

Investing in a manufacturing future

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A major investment in new electronic manufacturing facilities will help to maintain control over components for precision metrology

Renishaw, one of the UK's leading engineering companies, has highlighted its commitment to maintaining its home based production facilities through a major investment in electronic manufacturing capability. However, this is far from simple altruism by a company that has won nine Queen's Awards in the UK recognising Technological Achievement, Export Achievement and Enterprise. The move to keep electronic assembly and test in-house, and at the leading-edge, has been taken to ensure that the company can maintain total control over product quality, and retain the development skills needed to enhance its position as a major innovator at the forefront of precision metrology.

The purchase of two Automated Component Mounting (ACM)

machines supplied by Assembledon, a Dutch company that is part of the Phillips group, has been made following an assessment of the SMT (Surface Mount Technology) component placement requirements needed to support the company's future strategy for new product development, and deliver the highest production quality standards. The first of these machines has already been installed and commissioned at the company's New Mills, Gloucestershire site, and now forms the nucleus of a new product development and introduction SMT assembly line (NPDI SMT).

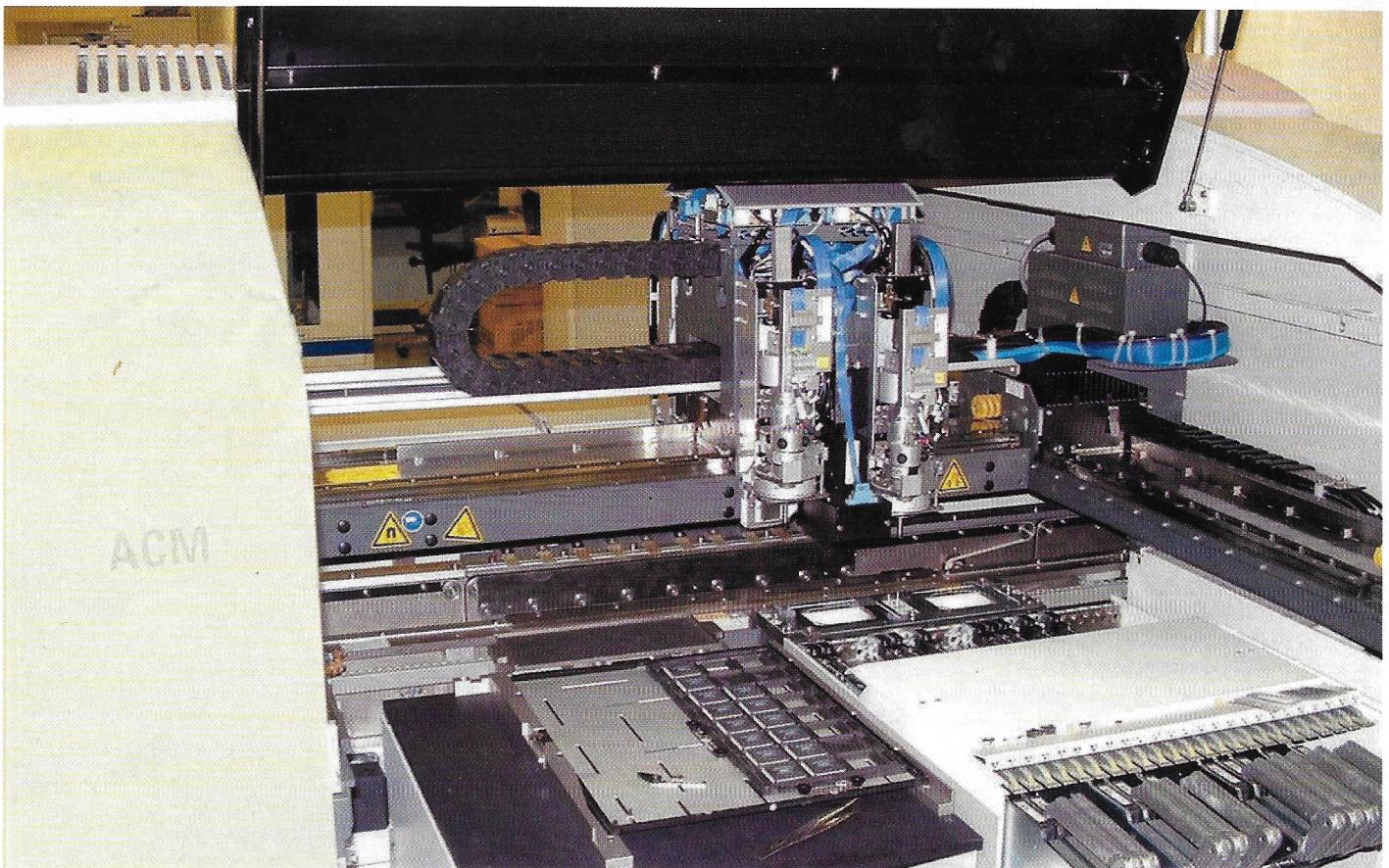
Once the production of each new product rises to certain threshold levels at New Mills and the project has matured to a position where the products engineering group can

provide the necessary logistical support, then the second machine will be commissioned at the company's main production facility at nearby Woodchester.

Versatile machines

The introduction of these far more versatile machines, as opposed to the existing Swiss-built Mydata TP11 pick & place machines, will significantly enhance the company's future development of electronic technology and chip infrastructure. For example, Micro-BGA's chip-scale packages, fine pitch QFP's (Quad Flat Pack - a device package type), odd-form connectors/flash prom holders, selected through-hole devices and flip-chips are just some of the components Renishaw will now be able to handle: some immediately, some with further process development.

The ACM's state-of-the-art low-friction linear drive system for long-term stability, and innovative 'per-placement' self-calibration of the fiducial and component vision system, deliver fewer than 10 defective placements per million (circa 5-based on 50-micron specification limits), without sacrificing speed. The machine's four pick-and-place robots (heads) can handle 100 different component types at up to 4500 components an hour.



View inside an automated component mounting machine at Renishaw. The machine's four pick-and-place robots (heads) can handle 100 different component types at up to 4500 components an hour.



Finished product area at the end of the SMT assembly line at Renishaw

SMT assembly

To augment the ACM pick & place machine, (within the NPDI SMT line at New Mills), and further assist quality initiatives, a Cookson/Speedline MPM Ultraprint 1500 solder paste printer and a selection of Nutek board handling equipment have also been purchased and set up in-line. The addition of a BTU Paragon 150 solder reflow oven in-line, completes an automated start-to-finish SMT assembly facility.

To enhance testing, an off-line flying (or roving) probe, functional testing machine has been purchased. However, also under consideration is the use of an Automated Optical Inspection machine (AOI), in line. The decision to go post or pre-reflow is close to being made and will depend upon the process validation and measurement strategy chosen. At a much earlier stage, but arguably equally important, is the evaluation of solder paste inspection and measurement machines. The intention is to analyse as carefully as possible the quality of paste deposition whether in-line or off-line before committing to device placement. This will include registration, true volume, scoop and slump amongst others.

It is intended that when the second ACM is commissioned at Woodchester, the set up will be automated in a line and mimic that now achieved at New Mills. It will also include the testing and measurement facilities currently being developed.

Process validation

The whole automated process will be validated and characterised by studious Quality Assurance initiatives and sound

engineering practice. The Renishaw goal is to work towards six sigma. This will be achieved by Gauge Repeatability and Reproducibility test process examination of each machine in the cycle and by using trusted 'Method, Machine, Man and Material' analysis and diagnostics. Sample SPC techniques will then be employed to control and monitor.

With the NPDI SMT now almost fully established at New Mills, and extensive programming, optimisation, comprehensive user and maintenance/fault-finding training having been completed, a technology demonstrator board is to be built. This will be used to highlight the advantages of the new electronic assembly capabilities now available. At the same time, the Production Process Development Section (of electronic engineering) is now happy to demonstrate to anyone interested, the benefits of ACM machines and the integrated automation.

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IIE legal helpline for business issues

IIE has entered into partnership with Putsman.wlc solicitors of Birmingham, one of the UK's leading specialist law firms, to provide members with a simple, free to members, legal helpline for assistance with their day to day business legal issues. The helpline is not designed to deal with personal matters like matrimonial or neighbour disputes, but is intended to assist with queries relating to employment, contractual issues and debt recovery for businesses. The helpline will run from 1 July 2002.

The helpline number is 0121 237 3070 and is open during normal business hours, 8.30 am - 5.15 pm, Monday to Friday. This is not a Freephone number and normal phone charges apply. Calls are strictly limited in duration to 15 minutes, and with one call only per problem. Members are therefore advised to plan their call in advance so that all the salient features can be covered within the free 15 minute advice framework.

The free helpline service does not include consideration of any documents or preparation of any letters etc. These would be chargeable to the member once relevant fees have been agreed with the solicitors. Often members may have legal costs insurance to cover this kind of work.

When calling the helpline, members will be asked for their membership number and brief identification details including name, address, post code and telephone number. All calls will be logged, but not recorded, for analysis purposes.

Summary

The IIE legal helpline is dedicated to meeting the career and business needs of members. When calling the helpline, members should ensure that their call is strictly limited to legal matters relating to employment, or business issues. Members should also remember that though initial advice is free during a 15 minute consultation, any specific work needed to resolve legal problems will incur charges, at rates to be agreed between the member and our partner law firm. Members' legal costs insurance may cover this kind of work.

For your free initial consultation call Putsman.wlc on: 0121 237 3070