

Automation takes aerospace specialist to new heights

Following a management buy-in in 2011, the new Directors of FGP Precision Engineering has been undertaking a strategic change of direction to the pursuit of innovation and technology. While remaining predominantly a supplier to Tier One and OEM aerospace customers, it has redefined its customer base to focus on long-term partnerships that provide stability and growth for the business. In achieving this it has also focussed on its production strategies and processes that centres around major investment in automation from REM Systems and Erowa.

FGP Precision's business is 95 per cent aerospace but it mitigates this exposure to a single sector by working closely with customers who have different machining needs, so the spread of work ranges from Actuators, power generation and aircraft interior fixtures and fittings. This is proving to be a successful strategy, with turnover growing from £5 million in 2009 to around £9 million in the current financial year. The business has also recently relocated from its original 20,000ft² premises to a 76,000ft² in anticipation of its expansion plans.

"What we are developing is a portfolio of customers with different product niches, this gives us greater opportunities when our customers win business on different aircraft platforms. This ensures we don't have all of our eggs in one

basket, and we are projecting growth for the next 10 to 15 year," says Nigel Barnes, Commercial Director, FGP Precision Engineering. This growth in sales has also driven the changes in manufacturing strategies, with automation being a major element of these changes. FGP's initial foray into automation was the relatively small step of applying a manual pallet change system to a DMG five axis machining centre. This brought home the benefits of automation and was quickly followed by the installation of an Erowa robot loader, again to feed a stand-alone DMG machine. This generated major time savings with lights out operation a key factor.

"The one thing that you cannot reclaim in any business is time, once it has gone it is lost forever," says Nigel Barnes. "Therefore the reduction in set-up times that these initial automation systems brought and the additional machine running time that we achieved was a significant gain for us." This experience highlighted to FGP Precision how it could maximise its productivity and increase manufacturing flexibility, in terms of being able to produce one-offs, when customers had an urgent demand, for the same price that batch manufactured parts would cost. The next logical step was to increase the use of automation, taking it to the next level of sophistication. Working again with REM Systems and Erowa FGP Precision put plans in place for a full FMS system that would make use of existing and new DMG machining centres.





Installed in August 2013 and fully operational within a matter of weeks, the new system centres around an Erowa Robot Dynamic linear system that feeds two DMU 80 eVo linear and a HSC 55 machining centres. Due to the staged development of automation at FGP Precision the system was designed to handle three different pallet sizes, all of which can be fully utilised on any of the machine tools, with the Erowa software handling the necessary set-up information. In total the system, as it stands at present, has 155 pallet positions and one loading station. The pallets are a mix of 105 of Erowa's ITS148 pallets for smaller workpieces, 24 UPC pallets for medium sized components and 12 MTS 500 pallets for workpieces up to 500 mm cube and a maximum workpiece weight of 130 kg.

"Within four months of installing the Erowa automation system we are running at 68 per cent capacity, which we see as a fantastic achievement," says, FGP Precision's Engineering Manager. "This has outperformed our expectations and the availability of this capacity is helping to generate new business, such that we are already looking to expand the system to five machining centres, which is a relatively straightforward procedure. We also see the system as futureproof as the Erowa Robot Linear system that we have can service a maximum of eight machine tools, and it is almost plug and play to get to that stage.

"We see the Erowa automation system bringing three key benefits to our business, namely quality, service and value. In the first instance we are operating unmanned for many hours a day, so the process has to be 100 per cent reliable, which drives up quality and process security. In terms of service, we are in a perfect situation to meet customer demand for on-time delivery even when making to one-off orders. While the initial cost of £1.2 million may seem a lot, amortised over 15 years the cost to FGP is much lower than having the same capacity operating as stand-alone or cellular production. As a subcontractor we had to make automation work for us in our particular environment and ensure we gained the flexibility and productivity that we needed. Working closely with REM Systems and Erowa we achieved what we needed and the process of ordering, delivery, installation and commissioning was straightforward thanks to the detailed planning that went in beforehand. What we now have is a full

flexible manufacturing system that simplifies our production, delivers significant advantages in terms of flexibility and meeting customer expectations and eliminates any issues that we may have had in the past about batch sizes changing as volumes are less critical to Production".

This was all brought home at Christmas when, due to a specific customer requirement, the cell operated with a single machine over the nine day holiday. The spindle turned for 300 hours unmanned, with the exception of one hour a day when the operator restocked the pallets and made sure that the tooling was OK. So soon after installation this was seen as a magnificent achievement by FGP Precision. During these periods of unmanned operation the Erowa Manufacturing Control (EMC) software monitors every aspect of the system, including checking the tool list to ensure everything is in place, if something is missing, it automatically selects the next job in line, while flagging up the problem via e-mail or text. These messages can be targeted at specific employees, depending on whether it is a production issue or machine diagnostic problem that is being highlighted. This means the appropriate action is taken much quicker if and when it is needed. Another innovative feature of the Erowa system is Paper Board. This is a pictorial reference of every aspect of the part set-up that is presented to the operator at the loading station. Using this visual reference greatly simplifies the set-up process, making it more efficient.

Supporting FGP Precision Engineering throughout the process was Gloucestershire-based REM Systems, Erowa's long-term partner in the UK. "Automating machine tools and processes can save tens of thousands of Pounds in labour costs, allow machines to operate 24 hours a day, seven days a week and create additional machine capacity," says Peter Ryland, Joint Managing Director, REM Systems. "Therefore, it remains a puzzle as to why so many companies in the UK still consider that it is a technology too far for them. The foresight of the team at FGP Precision Engineering has given them a distinct advantage over their competitors. That said, they are not untypical of users of Erowa automation systems from around the world, who typically are manufacturing high value components on five-axis machines in batch sizes of 50-off being seen as large. A far cry from the perception of the volumes needed for efficient automation."