



Process: Aeration Control  
Integrator: Industrial Automation  
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## GRAIN AERATION CONTROL SYSTEM FOR CBH VersaTRAK RTU keeps grain fresh in Western Australia

### Overview:

Co-operative Bulk Handling (CBH) is a grower-owned cooperative that is responsible for the centralized storage of grain in W.A. (Western Australia). This grain needs to be monitored to prevent spoiling.

### Problem:

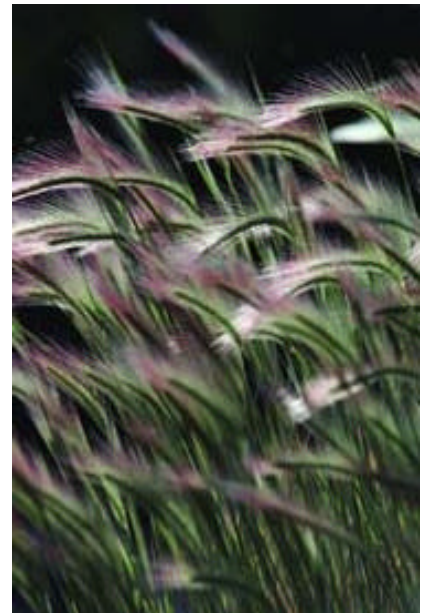
The majority of grain that is produced in Western Australia will be stored for a period of time. During this time, it is of critical importance that the moisture content and temperature of the grain be controlled so as to reduce the risk of spoilage. These conditions can be controlled by a process known as 'Aeration'; i.e. pumping air through the stored grain via fans, ducts and exhaust vents.

Industrial Automation was to design, supply and install the aeration control systems for various existing grain storage locations throughout Western Australia. This included the supply and design of a control system using a PLC/RTU, an Operator Interface Panel and motor starting equipment.

### Solution:

CBH required a complete control system solution, capable of controlling the aeration fans based on environmental conditions, and also capable of monitoring the performance of the system via real-time data-logging of temperature and humidity readings (both inside and outside the grain). Installations were in remote locations, so the control system installed must be extremely reliable, withstand high operating temperatures, and support remote data access and control. The control system must also be scalable, with expectations of connecting existing thermocouple probes (up to 160 per site, monitoring the internal storage temperature of the grain) in the near future. In short, CBH required a SIXNET control system!

Industrial Automation designed, supplied and installed a SIXNET-based control system that was capable of all of the above and much more! The new aeration control system allows the operator to



set the desired setpoints for both temperature and humidity. When the external temperature and humidity readings are both below their respective setpoint values, the aeration fans are operated.

The touch screen Operator Interface provides the operator with the following functions:

- Raise/lower the temperature/humidity setpoints
- Monitor the current temperature/humidity readings
- Monitor the system alarms
- Monitor status of fan motors
- View historical trends
- Configure the control system (password required)

The performance of the aeration control system can be monitored by periodically uploading the data-log file from the SIXNET PLC onto a laptop computer (this will be done via a modem connection in the near future). This file contains the grain temperature, external temperature, humidity and fan run hour readings for the last 3 months. To date, Industrial Automation has installed Aeration Control Systems at 11 locations throughout the state of Western Australia.

#### **SIXNET Hardware/Software:**

Each aeration control system (11 systems so far) included the following SIXNET Hardware:

- 1 x VT-M2-220-44P Mini-VersaTRAK (with 2 x RS232 communications ports and 1MB RAM)
- 1 x ST-DI-024-16H 16pt Digital Input Module (for feedback from the motor starters)
- 1 x ST-DO-DC2-16H 16pt Digital Output Module (for control of the motor starters)
- 1 x VT-MODEM-1EC (Future – to allow remote connection for logged data transfers and remote monitoring/control)



#### **Other Hardware:**

Each aeration control system (11 systems so far) also included the following major components:

- 5" monochrome touch screen (Quick Panel from Total Control Products)
- Up to 4 soft starters (7.5kW to 45kW)
- 1.2m long aluminum cubicle
- 1 x Rense Weather Station (temperature and humidity)
- 2 x RTD Grain Temperature Probes 300VA Industrial UPS



**ISaGRAF Workbench size:** 256pt License

#### **HMI/SCADA software used:**

Future - Industrial Automation is to develop a simple Visual Basic application that will allow a remote operator to dial-in to each of the aeration control systems and upload logged data, view the current operating status, check for critical system alarms, modify temperature/humidity setpoints, etc.