PROCESS

DCS the Easier Way

As *Bob Gill* reports, getting a fully functional DCS solution while eliminating much of the usual cost and complexity commonly associated with distributed control systems can be an attractive proposition for end users.

When it comes to industrial control technology, there have long been two distinct solutions for end users. If you have high-speed requirements characterised by lots of discrete I/O, such as on a production line or for a machine, then you go for the PLC (programmable logic controller). If your application involves extensive analogue I/O and continuous processes in a large-scale facility, such as in the oil & gas and chemical industries, then you turn your attention to distributed control systems (DCS).

At these two distinct ends of the control application spectrum, this is still the case. And so you have companies specialising in PLCs targeting the time-critical requirements of the factory automation market, and the (Big Six) DCS suppliers there to meet the needs – such as alarming, advanced control, high availability – of the process industries.

However, in recent years there has also been some blurring in the PLC/DCS space. One of these trends has seen some traditionally strong PLC players extending and enhancing their automation technology in order to tap into the lucrative continuous process industries.

Another less discussed one has been that of DCS suppliers moving over to serve "middle ground" applications that for cost and size reasons have tended to favour PLC rather than DCS solutions. One of those companies is ABB.

"There are customers who do not need and will never buy a DCS," says Alfred Lee, vice president, strategic marketing, ABB Control Technologies. "However, there are also many plants that have adopted PLCs but are actually a better fit for a DCS solution."

Given that the perception (and reality) of a DCS is that of a large, costly, complex system requiring extensive engineering to get it implemented and ongoing maintenance to make sure it is all working correctly, it is perhaps not surprising that users have tended to prefer PLCs for applications that cannot justify the expense and engineering time associated with a traditional DCS.

But as Lee explains to *Control Engineering Asia*, the offer of a DCS at a price that is competitive with PLCs and does not overly stretch a company's in-house resources can be a very tempting one for customers. And that's where ABB's Freelance system enters the picture.

Towards the right fit

"When it comes to distributed control systems, ABB has two distinct offerings," explains Alfred Lee. "And these are categorised under Extended Automation and Essential Automation."

The Extended Automation offering is the well-known System 800xA, which was launched almost a decade ago and is ABB's solution for "extended" process automation applications – i.e. large-scale plants requiring high attention to operator effectiveness through sophisticated HMIs and featuring integration between control, safety, asset management, power and information systems.

As its name somewhat suggests, Essential Automation strips away some of the complexity that is bound to be inherent in any DCS offering for a large process application. The Freelance DCS is offered within this category along with something called Compact Product Suite, which is a comprehensive array of individual control products that can be used in combination or standalone.

The Freelance DCS from ABB.

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As Alfred Lee, vice president, strategic marketing, ABB Control Technologies, explains, the Freelance DCS has been developed to meet the needs of a specific target segment of control system customers.

ABB also segments its customer base into two types: Value Centric and Control Centric. And each has specific characteristics that sync the segment to the Extended or Essential Automation categories.

"Our Value Centric customer is likely to have a large and dedicated engineering and maintenance departments, and is also willing to pay a premium for a system that gives total enterprise optimised strategies.

"There also tends to be a "power sponsor" of the system within the organisation, and he would be typically someone in the higher levels of management. And in terms of sales channel, the approach and liaison is directly with ABB," explains Lee. "The System 800xA is ideal for this type of customer. A good example would be one of the large oil & gas majors."

The Control Centric customer exhibits markedly different characteristics. He is more price sensitive, does not have large engineering/maintenance resources, and is primarily after an easy-to-use, easy-to-engineer process automation system rather than a comprehensive integrated solution.

And the project sponsor is likely to come from plant operations or engineering rather than executive management. Typically, a systems integrator acts as the sales channel, rather than ABB.

"Accordingly, our Essential Automation offerings are the right fit for the Control Centric customer," notes Alfred Lee. "The Freelance system is a 'set menu' approach to providing a DCS. The Compact Product suite, on the other hand, provides a level of flexibility for the customer, who can pick and choose based on his specific requirements from an 'a la carte menu.'"

Freelance features

Should a customer plump for Freelance then he would be getting a system that, according to ABB, is easy to use, reliable, scalable, and value for money. Alfred Lee expands on each of these attributes.

"When we say easy to use, we really mean it! The complete system software can be installed on a standard PC in less than five minutes, which is something unheard of in the industry," he says.

Samir Manglani, Essential Automation assistant marketing manager, ABB Control Technologies, pointing out the features of the new AC 900F controller that is available with Freelance 2013.

"And you can learn it yourself in less than a week. You don't need to attend specialised training classes but can use self-learning materials such as DVDs.

"Together with the other advantages – easy to engineer, commission, back-up and maintain – it adds up to a pretty amazing offering in terms of use," says Lee.

The reliability evidence for Freelance comes from the fact that it has been around for close to 20 years (so proven in use), provides high availability, and requires a low level of maintenance. Meanwhile, the ability to start with a very small system (tens of I/Os) and expand to a much larger one (thousands of I/Os) gives customers a very useful degree of scalability.

So what makes Freelance value for money? "This is a direct result of the system's small footprint, the fact that it can run on any standard PC, and the relatively low expenditures with regards to engineering, commissioning and maintenance," explains Lee.

In terms of system architecture, four key components go to make up a Freelance DCS package: engineering tool (Control Builder F); operator station (DigiVis); controller (AC 700F/800F/900F); and I/O (S700/S800/S900).

As outlined to *CE Asia* by Samir Manglani, Essential Automation assistant marketing manager, ABB Control Technologies, The latest version of the system, Freelance version 2013, comes with a number of new features.

These include enhancements in the Control Builder F engineering tool, such as an intuitive auto router in the function block diagram (FBD) editor, the ability to open multiple editors simultaneously, and graphical project previews.

As for the hardware, the AC 900F is a significant new controller addition. This delivers double the performance of the previous controller generation (AC 800F) and offers more I/O capability (1500 v 1000) greater connectivity (four Ethernet ports versus the 800F'S two), a built-in SD card slot to facilitate configuration and firmware download, CPU redundancy, LCD display (optional) – and all in a smaller footprint.

Project experiences

To give a flavour of how users are availing themselves of all the purported benefits of the Freelance DCS, Alfred Lee relates the story of an American systems integrator by the name of Carolina Automation Systems (CAS).

This company, which previously only had experience implementing PLC projects, first heard about Freelance at ABB's Automation & Power World event in 2011. When it was awarded a mining automation project the following year, CAS realised that this DCS could be a better fit for the project and also help it meet the strict deadline imposed by the client, which required the facility to be up and running within eight weeks.

"It's worth noting that CAS had zero DCS experience, zero mining industry experience, and there was no process flow diagram made available from the client," recalls Lee. "Yet as a first-time user of Freelance, this systems integrator was able to deliver on this tough project schedule.

"A key success factor was the sheer time savings from being able to use the same engineering tool (Control Builder F) for the HMI, for the communications, and for the control functionality. A SCADA/PLC solution would have involved many more software applications, more tags, and taken much longer to design.

"While it may have not been a huge project in terms of scale, there were a lot of requirements with regards to aspects like alarming, trending, data archiving, which is where a DCS can really show its worth," explains Lee. "And at this year's Automation & Power World, CAS together with the end user, Wake Stone Corporation, was there to tell everyone its success story with Freelance."

Closer to home, in Thailand, faced with challenges to increase production volume while achieving a stable process, VS Group, a producer of industrial nitrocellulose, has implemented Freelance at its Nobel NC plant in Chainat province.

"We have increased our production efficiency and reduced our production losses due to the fact that we use Freelance, and this is affecting our bottom line in a very positive way," said VS Group CEO Mr Leum.

Plenty of potential

Although Freelance has been around for almost two decades and has developed large user bases in the specialty chemical industries in Germany and China, it can perhaps be said to be one of ABB's "hidden secrets".

"It's true that in the past we did not aggressively promote this DCS, and word-of-mouth was a big factor in its adoption. Once customers used it, they liked its ease of use, robustness and simplicity and tended to tell other people," says Alfred Lee.

"But now, especially with the new AC 900F controller, we are doing more promotion, including here in Southeast Asia, as we do believe there is a lot of untapped potential across many industries for applications that do not require all the extended capabilities of a DCS."

According to Lee, while some competitors also offer smaller DCS solutions, these tend to be scaled down versions of the mainstream DCS architecture and thus cannot offer the same simplicity in implementation as Freelance, which was developed completely separately from ABB's System 800xA and is distinctly different.

"For the customer who is looking for a right-sized, cost-effective process automation system that does not require heavy internal resources to design, install and maintain, then Freelance is a great choice. It really does deliver maximum automation for minimum engineering," concludes the ABB vice president. **CEA**