The New Generation of Automated Optical Inspection

For years OEM’s and CEM’s were wooed by false claims of increased productivity and production yield through the use of Automatic Optical Inspection (AOI) Equipment. The fact of the matter is that many of the AOI systems that were available as few as five (5) years ago simply did not live up to these claims. There are countless horror stories shared by numerous manufacturing engineers about their initial venture into the “wonderful world” of Automatic Optical Inspection. Of course, there were a few systems out there that were half way decent at fault detection. But these systems were limited in capability, expensive, and very complicated to program, so much for “user friendly”. Ultimately, the only companies that had an opportunity to benefit from AOI were those companies that; first of all, could afford to purchase the equipment, and second of all, had the engineering resources necessary to program and operate the equipment.

Fast forward to today… AOI Equipment is one of the fastest growing market segments in the Electronics Manufacturing Industry. Perhaps the biggest reason why the AOI market has achieved such unprecedented growth is the advent of affordable equipment that is simple to operate and, best of all, actually works!

The driving force behind the AOI Revolution is basically human inefficiency. As difficult as it may be to admit, humans are no match compared to today’s AOI equipment:

- **Human Error** - Human inspectors make errors. This is evident by the high rate of returned materials, post human inspection.

- **Humans Are Inconsistent** - Simply give the same PCB to more than one operator for inspection and compare the results.

- **We Are Only Human** - Ever shrinking component packages have made it virtually impossible to inspect for manufacturing defects with the naked eye. i.e. 0.3mm (12 mil) pitch QFP’s, 0402’s, 0201’s, 01005’s etc.

- **Humans Are Too Slow** - The Inspection Department is typically the “Manufacturing Bottleneck”. A PCB which takes roughly 20 minutes to inspect manually may be inspected in under thirty (30) seconds with AOI.

The US market has changed quite a bit in the last five years. High volume manufacturing has moved offshore. The market is predominantly made up of low to medium volume, high mix OEM’s and CEM’s. This is a very demanding market segment. In order to be successful, an AOI vendor must address three basic requirements:
**Simple Programming and Operation:** The AOI equipment must be quick and easy to program. It stands to reason, that in a low to medium volume manufacturing environment with lot sizes ranging between one (1) and five thousand (5,000) PCB’s per production run, programming time is a major concern. Furthermore, in today’s lean manufacturing environment, engineering resources are at a premium. Therefore, AOI programming and operation must require minimal technical expertise.

**Superior Fault Coverage:** Today’s AOI equipment must not only be capable of detecting component presence / absence, polarity, and proper component markings. The machines must also provide *exceptional* post reflow solder inspection capability. Solder defects typically account for at least 70% of PCB manufacturing defects. It is no wonder why post reflow solder inspection has become such a critical requirement with today’s AOI customer. **BUYER BEWARE…** Many of today’s AOI systems claim to provide post reflow solder inspection capability, but when put to the test these systems fall by the way side. As with any capital equipment purchase, it is important to “do your homework” before you buy.

**Exceptional Cost / Performance:** Customers are looking for the biggest return on investment (ROI) for their AOI dollar. AOI machines must therefore provide exceptional performance at an affordable price in order to compete in today’s market. The days of the unlimited budget are long since past.

MIRTEC, a Global supplier of AOI equipment to the Electronics Manufacturing Industry, has done an excellent job of meeting and exceeding today’s most demanding AOI requirements.

In the year 2000, MIRTEC began to distribute their AOI products throughout North America. In the few short years to follow, MIRTEC has emerged as a Market Leader in North America. Undoubtedly, the company’s success is based on a commitment to bring to the market new and innovative products with a special emphasis on quality, accuracy, ease of operation and reliability.

“MIRTEC has emerged as a Market Leader in North America”

In 2004 MIRTEC Co, LTD, established a North American sales and service division in Oxford, CT. MIRTEC Corp is comprised of an extremely talented and knowledgeable team of sales and support professionals. With over thirty (30) sales and support centers located strategically throughout the continent, we are able to provide to our valued customers a full range of services including; consultation, installation, training, and after-sales support.

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