ACRODYNE
Actuation and Control

BI-MONTHLY ACTUATION AND CONTROL SOLUTIONS NEWSLETTER

TECHTORQUE

VOLUME SIX ISSUE THREE

News

Tribute to Graham Fergus

Graham Robert Fergus passed away at his home on June 17th 2009 at the age of 69. Graham leaves a legacy of over 30 year's association with (amongst other disciplines) Limitorque valve actuators. Graham was the first employee of Pryde Measurement in the mid 1960's. Pryde Measurement was started by George Pryde Patterson, (Graham's mentor)in one room and half a room for a store at 62 Wellington Parade East Melbourne. Control Engineering (Aust) Pty Ltd was formed in 1963, for which Graham became manager and then CEO and part owner till his retirement. Control Engineering initially represented Limitorque products in Victoria only. Late in the 1960's Limitorque products were used extensively for the developing Bass Strait oil fields, during this time the Limitorque agency was transferred from Underhill Day of Brisbane to Control Engineering; Limitorque enjoyed continued growth under the leadership of Graham.

Graham had the ability to extract the very best from people he employed; testament to this can be seen in the people who have been successful in all types of endeavour. Today the Limitorque name continues on through Acrodyne, we are proud to be part of a rich heritage spanning nearly 50 years, with almost all of those Limitorque actuators Graham installed all those years ago still running strong.

Our deepest sympathy goes out to Graham's wife Jan, daughter Michelle, son Scott and their families, he will be sadly missed.

Limitorque's QX has been nominated in the 2009 Flow Control Innovation Awards

Limitorque's newest product, the QX, has been nominated for Flow Control magazine's 2009 Flow Control Innovation Awards. The QX was selected by one end-user for use as the actuator of choice for installation onto small two-inch to four-inch plastic ball valves and three-inch to ten-inch butterfly valves. Its non-intrusive features permit control configuration via an LCD screen. The brushless DC motor allows both single- and three-phase supply voltages at the site to be supported without changing motors.

The QX is lightweight and compact, easily meeting the dimensional requirements for placement of the valve and electronic actuator combination. The QX supports Modbus, a two-wire network digital control that facilitates control of the more than 700 actuators at the site over a Supervisory Control and Data Acquisition (SCADA) system.

Noah Spring Return Electric Actuator

The Noah quarter turn electric actuators are now available with the spring return option for torque ratings up-to 200 Nm and power supply voltages of 110/240 VAC 1Ph, 440 VAC 3Ph & 24 VDC. This option utilises a totally enclosed spiral spring connected in series with the actuator out-put drive.

In the power on mode the motor drives the out-put shaft simultaneously compressing the spring. An electro-magnetic brake locks the out-put shaft preventing the spring from releasing it's energy. On loss of power or in the ESD mode, the brake is released and the spring drives the actuator to a fail-safe position. Spring travel time is 2 secs.

The addition of the spring return option to the Noah range makes it a very reliable, economically priced and a versatile actuator for on/off & position control for quarter turn valves & dampers.

Welcome to the third issue of Techtorque for 2009. Your feedback about our newsletters as well as your suggestions for any particular products or applications that you would like to read about is always welcome. With your input, we will do our best to provide you with informative and relevant reading matter. Please email your comments and requests to our Sales and Marketing Manager, Chris Hoare, at choare@acrodyne.com.au

Wireless monitoring of valves

The Industrial Valve Market

World demand for industrial valves is forecast to increase by over 5% per annum up till 2009 (including price increases) from US$52 billion in 2004 to US$66 billion. This represents a substantial improvement over the period 1999-2004, reflecting accelerating macroeconomic growth in the developing regions of Asia, Latin America and Eastern Europe according to World Industrial Valves, a 2005 Freedonia industry study, which provides historical demand data as well as forecasts to 2009.

The Need

In today's industrial environment, systems and equipment must perform at levels thought impossible a decade ago. Global competition is forcing industry to continuously improve process operations, product quality, yield and productivity using fewer people than ever before. Production equipment must deliver unprecedented levels of reliability, availability, and maintainability as plant managers seek ways to reduce operational and support costs and to eliminate or minimize capital investments. In short, industry must invoke new measures to improve production performance and safety while minimizing costs and extending the operational life of new and aging equipment. Sensors are found in large numbers in every process line. Each and every one of them requires data transmission and power cabling. Not only are these cables costly to engineer and install, they are also one of the most frequent sources of failure in the process line, where a considerable amount of sensors are moving or exposed to harsh environmental conditions. Therefore, it is here, at the field device level, where problems with wires really exist for the users. The various field buses which have found their way into most applications in the past few years have not changed the situation. The sensors are still typically connected via wires in a star topology to bus concentrators. Wireless sensor systems can revolutionise industrial processing and help industry meet the demands of increased competitiveness. Intelligent wireless sensors built for ubiquitous use in industrial environments will enable real-time data sharing throughout a facility to increase industrial efficiency and productivity. Moreover, wireless sensor technology offers reliable, autonomous process control to improve product quality, increase yield, and reduce costs. The benefits of wire sensors are: Lower Cost of Installation: Wireless systems could ultimately eliminate tens of thousands of feet of wiring from the average industrial site. Such wiring can cost US$50 to US$100 per foot including labor. Specialized wiring for harsh environments can cost as much as US$2,000 per foot.

Lower Cost of Maintenance: As wires age, they can crack or fail. Inspecting, testing, troubleshooting, repairing, and replacing wires require time, labor and materials. If wiring faults cause a production stoppage, costs escalate rapidly.

Wireless systems obviate any costs associated with running new wires and eliminate associated downtime. Reduced Connector Failure: Most failures in any network occur at the connectors; wireless sensors eliminate this problem.

Improved Flexibility: Without the constraint of wires, plant managers can better track materials and more easily re configure assembly lines to meet changing customer demands. Freedom from wires also allows greater flexibility in sensor placement - Particularly in the case of mobile equipment (e.g., cranes and ladles).

Rapid Commissioning: Simple wireless sensor systems can rapidly organize and configure themselves into an effective communications network. Self-calibration and verification are on the horizon, opening the possibility of deploying ad hoc systems to explore a range of production scenarios.

Wireless Systems Create Value

Significant technological advances exist at bench-scale in labs across the world. These technologies need to be brought forward and integrated with other emerging technologies to realize the full potential of wireless systems. As the se systems move into wider use, industrial end-users will gain greater flexibility and discover new possibilities. Low-cost, high-performance, easily deployed wireless devices will change the way end-users view sensors and sensor systems. The ISA organization has established the standard committee on wireless systems for automation ISA-SP100 and nowadays is working on the first draft (ISA-S100.11a) of the Wireless Network Optimized for Industrial Monitoring (www.isa.org/isasp100/). The Wireless HART protocol has been released lately, and products are expected to reach the market in 2008.The main attributes of a wireless solution should be: reliability, ease of use, security, a robust design, and open architecture.

The Exploding Wireless Sensors and Actuators Field

Among the endless opportunities in the exploding wireless sensors field the wireless monitoring of valves position is identified a special and unique wireless sensor application which was not tackled by the industry so far. All the wireless vendors provide wireless nodes, compatible with various wireless technologies (WiFi, Bluetooth, ZigBee, proprietary protocol communication) which can act as a wireless sensor. However meaningful effort is still required to make the wireless node to sense the position of a manual or actuated valve. Industrial ball valves constitute about 25% of the entire yearly valve market totalling about US$13 billion in 2004. This corresponds to about 75 million industrial ball valves of various sizes sold every year. Most of the ball valves sold (80%) are manual, without any remote monitoring capabilities. About 50% of the actuated industrial ball valves sold are without any monitoring capabilities. All the valve positioning monitoring devices sold today are wired.

Companies in the various Process Industries indicate that, today, there is a need for monitoring capabilities for manual and actuated ball valves. This will increase line safety, provide compliance to regulations, improve yield, and decrease operating line cost, etc. The option to install a wired monitoring device on the manual or actuated ball valve is not practical due to the cost of wire installation when the process plant can have thousands of ball valves. Interestingly, not all installed actuated industrial ball valves have positioning or monitoring capabilities. The main reason not to install this feature is the cost of wiring to the monitoring device. Once a low cost wireless device is introduced it will capture market attention and will be available with every actuated ball valve.

Upgrade of a Process Line-to-Wired versus Wireless Monitoring of Valves

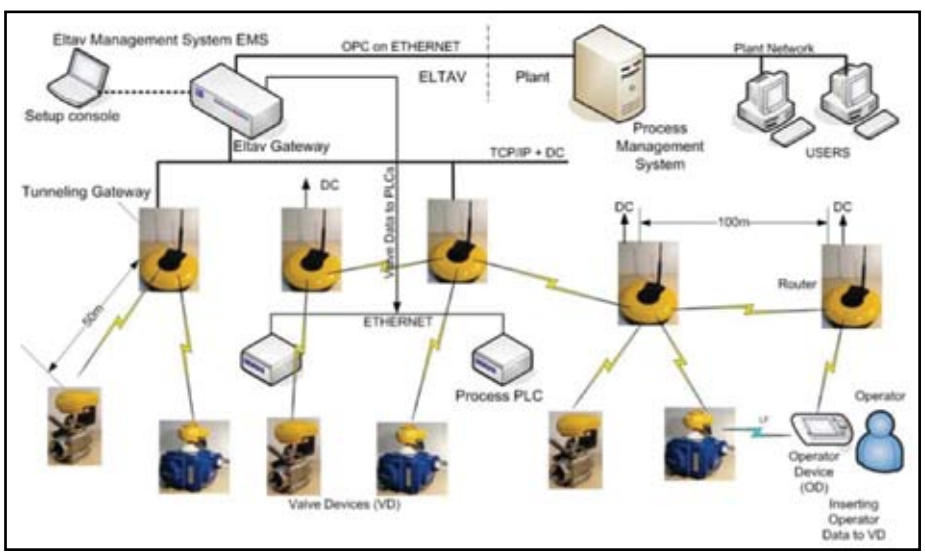
We present the case of a process line site with 5,000 industrial manual ball valves which is planned to be upgraded and all the ball valves are required to be modified to include monitoring. We will compare an upgrade with a wire-based solution to that of a wireless solution. We assume that the average home run wire from the valve to the concentrator is 100feet and the installation of 1 foot costs US$50 (lower end of the range). We also assume that wiring from the concentrators to the control room is equal to the wiring from the router to the control room. Further, the cost of a wired concentrator for 50 devices is US$1,000.

A Solution Example, Technology and Products

We describe a wireless solution which utilizes available wireless communication technology to allow wireless monitoring of industrial ball valves (other valves can be connected accordingly) in the process industry, and thus eliminates costly and cumbersome wires. However, the wireless technology comes with its own set of challenges - propagation, interference, security, regulations, etc. Some control applications can afford the cost of adding a high-end wireless communication system such as cellular phones, WiFi and so on. Nevertheless, the described wireless application will benefit if the technology is relatively low cost, is reliable and robust, and is a standard compliance so it will drive interoperability among different manufacturers with direct benefit to the end consumer. The IEEE 802.15.4 Zig Bee wireless network is an example of such wireless technology. When ISA SP-100 is released and available and when Wireless HART technology is available it can replace and outperform Zig Bee technology in the process industry. The wireless network is designed to be robust and reliable, low-cost and very low power and is a relatively short range wireless communication.

The relatively low data rate (0.25 Mbps) achieved with a ZigBee network is adequate for ball valve monitoring requirements. The ultra low power consumption and the low cost features of ZigBee make this technology the best choice for the application of valve monitoring. To achieve the goal of low total product cost as well as long battery life for low operating costs, the ZigBee/802.15.4 provides reasonable trade-offs in several performance metrics. To control the administrative costs of both the implementer and the user, ZigBee devices employ unlicensed radio bands. The ZigBee device is designed to be relatively short range and without infrastructure thus it utilizes various network topologies. Due to the power consumption of practical wireless circuits, it is impractical to attain low power consumption under constant operation. ZigBee is designed to support very low duty cycle operation.

The 802.15.4 ZigBee standard allows devices to operate at low duty cycles with both the transmitter and the receiver inactive for most of the time. The described valve device operates at least five years on one lithium _ AA battery, assuming 100 updates per day. An example of implementation of a wireless monitoring solution of valves was used in a system from Eltav/Habonim Wireless Monitoring Ltd in Israel. The installation of the monitoring device was on a manual valve and on an actuator: The wireless valve monitoring device can be installed on valve actuators (NAMUR interface) or on manual valves (ISO 5211 Inter The small battery powered valve device (VD) can be installed on existing or new valve actuators or manual valves. The valve device can operate at least 5 years on one battery, which is field replaceable. A network of the routers are spread around the plant and use mesh technology in order to convey the received valve device messages to the System's TCP/IP based Gateways. The Gateway transmits the valve data to the plant management system through an OPC protocol or any other standard protocol. The valve data can be pushed to process line PLCs to allow incorporating valved at a into the process operation. The valve device provides not only open or closed states of the valve, but also measures the valve's angle position in degrees, at ±0.50 deg accuracy with 0.10 resolution. The valve device also provides its temperature, battery status and other house-keeping information. The valve device has inputs to collect data from the field (analog and digital) and outputs to deliver commands to field devices in future upgrades. The valve device collects the dynamics-of-state change of an actuated valve and transmits it as a 64 points packet, thus providing proactive data on the actuated valve set face). The operation of the valve device can be commissioned and programmed from the system server as well as from a hand held operator device which allows short range low frequency communication with the valve device. The following diagram below shows the system implementation. The



current product utilizes a Zigbee chip set from Ember. However, once theSP100 or Wireless HART (two new standards for wireless applications in the industry) are released and a stock is commercially available, the product will be upgraded to the new ISA-S100 or HART standard. The system is designed to maximize the probability of message transfer from the Valve Device to the Management System. At preliminary pilot tests a 100% data transfer has been demonstrated (460,00 messages with no losses, however, with less than 0.1% of retries or rejoins). The measured average latency is less than 50 ms.

For more information about this product please call Acrodyne on 03 8727 7800

Article written by Israel Radomsky, a Founder and the CEO of Eltav Wireless Monitoring Ltd.

Internal News

Alpha Electrics - Tasmanian Service Agents

Acrodyne are pleased to announce the expansion of our distribution and service network with the recent partnership with Alpha Electrics , Tasmania's largest supplier and repairer of electric motors and has been serving the community since 1967.

The company is Tasmanian owned and operated by Anthony Butler, Steven Phillips, Stuart Paine and their families. Anthony, Steven and Stuart have over sixty years experience between them having completed their apprenticeships and worked with the company for the majority of their working lives.

Alph Electrics provides a statewide service from its four well equipped branches at Burnie (Head office), Devonport and 2 locations in Launceston. All branches are fitted with a job tracking program that allows us to monitor the job process whilst it is in progress and all the relevant information is stored for future reference if it is required. Staff at all branches are equipped to provide around the clock sales and servicing and can offer a pick up and delivery service for urgent work.

"With the Electrical Contracting side of our business we can supply and install everything we sell and repair."

"Alpha Electrics core business is sales and repairs of Electric motors and Drives, Generators, Pumps and Gearboxes . Nearly everything we do has something to do with electric motors.
We are setting up each branch to cater for all pump repairs and servicing. We have a full range of Davey and Calpeda pumps and spare parts . We offer a 24/7 pump breakdown support."

"The business has the ability to complete on site work with access to a fully adjustable portable gantry crane, laser coupling and belt alignment equipment."

Other services available at Alpha Electrics include condition monitoring, thermal imaging, fitting and machining, vibration analysis, submersible pump repairs and parts, laser aligning and dynamic balancing.

Alpha Electrics are stockists and authorised service agents of Weg and Fasco electric motors, Bonfiglioli gearboxes, Davey and Calpeda water pumps and spares Genelite generators, Acrodyne actuation and control and Uras vibrators.

Alpha Electrics is able to source most makes of Electric Motors and offers drives, gearboxes, transformers, bearings and power transmission and a wide range of related equipment at competitive prices.

CHARACTER FIRST!

Importance of Humility

"Acknowledging the investment of others in my life by building an effective team, assist co-workers and develop friendships."

Why is Humility important?
Humility enables us to make build an effective team, assist co-workers and develop friendships.

5 Keys to Building Humility:

- "Get a perspective" – we always rely on people around us.
- "Share the credit" – remember those who have helped you.
- "Build teamwork" – greater achievement is possible through teams.
- "Seek advice" – admit we need help and remain teachable.
- "Serve others" – have a go at those jobs no-one else wants.

For more information regarding Character First contact Philip Greenwood at People and Culture on (03) 9018 7971 or 0411 131 449

www.peopleandculture.com.au

Want to win an iPod Shuffle?

To be in the running to win a Apple iPod shuffle with personalized engraving valued at $129, just answer 3 simple questions relating to this issue of Techtorque, go to www.acrodyne.com.au, follow the link to the competition page and fill in the online form marked "Techtorque Competition".

Entries close 5pm Friday 14th August 2009.

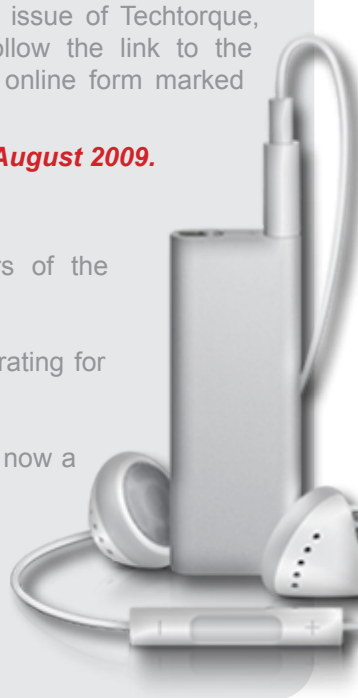
The all important questions are:

1. Who are the manufacturers of the innovative QX electric actuator?

2. What is the maximum torque rating for the new Noah SR range?

3. Which Tasmanian company is now a part of our service network?

The winner will be announced in the next issue of Techtorque..... Good Luck



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