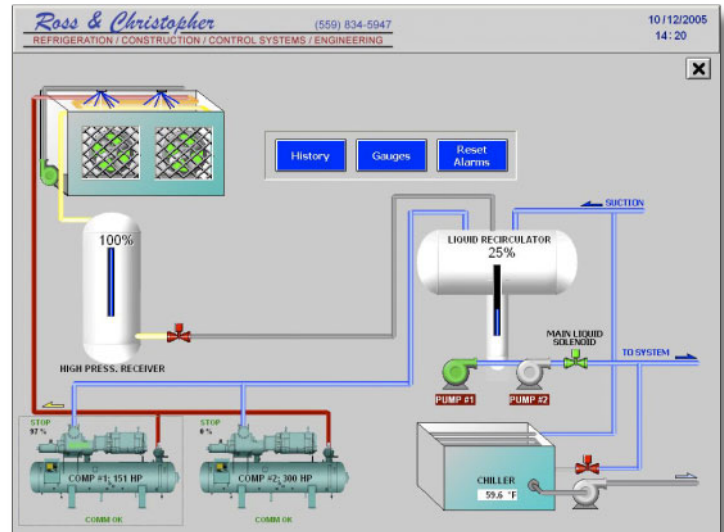
Ross & Christopher includes remote monitoring and diagnostics as a standard feature of such control systems, to allow remote monitoring by the customer's corporate staff and to reduce on-site service calls by the engineering personnel responsible for servicing the control system.

A refrigeration plant typically consists of three areas where monitoring and control are performed:

- Engine room, where ammonia refrigerant is compressed and liquefied by 200 and 300-hp compressors. The PAC for this section handles compressor controls, condenser controls and system alarms. Energy-efficient operation in this area is critical.

- Precooling area, where rows of incoming product are placed under tarps and a flow of chilled air brings it rapidly down to storage temperature.

- Main cooler, a large room where racks of product are warehoused while awaiting delivery. This area is cooled with large ceiling units with fans and refrigeration coils.



Top:

This engine room operator display shows two screw compressors that control suction pressure, with condensers on the top left that control system discharge pressure. The tank in the middle left is a high pressure receiver that contains ammonia (refrigerant) in liquid form, and on the right is a receiver tank. The system chiller is the green box on the bottom. Cold refrigerant goes out via the line labeled 'to system.'

Bottom:

Typical engine room with compressors and tank for liquefied refrigerant

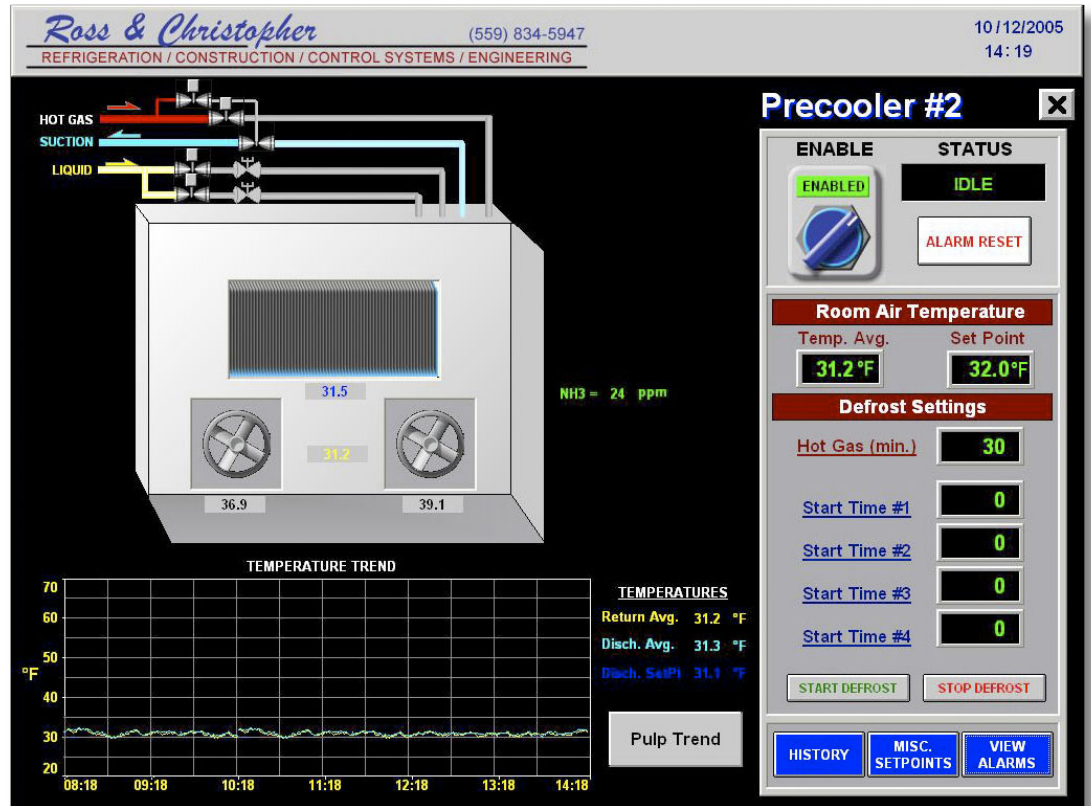
Each cooling unit has to be defrosted on a regular basis to maintain maximum efficiency; the control system does this automatically in addition to directing flows of chilled ammonia and starts/stops of fans.

Displays in the standard Ross & Christopher control system interface over a network with ICP-DAS WINCon PAC's (programmable automation controllers). Approximately 1400 I/O points from the compressors and temperature sensors are hard wired into PACs located in each of the three areas.

**InduSoft Web Studio
Eliminates OPC Server,
Reduces Engineering Time**

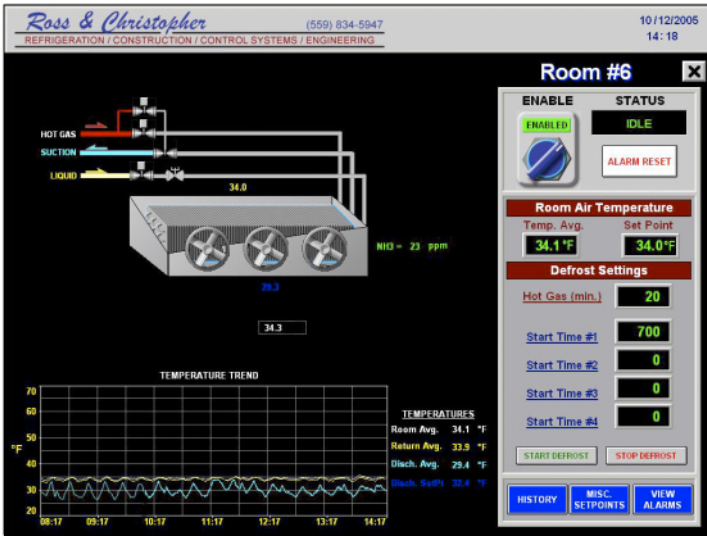
Prior to learning about InduSoft, Ross & Christopher used a control system architecture involving an OPC server and a SCADA package from a major PLC supplier. This meant each I/O tag had to be configured to work through OPC in addition to having its operating parameters configured.

The engineering staff became aware of InduSoft because the Windows CE version was supplied as a local operator interface embedded on the WINCon PAC's. Investigation revealed that the InduSoft Web Studio included a ModBus



Top:
This precooler chills incoming product rapidly before it is moved to storage. This graphic trends the temperature data at the bottom and shows both cooling and defrost data on the control console on the right. The animated pictorial display of the cooling unit shows status of refrigerant flow and fan operation.

Bottom:
Each individual precooler room is monitored separately.



Ethernet driver as a standard feature. This would eliminate the cost of an OPC license and the engineering time spent configuring OPC connections the PAC tags. This alone reduced time to completion on a project to two to three weeks and meant a savings in engineering time of 25% or more.

An InduSoft sales engineer came on site and demonstrated how to build screens that matched

the ones on existing systems. Ross & Christopher engineers concluded that the InduSoft package provided graphics features and functionality comparable to software licensed for hundreds of dollars more.

As far as the end users are concerned, there is no difference between the InduSoft-based control system and one costing thousands of dollars more. Remote monitoring over the internet or dial up connections functions as well or better than the previous solution; trending and historical data are readily provided for customer audits; and the operator interfaces preserve the look and feel of previous Ross & Christopher system.

Contacts:

Alan Ward
Control Systems Engineer
559-834-5947 x116
award@rossandchristopher.com

Ross & Christopher
Refrigeration & Construction
7828 South Maple
Fresno, CA 93725
559-834-5947
559-834-2207 (fax)



Above: Main storage rooms are controlled from multiple graphics like this one. The same control console appears on the right and trending information about temperatures is again on the bottom. The unit in the center left represents an air unit that hangs from the ceiling. A refrigeration plant can require chilling and monitoring temperatures in extremely large volumes of space as shown above.



Headquarters
200 Professional Building New Orleans Road
Hilton Head Island - SC, USA 29928
Phone: (843) 842-6668
E-mail: info@InduSoft.com
www.InduSoft.com

Sales and Marketing Office
3445 Executive Center Drive, Suite 212
Austin, TX, USA 78731
Phone: 877-INDUSOFT or 512-349-0334
E-mail: info@InduSoft.com

Engineering Office
Av. Eng. Luis Carlos Berrini, 962 8º andar
São Paulo, SP Brazil 04571-906
Tel: (11) 5505-0093
Fax: (11) 5505-1672
E-mail: info@InduSoft.com